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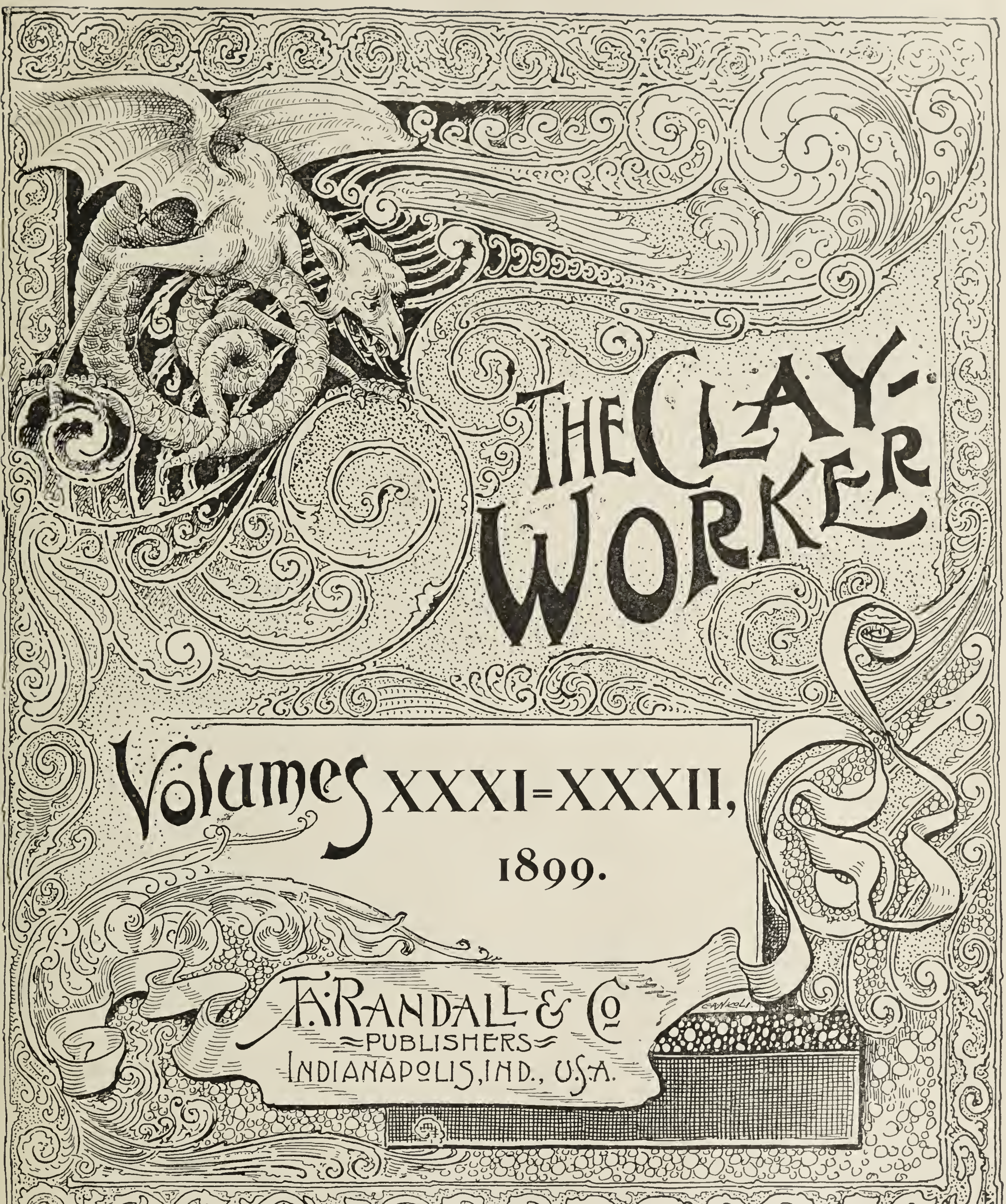

THE CLAY-WORKER

Volumes XXXI=XXXII,
1899.

T. A. RANDALL & Co.
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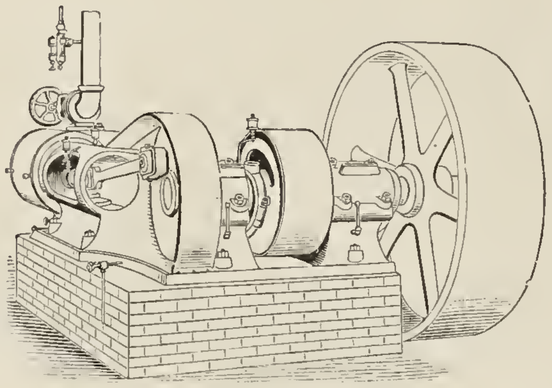

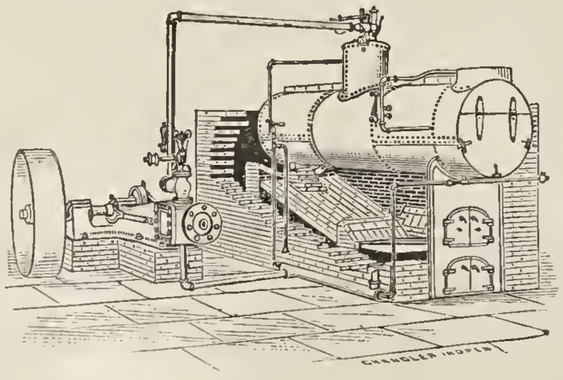

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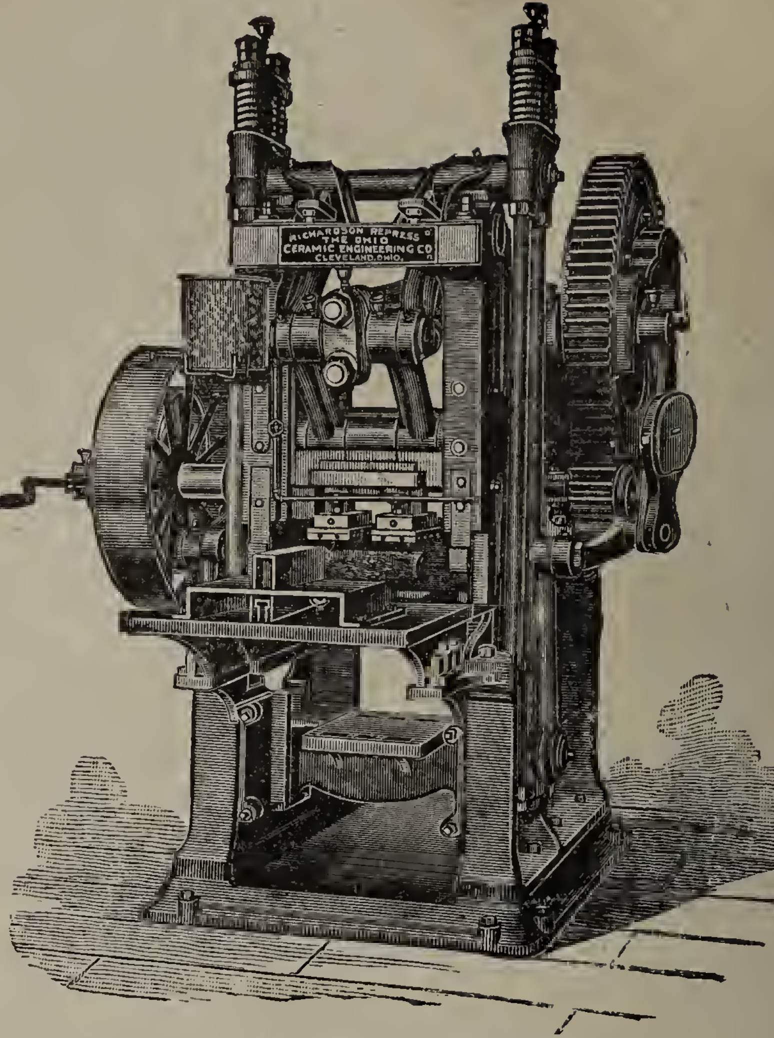

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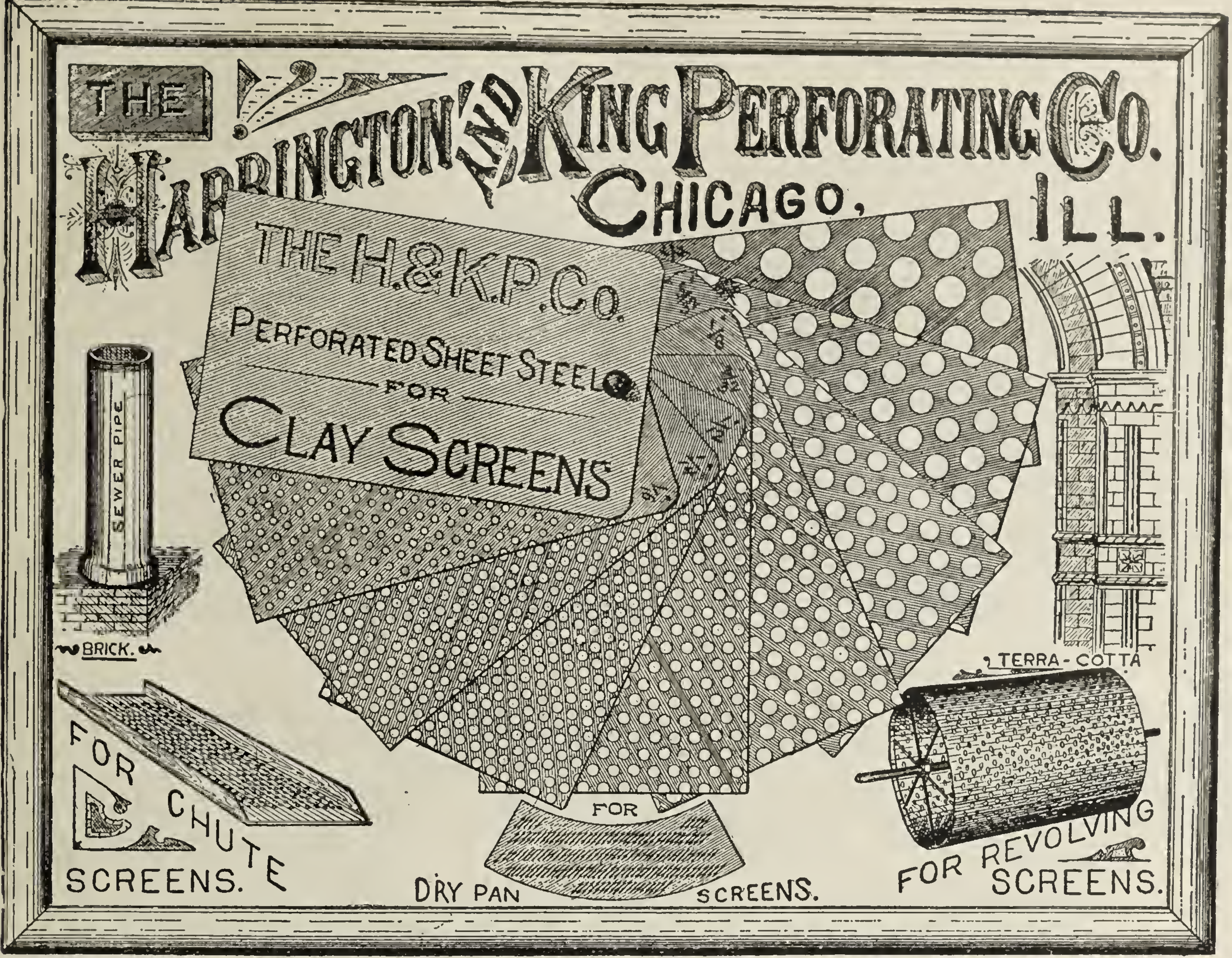
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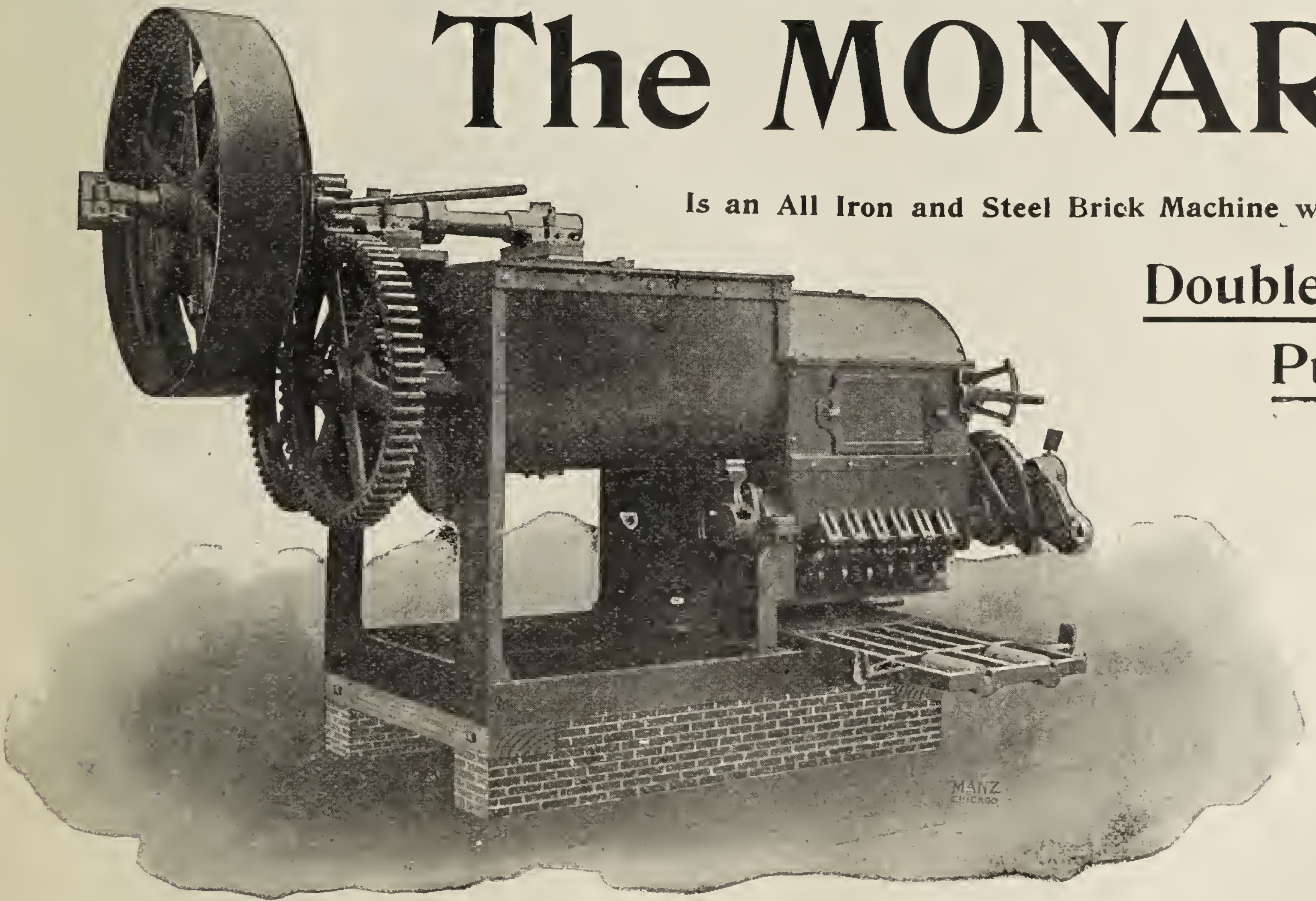

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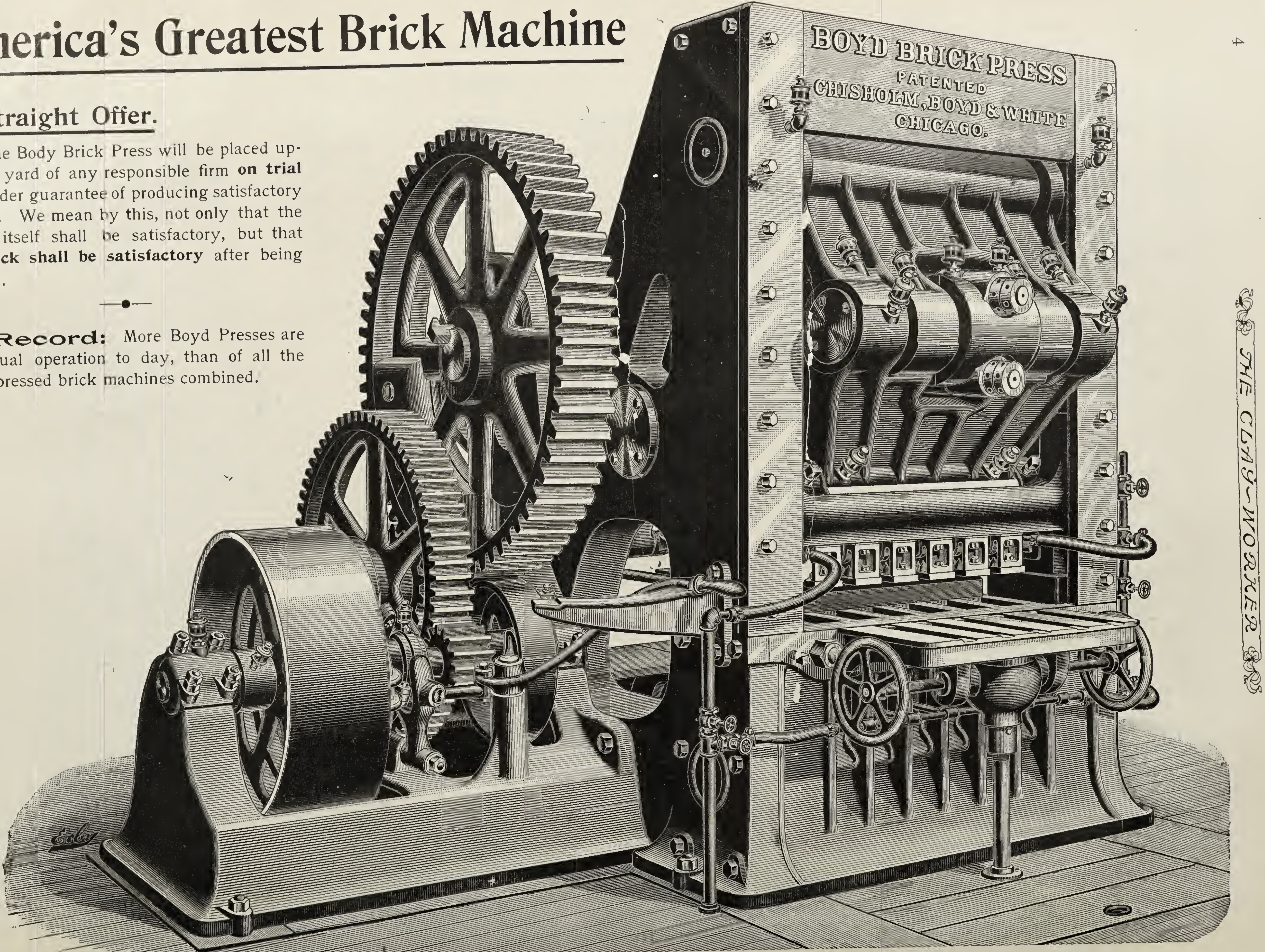

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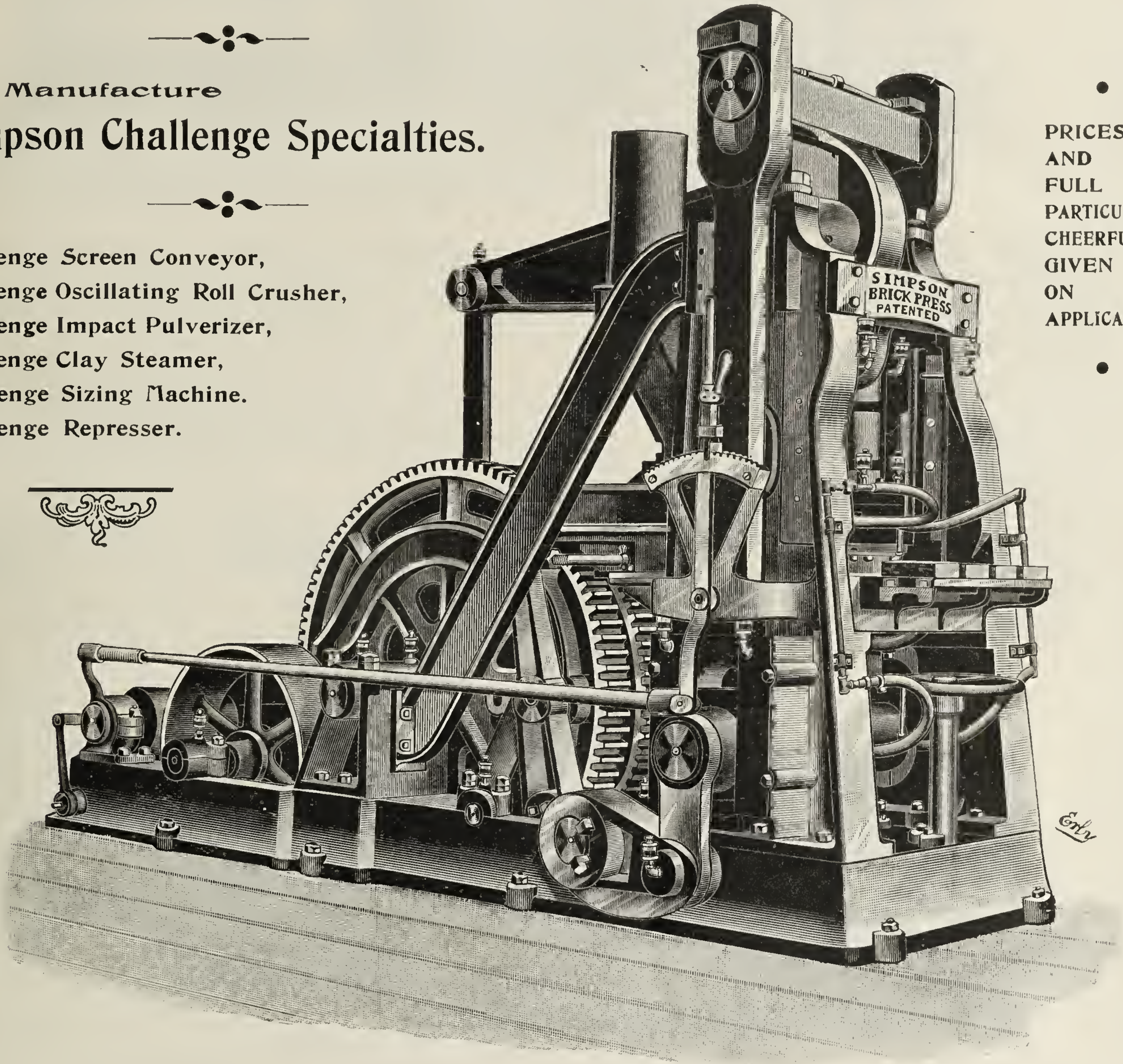

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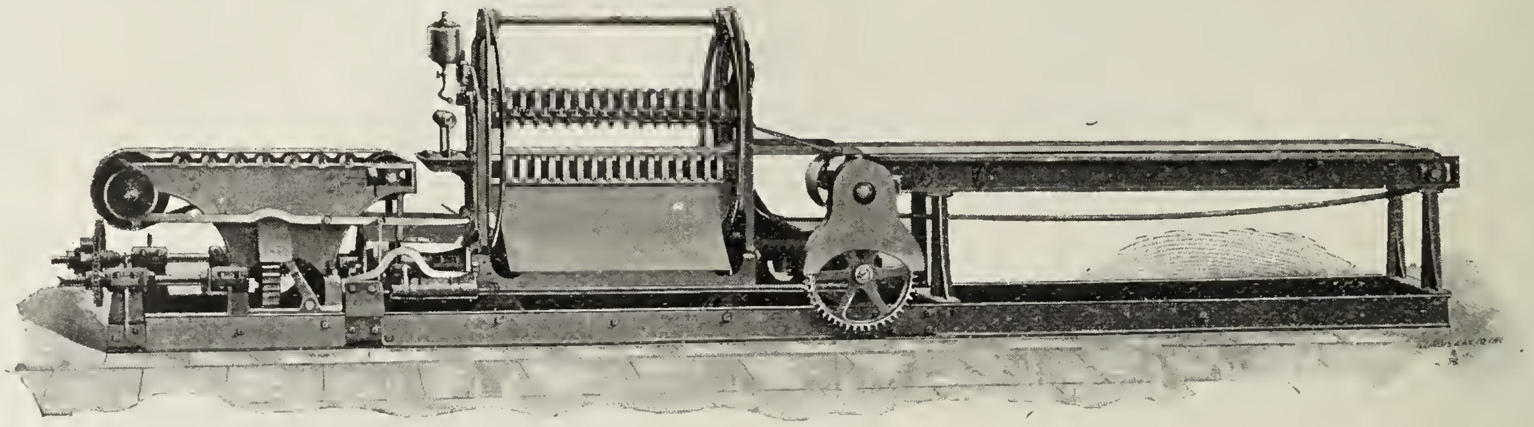

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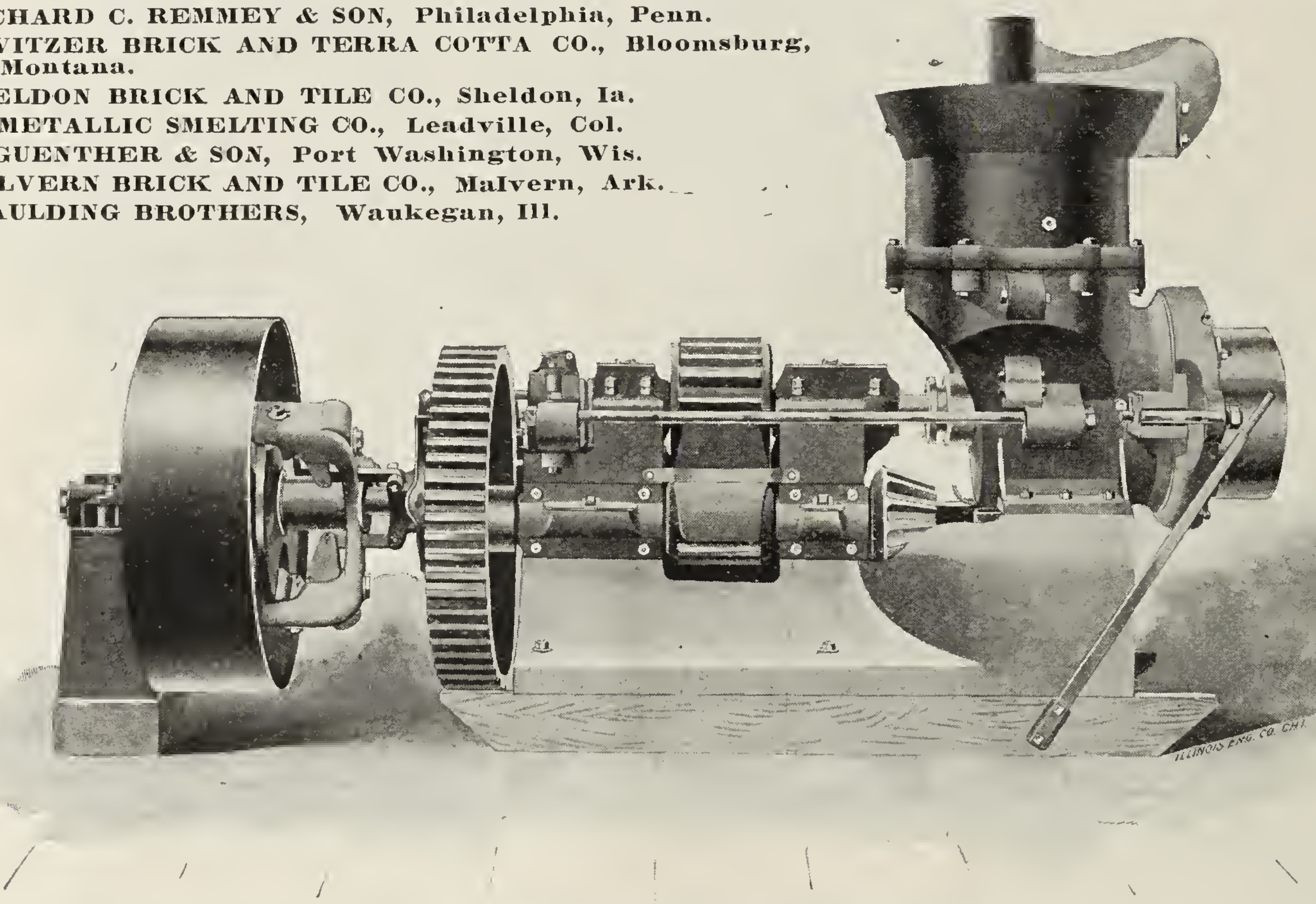

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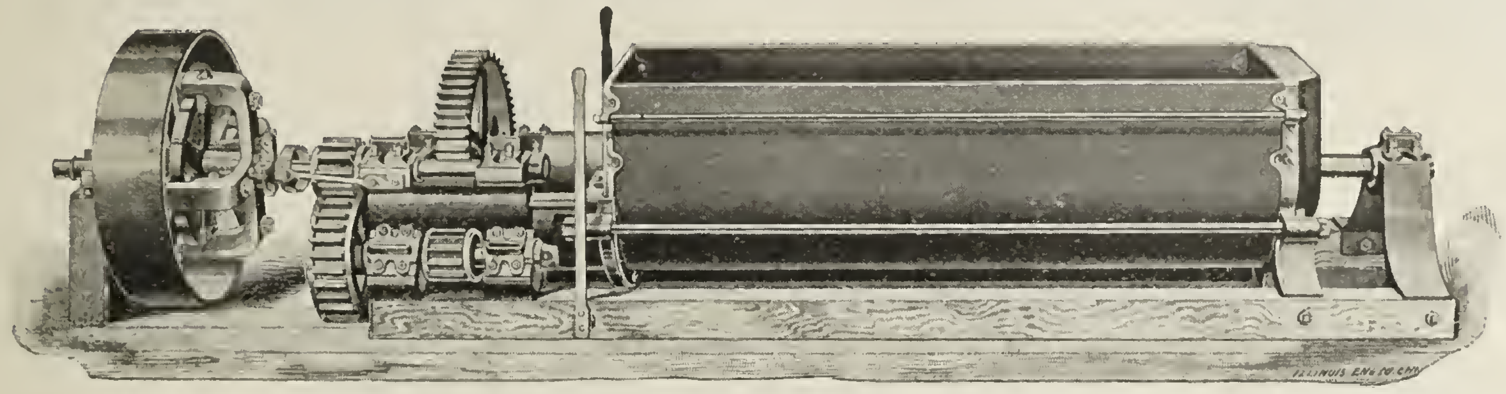
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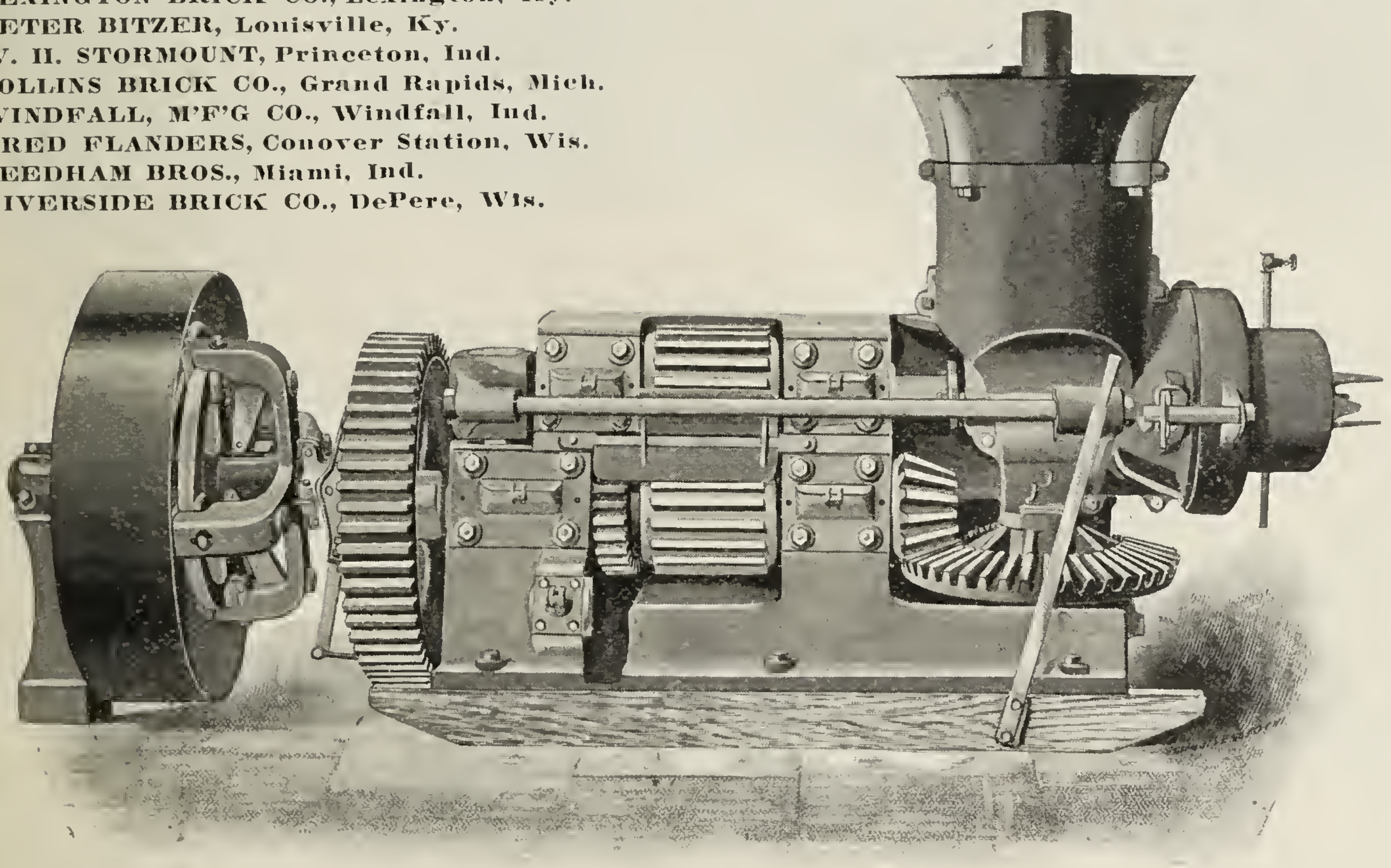

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IS THE KIND THAT COUNTS.

What a manufacturer says about his own product may sometimes be open to doubt. It would be a weak sort of man who didn't "stick up" for his own handiwork. But what **others** say—that's another story. We are willing that

The Standard Brick and Tile Drier

Should be judged by its record as made up by users. On this sort of testimony—the kind given below—"we rest our case."

Ensley Brick Co., Ensley, Ala.

Ensley, Ala., December 9, 1898.

The STANDARD DRY KILN CO.,
Indianapolis, Ind.

Gentlemen:—We are very much pleased with your Drier—it does even better than you guaranteed.

This is very gratifying to us as our first experience with Driers was very discouraging; in fact, a failure both as to drying and handling our material. The great mistake we made was in considering a proposition from and awarding the contract to a party who made us a lower price than yours, on our first Drier. In buying the second time we did not consider a bid from the first builder at all. Now we see the difference. There is no comparison between the two Driers, neither in equipment, workmanship or system.

Respectfully,
ENSLEY BRICK CO.,
H. L. Finkler, Sec'y.

Indianapolis, Ind., Nov. 3rd, 1898.

The STANDARD DRY KILN CO., Indianapolis, Ind.

Gentlemen:—The eleven track Steam Drier you put in for us at our Martinsville plant has been in use nearly one year, during which time it has been subjected to numerous and trying tests. Beginning as we did in the Winter with the clay wet and sloppy, and the shale full of frost, our soft mud brick entered the dry house cold and clammy. Under the scientific yet common sense method of distributing the heat and nature's own way of carrying off the moisture, our brick came from the Drier, sound and thoroughly dried and free from checks or fracture.

We dry our soft mud shale brick in 24 hours and our brick made from clay in 48 hours. The Drier is easily controlled, in fact it runs itself with no expense so far, for repairs or renewals; all that is required is steam sufficient to keep the temperature at 120 degrees at the receiving end, and about 165 degrees at the discharging end.

The cars we purchased of you with Cage Roller Bearings and well supported and braced steel racks, without doubt are far and away the best and most practical we have seen or tried. In fact the Drier with its outfit is to us an agreeable surprise, in the matter of durability, practical use and expense on account of repairs.

Yours very truly,
THE ADAMS BRICK CO.,
J. C. Adams, Pres't.

The STANDARD Is the Drier that does not disappoint. It invariably does all and a little more than is claimed for it. It satisfies in every instance.

Our Catalogue and much more "Unbiased Testimony" can be had for the asking.

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186 South Meridian Street.
INDIANAPOLIS, IND.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXI. INDIANAPOLIS, IND., JANUARY, 1899. No. 1.

Written for the CLAY-WORKER.

THE CONVENTION CITY.

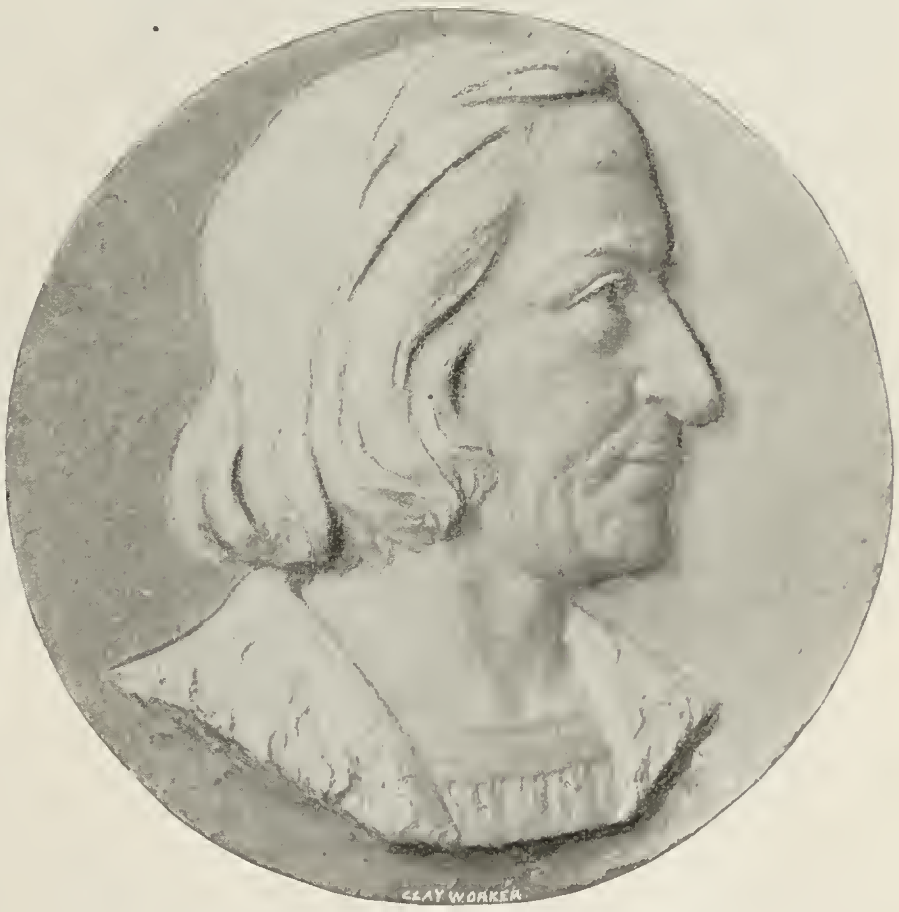
Some of the Many Attractions of Columbus of Special Interest to Members of the N. B. M. A. Who will Gather There February 7.

THE CAPITAL OF THE "BUCKEYE" State is just now the mecca toward which the eyes of the brickmakers of the nation are turned, and soon the annual pilgrimage thither of the faithful will begin. Those of our readers who have never visited Columbus will find much there to interest and entertain them. The seat of the State government, it is naturally the home of many public institutions, chief among them being the Ohio State University, which for many years has ranked foremost among the great educational institutions of the nation. The establishment of the school for clayworkers as a regular department of the University gives it special importance to our readers. Those who attend the coming National Convention, Feb. 7 to 10, will be given an opportunity to visit the University and inspect such special departments as they are most interested in. The Board of Directors will keep open house, as it were, convention week, and, with the assistance of Professor Orton and his pupils, will show every attention possible to the visiting clayworkers.

—Columbus's New Railway Station.—

Arriving at Columbus, the first thing to take one's attention is the new Union Station, a splendid structure, the main features of which are products of the clayworkers' art. It is unique in that the waiting rooms, ticket offices, restaurant, etc., are built high above the level of the tracks. Leaving the cars one must ascend one of the several broad stairways, some twenty or thirty feet in height, to a bridge-like passage way that spans the tracks and leads to the main entrance of the station. Passing out through the spacious and beautifully decorated waiting rooms into a cement-paved passage way, along the border of which are lined the usual 'busses and carriages, we are greeted with the familiar clamor of "Cab! Cab, sir! Cab to any part of the city?" but we have been there before, and pass them by unheeded, knowing that but a few steps beyond, at the end of the covered passage, is waiting a comfortable trolley car that will land us in front of the Great Southern Hotel more quickly than the cab, and for just a nickel.

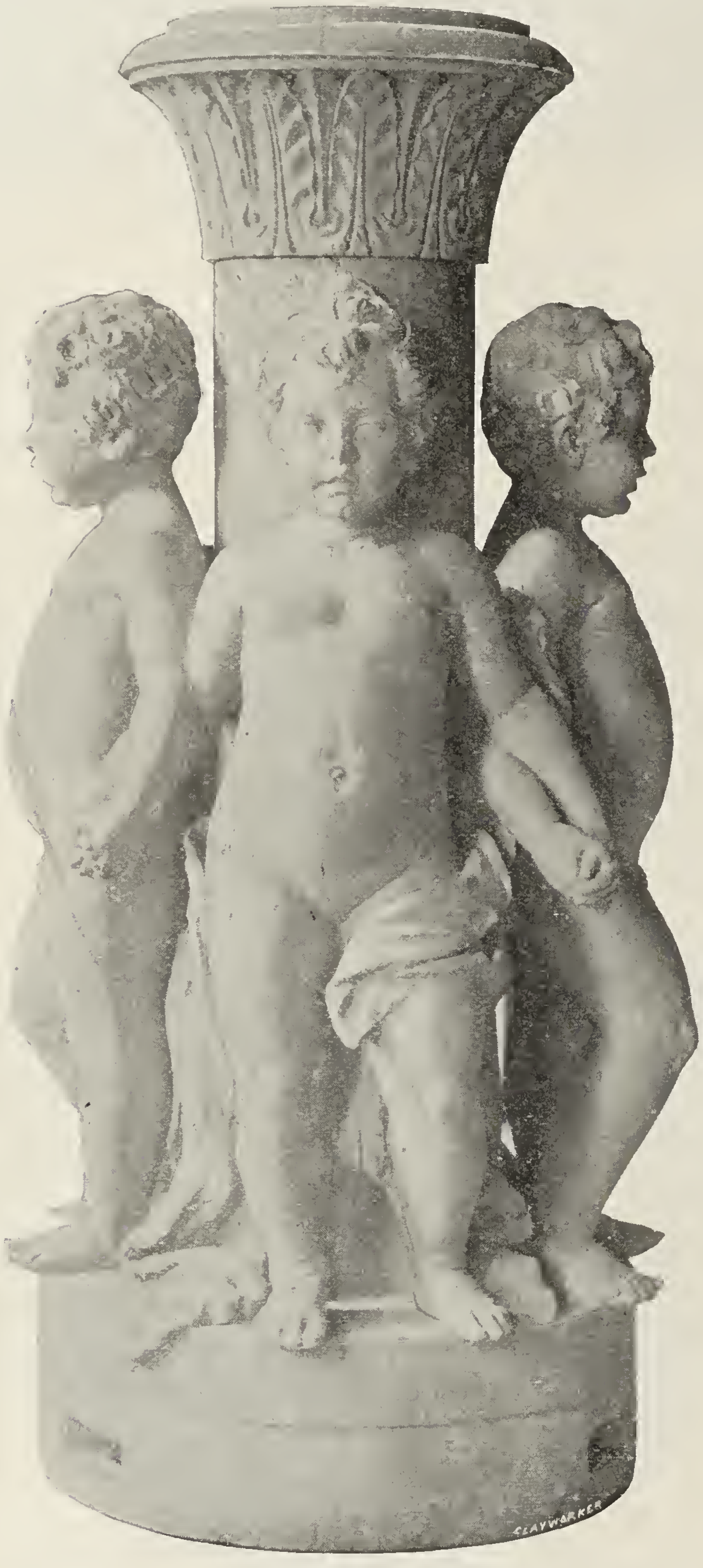
Before boarding the street-car, turn and look at the approach to the station, and your first impression of Columbus will be a favorable one, for it is a splendid specimen of modern architecture executed in buff terra cotta. The accompanying illustrations give but a faint idea of the excellent work which is a standing monument to the skill and art of the designer and builder. Clayworkers may well view it with pride and gratification. Step into the street car, first asking the conductor if it goes past the Great Southern Hotel (there is one line which does not), and in a few moments you will stand before another monument of the clayworkers' handiwork, but of a different style. The Great Southern is a great brick structure, and as such contrasts strongly with the station, which is largely of terra cotta. Each is admirable in its way. The Great South-



MEDALLION OF CHISTOPHER COLUMBO.
Executed in Buff Terra Cotta for Union Station, Columbus, Ohio, by Northwestern Terra Cotta Co.

ern is built of ordinary red brick, with but little terra cotta, shape-brick forming the chief ornamentation.

Columbus now has a population of nearly 200,000 people. There are vast mining and manufacturing interests all about her, while the surrounding agricultural territory is of remarkable fertility. It is estimated that there are a half million busy, prosperous people within a radius of fifty miles of the city. Fifteen or more railway lines run 120 passenger trains daily to and from this beehive of industry, carrying a burden of human freight that passes comprehension. Columbus is essentially a brick city, as its business blocks, residences and brick paved streets will testify. A study of its residence streets, representing houses of moderate cost, will surely pay every brickmaker.



Base of Flag Staff on Union Station. Executed by Northwestern Terra Cotta Co.

—The Ohio State University.—

The capital city's best known attraction is the School for Ceramics at the Ohio State University, since every clayworker has heard more or less about that institution. Hence as a matter of course we will not fail to visit the college, so that we find ourselves boarding a High Street car northward bound. After a fifteen minutes' ride we enter the grounds, and we see before us a broad tract of land with some acres of virgin forest to the right. Scattered over the campus are the college buildings, about fourteen in number, presenting even now, though the great trees are denuded of their leaves and the park-like meadows have lost their refreshing green, a noble appearance upon the wintry background. Yes, all this work, though by no means complete, stands for the higher education of the young men and women of this great commonwealth, an acknowledgment by the State of the great benefits derived from education, increased intelligence, usefulness and happiness.

Towering up before us there stands a massive brick building. A martial spirit seems to pervade the edifice from the defiant battle towers down to the heavy portals. Indeed, the building is a grand specimen of brick architecture, unique in design and execution. The brick are of a flashed dark red, with a peculiar dead gloss and the color seems to match the expression of the building to perfection. We might guess the use of this building from its very appearance; it is the armory and gymnasium. The rules of the University require every male student to be instructed in military drill and tactics three times a week during the first two years, and on drill days several hundred young men may be seen marching to the lively strains of the band. Surely the physical training in the modern college is not neglected. The gymnasium contains all modern apparatus for assisting physical development, baths, etc., with a hall large enough for drilling several hundered men.

On we go on a smooth cement sidewalk to the next building, Hayes Hall, an imposing red brick and brown sandstone structure. As we pass under the fine stone arch spanning the main entrance we hear the whirr of machinery. We have not been deceived, for we find here a well furnished machine shop, containing modern machine tools of all descriptions, from the planer down to the drill press. That the work done by the students is not play can readily be determined by examining the products made, among which we see parts of machinery with true surfaces and fit, tools, brass fittings, etc. Adjoining the machine room is the blacksmith shop with twenty forges, for which the blast is furnished by a Buffalo pressure blower, the smoke being likewise exhausted by a fan. To the right there has been equipped a foundry with a Callian cupola, brass furnaces, core oven and the necessary tools. On the second floor the art of wood working is practiced in a large carpenter and pattern shop, equipped with carpenter benches, turning lathes, planers, circular saw, etc. The balance of the building is chiefly devoted to instruction in free hand, mechanical and architectural drawing. Large, well lighted rooms are provided for this purpose. From an examination of drawings made by students it is evident that instruction in this branch is of the most thorough kind. Photography, whose application is daily growing in importance, especially with reference to technology, receives a good deal of attention in the drawing department. For several of the best accompanying photographs the writer is indebted to the kindness of Prof. Bradford and Assistant Professor French, instructors in drawing and architecture.

But we must not tarry too long in one building, since there is so much more to be seen. The next building along our path is Chemical Hall, built of red pressed brick. A heterogeneous odor reminding one of all sorts of chemicals and drugs greets us so that no doubt exists in our minds as to the use of this building. Chemistry here is the predominating science. We find it in all its aspects, theoretical and practical. One department is devoted to metallurgy, to the analysis and assaying of all kinds of ores and minerals in connection with mine engineering. In other divisions general qualitative and quantitative, organic and inorganic chemistry is taught.

Leaving this hall of the mysterious science we proceed to

University Hall, the largest and oldest building on the campus, the nucleus of the present institution. It is built of red brick, with stone trimmings. It forms the stronghold of the old and modern languages, mathematics, history, physics, philosophy and political science. The college of arts and philosophy has its home here. University Hall also contains the executive offices and, last but not least, that important feature of college life, the chapel.

But we must resume our tôur of exploration. Upon entering a plain brick building immediately behind the main building we are again within the domain of the engineering sciences, in the mechanical department. This building is furnished with a great many machines and appliances for testing and measuring the power and efficiency of engines, for determining the crushing and breaking strength of materials and for all sorts of work pertaining to mechanical engineering. All kinds of steam, gas and water motors are represented, all provided with means of testing and adjustment. Steam engines harnessed up for brake tests and indicator practice, puffing gas engines, pumps of all descriptions, turbines and what not are ready to be studied by the young mechanical engineer.

Next to Mechanical Hall we notice an unassuming brick building, the electrical laboratory. Suffice it to say that it contains various types of dynamos and motors, lights of all descriptions and the necessary testing apparatus.

Bringing up the rear of this group of buildings are the boiler and power house. A few figures will perhaps show the requirements of this University in regard to power, heat and light. Three batteries of water tube boilers, fitted with self-feeding furnaces and having an actual capacity of 750 horse power, supply steam for power and heating purposes. In the power house two engines of 200 and 65 horse power respectively, convert the energy of steam into that of electricity. All the machines in the various buildings are driven by electricity transmitted from the power house and, of course, the current for all the lighting comes from the same source.

Again we resume our journey and stop before a large gray brick building with terra cotta trimmings and a cherry red tile roof, a fine looking building, indeed, plain, yet imposing. The entire structure, Townshend Hall, some 260 feet in length, is devoted to agriculture. It presents the modern phase of scientific agriculture so nobly begun by Justus von Liebig, the great agricultural chemist. The laboratories for the physical and chemical examination of soils, seeds, etc., are equipped in the best possible manner. Of special interest to clayworkers are the extensive dairy laboratories, whose walls are lined entirely with white enameled brick, the floor consisting of vitreous tiles. The building is of slow burning construction throughout. Townshend Hall certainly is an eloquent witness to the height to which agriculture has been raised by science.

Turning our steps eastward and passing two red brick structures devoted to horticulture and botany, we finally arrive at the mecca of our pilgrimage, Orton Hall, in which the ceramic department is located. It is not a clay structure, being built of sandstone, but it is beautiful nevertheless. On entering the building the magnificent vestibule demands our admiration. It is a poem in stone, a geological allegory, telling the story of the Ohio rocks in the most powerful manner. In order to reach the ceramic laboratory we must descend to the lower regions of the building, since part of the building is occupied by the library, the geological and palaeontological museums, lecture rooms and laboratory. A scene of activity presents itself to us. Amid the din of ball mills and the rumbling of the "rattler" a group of young men are busily engaged upon various tasks, verifying and proving by actual work theoretical principles. Hard at work, guiding and directing and never idle we find the director and founder of this department, Prof. Orton, Jr., who, at least by name, is known

Approach to Union Station, Columbus, Ohio. Executed in Buff Terra Cotta by Northwestern Terra Cotta Co., Chicago.

to almost every clayworker of the land. We surprise him attired in, well, in overalls, which bear strong evidences of hard usage. A professor in this sort of attire certainly does not put on much style. It is needless to say that visitors, especially those of the clayworking fraternity are heartily welcomed.

—Prof. Orton's Faculty for Hard Work.—

Those that know him well say that Prof. Orton actually delights in undertaking work requiring the very hardest physical and mental exertions. This example is bound to stimulate the students to earnest endeavor, as is proven by the diligence shown in all their work. The enthusiasm which the professor brings into the school is likewise contagious and the student who has acquired this love of his profession and who is willing to work hard for success is certain to arrive near the goal in his life work. There is not a set of harder working students in the University than the boys of the ceramic department; early and late they are at work in their zeal to master the foundational principles of the art of clayworking. Chemistry being the key to the understanding of many phenomena occurring in ceramics, we are not surprised to find students bending over steaming caldrons and blazing flames

OHIO STATE UNIVERSITY BUILDINGS

acquiring a knowledge of the chemical structure of clays by means of the gross and rational analysis. Likewise the chemistry of cements, glazes and glass is thoroughly mastered as well as the principles of technical gas analysis. In a room divided from the laboratory by a glass partition the assistant has his den, filled with chemical apparatus of every description.

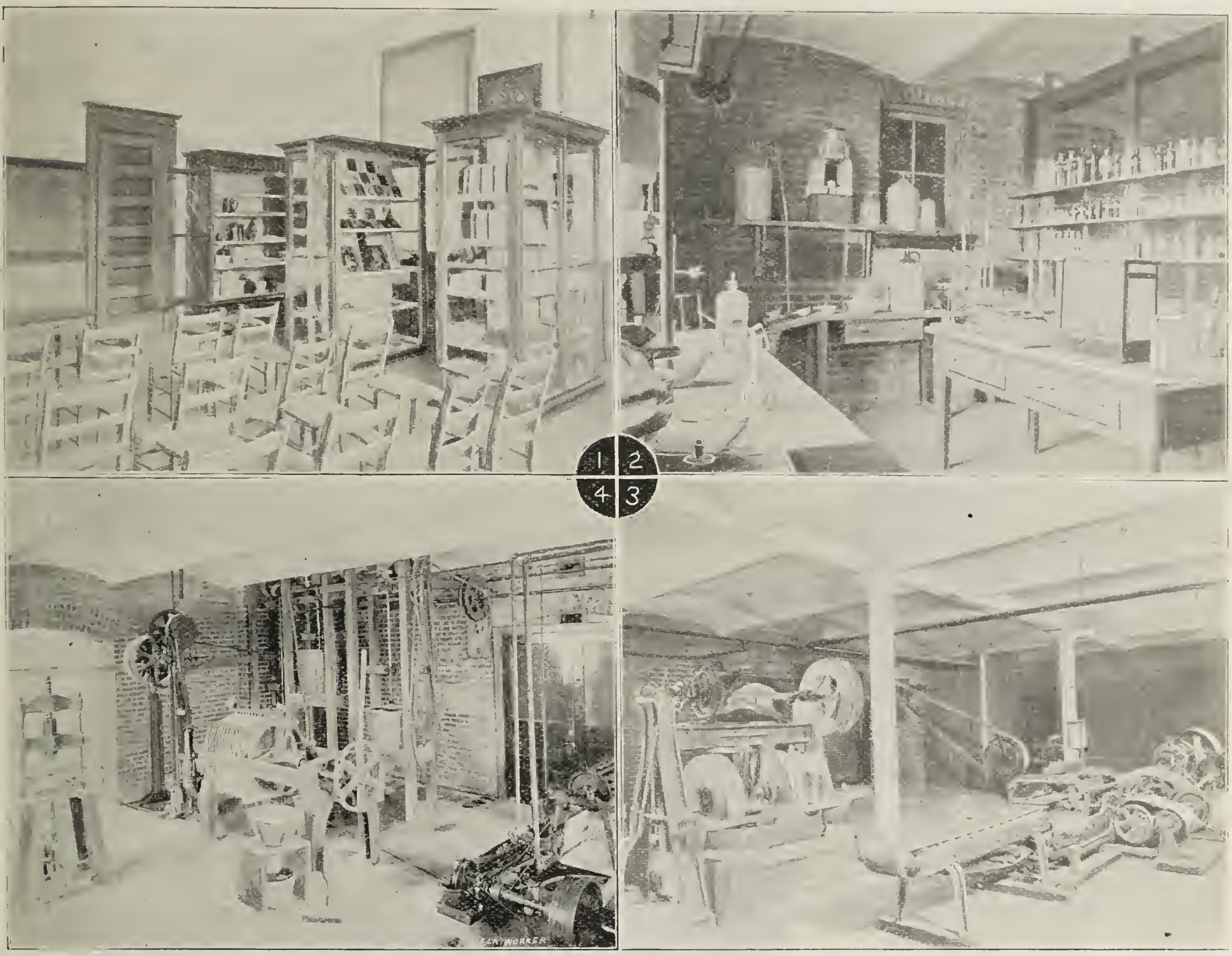
—Where Theory and Practice Go Hand in Hand.—

Considering the present limited space into which the department is crowded, the mechanical outfit is fairly complete, including a fine electric motor, dry pan, pug mill, auger machine with automatic cutting table, repress, plungers for pottery bodies, ball mills, filter press, potter's wheels, fan for blowing gas into small test furnaces and the standard brick rattler.

In a brick structure behind Orton Hall the kilns have been put up. There are two of them, one a down-draft, the other a muffle kiln. For the testing of glaze, making of fritts, etc., there are two small gas furnaces.

The work of the students is both theoretical and practical. Part of the time is devoted to the theoretical consideration of ceramics. The largest part, however, is given to the practical application and checking of theoretical conclusions and chemical practice. For instance, a clay after being analyzed chemically is separated into its mineral parts by the mechanical analysis and microscopic examination. The shrinkage, bonding power and plasticity are determined and finally a burning test is made. During the burning the rising of the heat is watched by means of an electric pyrometer and Seger cones, the loss of combined water, carbonic acid and other volatile matter is carefully determined and various other observations are made. The subject of pyrometry is carefully taught, the making of pottery bodies is practiced as well as the coloring of bodies and glazes, and the manufacture of brick and higher grade ware is discussed thoroughly. The theory and application of glazes is by no means neglected.

In addition to ceramics the two-year students are taught mathematics, physics, general chemistry, mechanical drawing, shop work and geology. The four-year students also receive instruction in the higher mathematics, German, mineralogy, rhetoric, university physics, mechanics, surveying, metallurgy, advanced chemistry and photography.



CERAMIC DEPARTMENT O. S. U.—1. The Class Room. 2. A Corner in the Chemist's Laboratory. 3. Brickmaking Machinery. 4. Clay Preparing Machinery.

It is astonishing how much is accomplished with limited means in the department of ceramics. The latter certainly deserves the support of all American clayworkers. In establishing a scholarship the N. B. M. A. has given evidence of the progressive spirit which pervades the association and there is no doubt but that the investment will always be a profitable one. The present incumbent, Mr. Purdy, is hard at work upon this year's investigation.

But time has passed rapidly and we must leave. After having sampled the delicious water of the crystal-like college spring we return towards High Street, but not without feasting our eyes upon another college building, Biological Hall, a splendid example of modern polychrome clay architecture. The ground color of the walls is a terra cotta shade from which buff terra cotta trimmings stand out in pleasing contrast. The roof is of red tile.

—From College to Brickyard.—

Following the natural course we will leave the school and enter the brickyard. Columbus has a number of building brick plants, while within a few miles of her borders there are several extensive front brick, paving brick and fire brick works, but there is only one press brick plant within the city limits, that of the

Works of the Fish Press Brick Co. Rear view.

FISH PRESS-BRICK COMPANY,

Leaving the High-street car, at the corner of High street and Fifth avenue, one needs to walk east but a half mile before reaching the plant of the Fish Press-brick Company. Its fine location in the city was one of the first thoughts that came to the writer's mind when he, by accident, first saw the plant. It is in that part of the city which at present is growing the most rapidly, with railroad and paved streets along the side of the yard, making hauling to any part of the city easy in all kinds of weather.

Thinking it best to follow the processes of manufacture consecutively, so as to have a systematic idea of the plant, we first went to the clay bank. The bank at present is about 150 yards from the factory, the clay having been taken out. There we found them working a twenty-foot face of blue shale, using dynamite where necessary, but a crowbar generally. There the clay is mixed with the shale and shoveled into dump carts. These dump carts are drawn by horses that need no driver. They travel from the bank to the dry pans, backing up to each to be loaded and unloaded as nicely as though they had a surly driver to pound and pull them about. On questioning, we found that a week, with the kind treatment that prevails in the yard, sufficed to teach a horse his little part in the work of brickmaking.

Following one of these carts around the office to the rear of the factory, we found ourselves in the basement before three dry pans, two of which were nine feet in diameter and the third eight feet. Into each pan three men were shoveling the clay, where it was moistened with the required amount of water.

From the pans the clay is carried by bucket elevators to the shaking screens on the second floor. The tailings are carried back to the dry pans through chutes, and the finer particles to the receiving bins. Under each of the three screens are stationary troughs or chutes, which conduct the clay to the mouth of the chute leading to the presses below. In the bins a considerable quantity of clay is stored for use in case of delays at the dry pans.

Climbing down from that noisy place, we came to the first floor, where we found three double Whittaker dry presses and one single one. While watching the young men as they took the bricks from the press we noticed that now and then they rejected a brick. Picking one up, we could not see at once the small flaws or cracks that the trained eyes of young fellows had seen, but we soon learned that at a glance they detected the flaws and rejected the bricks, stacking only sound brick on the wheelbarrows.

From the presses the brick are wheeled to the big fourteen-chamber Radford continuous kiln. The chambers are each 20x20x13 feet, with solid arches running length-wise of the chamber, having a capacity of 23,000 each.

After watching the setting of the green ware a little while, we went up on top of the kiln to visit the burner, Mr. South. There we found a big, jovial Englishman, who welcomed us heartily. His father was the head burner for Whittaker in England, and he had followed his father's footsteps. In England Mr. South had burned a similar shale to that found in this yard, which accounts for his present success.

We wandered over the kiln, opening holes here and there, watching the progress of the fire as it slowly creeps around the big kiln. We found two chambers on full fire at once, so that there were two open at the same time, one from which they were drawing and one in which they were setting the green ware.

Fish Press-Brick Co's Clay Bank—A Driverless Horse.

Through the center of the kiln a big flue connects with a "T" flue, conducting the waste gases to the tall chimney. From this big central flue small flues project out on both sides, running along the side of each chamber. At the extremity of these small branch flues are small chambers, in which a damper is so arranged as to control the draft during watersmoking.

After leaving the continuous kiln we wandered through the six New Castle kilns, which are not in use just now. They are all 15x30x15 feet, having a capacity of 35,000 bricks each.

Before leaving the yard we had the pleasure of meeting the Superintendent, Mr. Charles F. Harrison, who was very courteous and cordial. He talked freely about the plant and its prospects. He showed us the almost empty stock yard as a proof of the big business which they have done the last season. The yard has been running on full time, and yet had to refuse orders. It will take them a good share of the winter to refill their stock yard.

When running full time and capacity they can make 40,000 bricks a day and employ fifty men. Such a plant, with its hustling Superintendent and his excellent force of men, its central location in the city, is sure of a bright future. They have plenty of clay left in their bank at the factory, and in North Columbus, near their old works, to insure them many years' run.

OBITUARY.

James Taylor, a Pioneer Terra Cotta Manufacturer and Writer.

James Taylor, a clayworker of world-wide reputation, a resident of Port Monmouth, N. J., died at his home on Saturday, Dec. 24, in the sixtieth year of his age.

Mr. Taylor was born in England and came to this country in 1870, locating at Port Monmouth, N. J., purchasing a small farm from the Rev. W. V. Wilson. Previous to his coming to this country he was engaged in the architectural terra cotta business, and can be truthfully said to have been the pioneer in the manufacture of terra cotta on this side of the ocean, and his work in almost every city is a testimony to his skill.

A wife, three daughters and one son survive him. Two of the daughters are married, one being the wife of Chas. H. Walling, of Port Monmouth, and another of A. G. Waldecker, of Long Island City, now in the borough of Queens, New York city. The other two are Miss Edith H. Taylor and Arthur, who has just celebrated the fourteenth anniversary of his birth. Mr. Taylor also leaves three sisters and one brother.

Mr. Taylor, while in poor health for several years, was seriously sick but a short time, and his end may be said to have been sudden and unexpected. He was buried Tuesday, Dec. 27, with full Masonic honors, and also with the ritual of the Sons of St. George, to both of which societies he belonged.

Tribute to the Memory of James Taylor.

Friend Randall:

Your letter announcing the death of our friend and brother, James Taylor, to hand, and noted with deep regret and sadness. It seems hard to realize that the brother who was so healthy and energetic at our last Convention should be "still in eternal sleep" before the recurring meeting, now close at hand, leaving a gap that must be forever a gap. We each have our individuality, each our characteristic traits, which are prominent whether we will or no, and which fit us for some particular duty or position. These live with us, and die when we die; we can neither bequeath or assume. Therefore, I say that the place held by our late brother in our hearts and minds is a gap that can never be filled, but held sacred to his memory. It can truly be said that he was a brother in the noblest sense of the term, having a brother's kindly feeling for others who were not so fortunate as he in the possession of craft knowledge. Advising or admonishing, rejoicing or sympathizing, he was always himself, without varnish or gilding, one of nature's gentlemen. His friends are not confined to members of our Association, but are numbered in the vast army of clayworkers of every section, who, although for many reasons do not attend our Conventions, yet are eager readers of the report, and follow the proceedings and discussions with deep interest. All of these knew that his words were honest and sincere—knew this by their "ring"—but they could not know, as we do, his sterling personal qualities. He was conscientious to a degree, and possessed of a magnanimity that commanded respect even from those who held contrary opinions. It has been my pleasure to know him for years, and I feel I cannot do justice to his many good qualities at this time, but am confident in the belief that he has left monuments to his memory that will act as incentives to succeeding generations of clayworkers.

J. W. CARSON.

The Vacant Chair.

Dear Randall:

Yours bringing the sudden news of friend Taylor's death carries me suddenly back a few months when my life was in the balances and he was extending such heartfelt sympathy. Of those who then opened their hearts three have now "Passed over the River." First, John McCain, whose memory is enshrined in the hearts of all who knew him, ended the long struggle, and passed to that land where pain and suffering is unknown. Then Joseph Jonier, whose quiet, unostentatious letter bore to me the warmth of his heart; a competitor, but a brother, passed to his reward. Always a lover of the pure and the beautiful, he has gone to that land that knows nothing but beauty and peace.

The Late JAMES TAYLOR.

And now the other pioneer, earnest, warm hearted and full of resource, for long years will we look at his vacant chair in our gatherings and sorrow that we can see him no more.

GATES.

Caleb Holyoke—A Pioneer Brickmaker.

There died in Brewer, Maine, on Wednesday morning, Dec. 7, a pioneer brickmaker, who had seen the brick manufacturing industry of his town grow from the one small brickyard, operated by himself to a prominence above all other New England towns, which position it held for years. Then he lived to see the town as a brickmaking center drop out of sight of the New England market, with but four yards in operation.

His name was Caleb Holyoke and he had lived a useful and eventful life of eighty-seven years. He died the wealthiest man in Brewer. His ancestors came from Warwickshire, England, in 1638, and settled in Salem, Mass. His grandfather John Holyoke, took part in the Boston Tea Party and after that historical event went to Maine and settled in Brewer on the land where this Mr. Holyoke lived and died. Mr. Holyoke had seven brothers and four sisters, all of whom save one are dead. All of the boys learned the trade of ship carpentry and for years Mr. Holyoke run a shipyard of his own. He began making bricks in Brewer in 1830 or thereabouts. His yard was close to the river bank and with the starting of that yard began a rapidly increasing trade with Boston. He helped build the first bridge across the Penobscot river (Maine's biggest stream) connecting Bangor and Brewer two cities that are now about to consolidate. In 1832 and 1836 he worked at his trade in New Orleans and from that began a trading career between Boston and Bangor. With him for many years was associated in business I. S. Johnson, of Johnson's Liniment fame. Mr. Holyoke was always interested in brickmaking, but often said that brickmakers were obliged to give two much weight for the money.

Seth C. French, no More.

Seth C. French, sole surviving partner of the firm of French & Winslow, stove-lining manufacturers, of Taunton, Mass., passed away this afternoon (Jan. 5, 1899), from an attack of pneumonia, at his residence in Taunton, Mass.

Mr. French was about seventy years of age, and had been, since 1870, associated with his brother-in-law, Mr. A. H. Winslow, in business until the latter's death last summer. He was a kind husband and an indulgent father, and was unusually respected for his strict integrity, but owing to his infirmity—deafness—was of very retiring habits. He leaves a widow and one son. His loss, like the death of every man of such unswerving integrity, will be felt in the community in which he lived. C. A. BLOOMFIELD.

ANNUAL MEETING OF THE NATIONAL ASSOCIATION OF STOVE-LINING FIRE-BRICK MAKERS.

Editor Clay-Worker:

The annual meeting of the Stove-lining Brickmakers was held on Wednesday and Thursday, Dec. 14 and 15 inst., at the Broadway Central Hotel, New York city. A goodly representation of those interested were present, among them being B. C. Peirce, representing the Presbrey Stove-lining Company, of Taunton, Mass., the pioneer works in this line of business; Messrs. John G. and Joseph Williams, of the Williams Stove-lining Company; Messrs. Brad French and Fred Burt, representing the firm of French & Winslow; Arthur Lincoln, of the Union Stove-lining Company, and Walter Parker, of the Taunton Stove-lining Company, all the above-named works being located in Taunton, Mass. There were also present Gideon C. Francis, of the Dighton Stove-lining Company, Dighton, Mass.; C. M. Helmer, of Hall & Sons, Buffalo, N. Y.; Mr. H. S. McLeod, of the McLeod & Henry Company, Troy, N. Y.; Benjamin Fox, of E. S. Fox & Co., Reading, Pa.; William Latshaw, of Rogers & Co., Royer's Ford, Pa.; Stephen D. Holton, sole interested partner of Horton & Mabie, Peekskill, N. Y.; W. J. Falls, of North East, Md.; H. A. Perkins, of the Brooklyn Fire-brick Works, Brooklyn, N. Y.; C. A. Bloomfield, of New York city, N. Y.; James Taylor, of Port Monmouth, N. J., and last, but not by any means least, Mr. Hyser, of the firm of Hyser & Lewellen, Philadelphia, Pa., and, in connection with him, I want to state that this gentleman is only lacking two months of being eighty-one years old, and is a very remarkable man, being in full possession of all his faculties, both mental and physical, attending to his daily routine of duties as well as others many years his junior.

The following officers were elected unanimously for 1899:

President—C. M. Helmer, Buffalo, N. Y.
Vice President—W. J. Falls, North East, Md.
Secretary—B. C. Peirce, Taunton, Mass.
Treasurer—John G. Williams, Taunton, Mass.

As you will see from the above list, New England and Pennsylvania were well represented, and at 2 o'clock p. m. on the 14th inst. the meeting adjourned to the private banquet hall, where the annual Association dinner was enjoyed by all present, who testified to the benefit and help derived from the assemblages of this Association, confirming all previous reports in regard to the great good it is doing for the trade as a whole, as well as to each individual manufacturer. In the evening the members formed a theater party given by Mr. Bloomfield, at the Academy of Music, to see "Sporting Life." A very prosperous year is looked forward to in 1899.

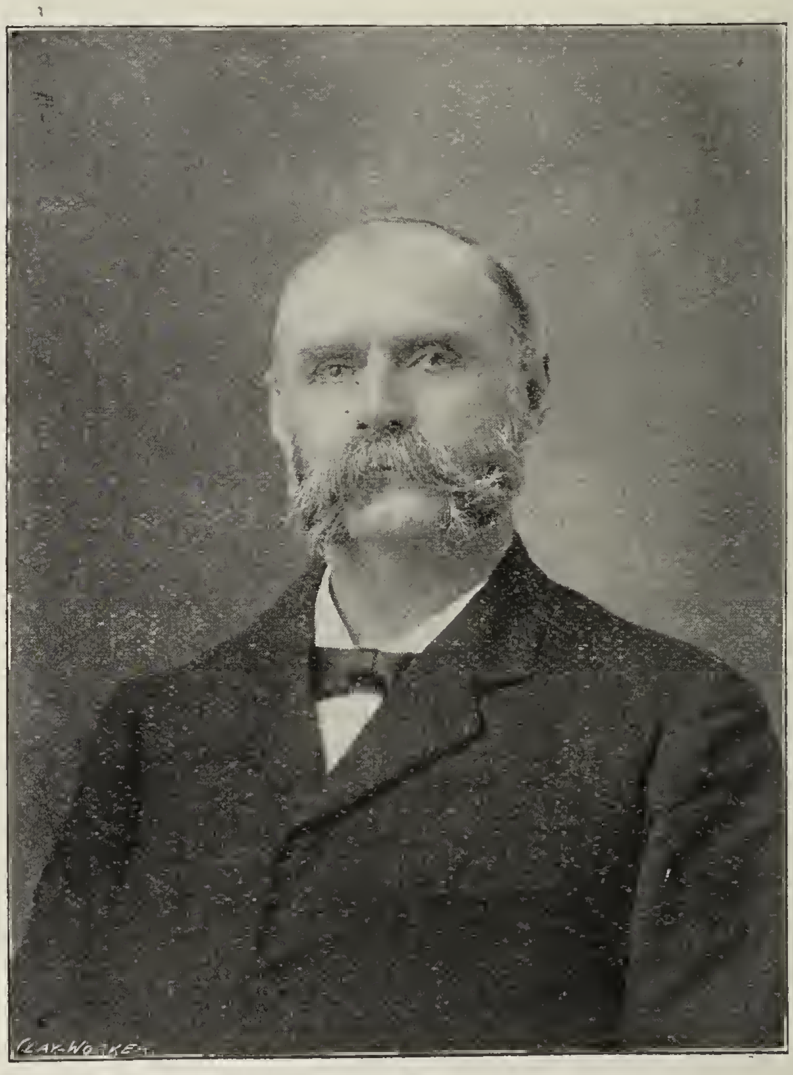
After the regular routine of business had been finished the following resolutions were reported and unanimously adopted:

"Whereas, It has pleased Him in whose hands are the issues of life and death to remove from our midst our friend and associate, Albert H. Winslow.

"Resolved, That we, the members of the National Stove-lining Association, mourn his death, and will ever cherish his memory as one endeared to us by his true manliness and strict business integrity.

"Resolved, That we extend our sincere sympathy to the family in their affliction, and that a copy of these resolutions be spread upon our records and sent to the family of the deceased." JAMES TAYLOR.

Dec. 19, 1898.



Secretary B. C. PEIRCE, Taunton, Mass.

AT CHICAGO.

Although we are now in the heart of the winter, an unusual volume of business comes to light every week, and much more is planned that has not yet been offered for bids. January and February will be very busy months among the architects and contractors bidding for work, and all predict that 1899 will be a record breaker in building operations throughout the Northwest. All indications point this way, and, if nothing unforeseen happens, 90 per cent. of the work on the boards this winter will go through.

A great many improvements, including much municipal work, will engage the attention of Chicago contractors. The present administration is in favor of brick for pavements, which has not been the case in the past. The Department of Public Works figures that from twenty-five to fifty miles of brick streets will go down this year.

A large number of paving brick are now being used by the various railroads in the work of track elevation, paving all their subways, which are very extensive. The brick used come from Galesburg, Veedersburg, Ind., Clinton, Ind., and some as far away as eastern Ohio. There are several prospective paving-brick companies organizing in Chicago to build plants to look after this trade. The size of pavers most in favor here is 9x4x3. As the editor of the Clay-Worker knows, no clay has yet been found within a radius of seventy-five miles from Chicago that will make paving brick, consequently the railroads get a good slice of the profits. CHICAGO.

PAVING BRICK IN JAMAICA.

THE BRITISH GOVERNMENT have sent expert engineers to the United States to examine into the quality and character of American paving brick. These officers have made extensive tours through the Eastern and into some of the Western States to see how the bricks were made, and also to ascertain by practical examination the most approved methods adopted in the construction of our pavements. They made one purchase of the Clearfield paving block, made in Clearfield county, Pa., and found it very satisfactory, and now they are loading five hundred thousand of the red shale paving brick, which they have bought from the Eastern Paving Brick Company, of Catskills, N. Y. These gentlemen were greatly interested in the various articles which have appeared in the recent issues of the Clay-Worker, and have tendered us their thanks for the information and help thereby given them in their undertaking, and expressed a desire to receive any additional instruction which may in future be published in our pages.

. Vice-President W. J. Falls, North East, Md.

The fact that nearly one million of American paving-brick have been purchased for paving the streets of Jamaica by the British government ought to be a source of gratification to our N. B. M. A. members, and an object lesson to our local engineers of highways. J.

Written for the CLAY-WORKER.

TESTING PAVING BRICK.

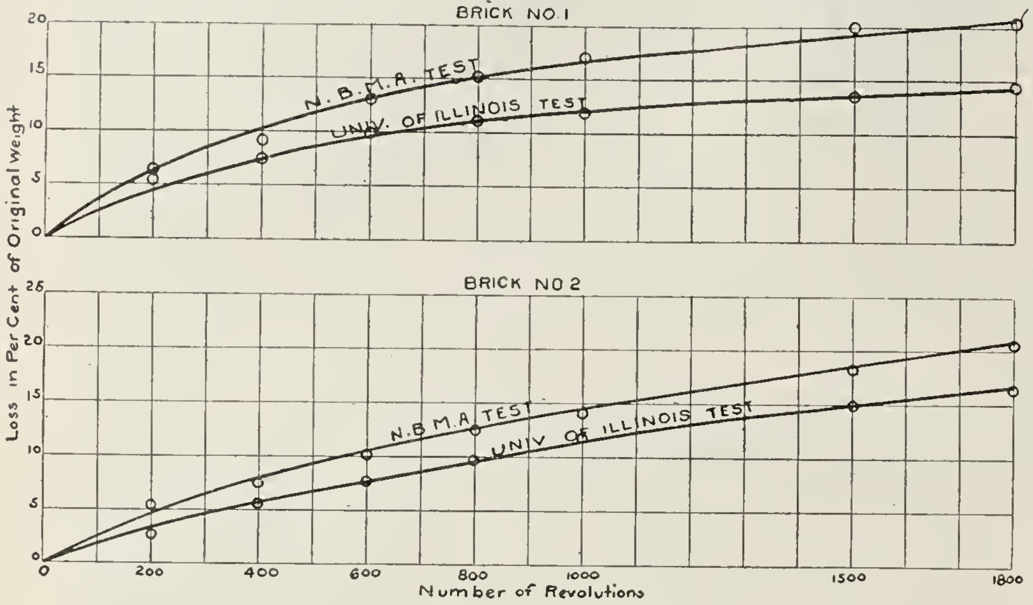
BY H. A. WHEELER, E. M.

PROF. A. N. TALBOT, of the University of Illinois, recently published a paper on testing paving brick that has been quite freely reproduced by the technical press. In this paper, which is based on tests made by him in the University laboratory, he comments quite freely on the work of the special committee on testing paving brick which was appointed by the National Brick Manufacturers' Association, and some of his criticisms are decidedly unfavorable to their work, which was completed by February, 1897. The accession of such new data as Professor Talbot presents is always desirable, and if he or others can show that the N. B. M. A. committee's work needs revision, it is a valuable contribution to both the brickmakers and brick users, as it is to the interest of all parties to have a thoroughly reliable, satisfactory method of testing paving brick. But, in view of the N. B. M. A. committee being composed of brickmakers, brick users and disinterested clay experts, being made up of both engineers and artisans, and as their labors extended over a year before the results were finally discussed and prepared for publication, their well-matured recommendations should not be hastily abandoned, especially in view of the experience and ability of the enlarged body which finally formulated their data. Contributions like Professor Talbot's, therefore, become of interest and call for special consideration. The subsequent comments are based on data presented in his paper, and the writer assumes no responsibility as to their accuracy.

Professor Talbot says that "the recommendations of the N. B. M. A. committee in abandoning the absorption test, and not recommending the cross-breaking test, will not be acceptable to engineers, and he presents Diagram 1 from his tests on thirty-five different paving brick as the basis for this criticism.

First, taking up the absorption test, we find, on studying the data presented in this diagram, that the absorption ranged from 0.2 per cent. to 5 per cent. in these thirty-five different brick. Comparing the absorption results with the rattler test, and assuming that the rattler is the best guide as to the value of a paving brick, to which Professor Talbot seems to assent, we find that the absorption test gave a correct idea as to the merits of the different brick in eighteen cases and was erroneous in seventeen. Further, that the brick (No. 35) that was the poorest as shown by the rattler made all but the best record in the absorption test, while two excellent brick made the poorest absorption records (Nos. 13 and 18). Such dangerously erratic results will not be indorsed by any engineer of sound judgment, and the abandonment of the absorption test as a scale of merit is peremptorily called for by Professor Talbot's idea if we desire reliable data, and not guessing. The fetish of ancient customs does not have that potency in the engineering profession that it has in law, and while engineers in the past may have laid great stress on this test, it is such facts as Professor Talbot and the N. B. M. A. committee present that have caused the abandonment of the absorption test in evaluating the wearing ability of different brick by progressive engineers. The writer, therefore, thinks Professor Talbot has presented additional data that strongly indorses the N. B. M. A. committee when they recommended that this test be discontinued. It is true that the absorption test has other values than for guessing at the wearing value of different brick, as for a given brick, when once it has been thoroughly tested, it can be used to show whether the clay has been overburned or underburned, though this data can be arrived at very much quicker and equally as reliably by the experienced eye and hand hammer.

As regards the cross-breaking test Professor Talbot's data shows a range of 1,300 to 3,300 pounds per square inch in the thirty-five different brick, which have an average value of about 2,400 pounds. Comparing this data with the rattler results, we find that it fails or is grossly misleading in thirteen cases, or 37 per cent. Further, that the best brick (No. 1) gives a very low, or all but the worst, cross-breaking record, while one of the poorest brick (No. 32) gives a very high cross-breaking record. In fact, the cross-breaking test only satisfactorily harmonizes with the rattler test in less than 30 per cent. of the series. Surely the abandonment of such an uncertain method of arriving at merit is a necessity, as guessing would be more reliable, and whatever other interest this test may have, it is entirely too unreliable and quixotic to be entitled to consideration by an engineer or scientist as a scale of merit in the wearing value for street paving, so that Professor Talbot's data again emphatically indorses the wisdom of the N. B. M. A. committee in regarding this test as so untrustworthy as to require its rejection in arriving at the wearing value of paving brick.



As regards the rattler test, Professor Talbot objects to the N. B. M. A. method because (a) it takes too many brick; (b) that too many brick are used to detect lack of uniformity if a general average is taken; (c) that if less than 15 per cent. are employed it affects the results too seriously; (d) that it does not sufficiently distinguish soft and brittle brick, as the impact effect is insufficient, and if this last objection is true, he regards it as a serious defect in the method, and one which calls for a revision if his work and conclusions are indorsed by other experimenters.

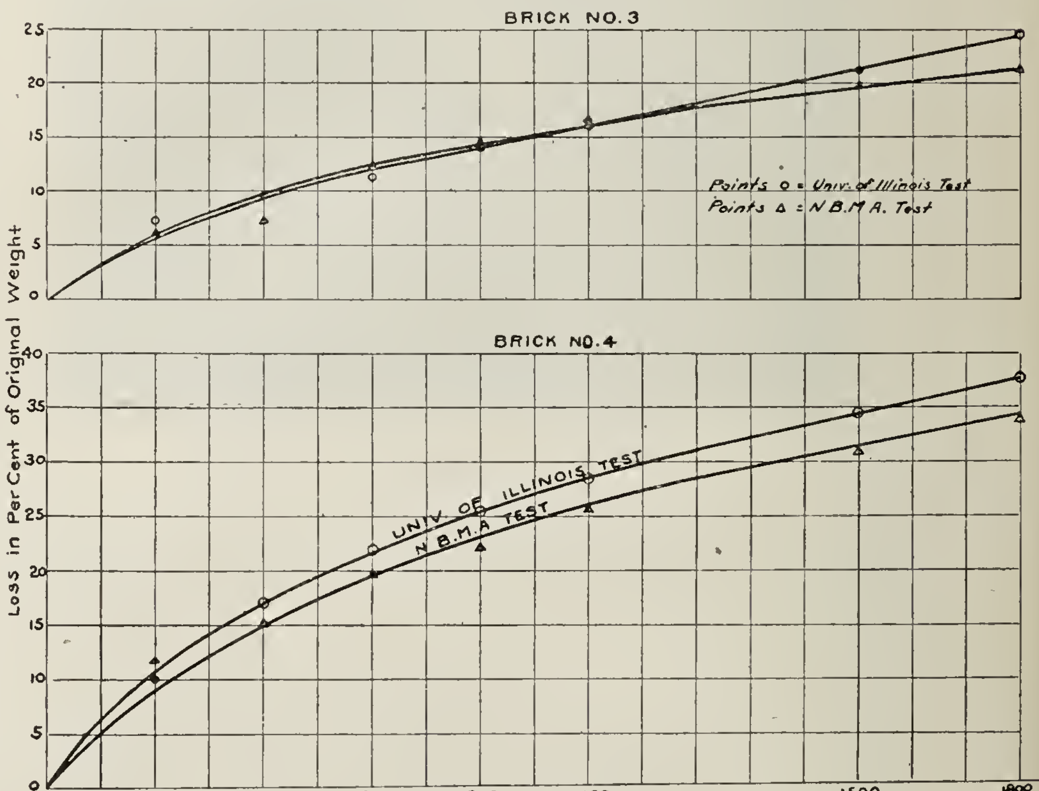
Taking up these objections in order, it is quite true that the N. B. M. A. method requires more brick than engineers have been in the habit of using in the past, when an average on five brick was supposed to be sufficient. But the work of the N. B. M. A. committee was to so thoroughly probe the entire question of testing paving brick that their standard method would secure what is desired by all, or reliable, satisfactory results. Now the very extensive experiments made by Professor Orton, at Columbus, and by Mr. F. F. Harrington, a civil engineer of St. Louis, show that it is necessary to use a 15-per-cent. charge of brick, which may call for ten to thirty brick, according to the size of brick and rattler. While this number entails collecting the samples with horse and buggy, or shipping at least a barrel of brick, this is equally obligatory on five or ten brick, and while the freight bills may be increased a few dimes, this is a trivial matter if reliable results are thereby attained, and is not worthy of consideration.

That too many brick are used in the test to detect lack of uniformity is a comment that indicates a want of familiarity on the part of Professor Talbot with the details of manufacture of paving brick. For there is no clay so favorable, nor no plant so well equipped and carefully run, but that some defective brick will reach the streets in spite of the final sorting at the kiln. For the opportunities for defects occurring in the manufacture of paving brick between the first, or grinding stage of the clay, and the final cooling stage in the kiln are so numerous that it would be other than human if none but perfect brick finally reached the loading gang. But the object of testing paving brick is not to find out if there is one or more defective brick, which is the work of the inspector, as every manufacturer and user of paving brick (or any other kind of paving or other material) is well aware that, as long as he has to depend on common labor, continuous perfection is unattainable. But as no two clays are quite alike, and as the same clay produces quite different grades of brick, according to the details of manufacture, a reliable method of testing paving brick is urgently needed to bring out the average differences between different clays, and between the various grades produced from the same clay. It is such relative average values that is sought, and not individual defects of one or two specimens, and what Professor Talbot urges as an objection is really a very valuable feature in the N. B. M. A. method, in that it secures a reliable average result because it is based on so many brick that individual defects are eliminated. The best brands of paving brick may and do contain imperfect specimens, but the poor grades of brick cannot make good records when tested by the dozens, and the object of the rattler is not to displace the inspector.

Professor Talbot's third objection "that a slight decrease in the number of brick below the number required to make 15 per cent. of the volume will seriously affect the results" is a surprising criticism to come from an engineer. For to get harmonious, comparable results, it is necessary to adopt the same method, and if 15 per cent. is found to be the most desirable volume as a standard, why 15 per cent. should be taken—neither more nor less. If, however, the size of the brick as such to make it impossible to exactly arrive at 15 per cent. of the rattler volume without chipping the last brick, Professor Orton's and Mr. Harrington's data do not show that any appreciable error will result if a slight excess over 15 per cent. be taken.

The last objection that Professor Talbot makes to the N. B. M. A. method, and the only one which he really seems to regard as of importance, is that their method will not sufficiently distinguish soft and brittle brick. This criticism is based on experiments made by him on four kinds of brick in a rattler 24 inches in diameter by 36 inches long, that was run at a speed of twenty revolutions per minute, with a charge consisting of twelve brick, 150 pieces rounded cast-iron shot 1 by 1½ by 2¼ inches weighing one pound each, and 150 pieces cast iron (called shot), 2½ by 3⅛ by 5¼ inches weighing eight pounds each, which was run for seven different periods, that gave from 200 to 1,800 revolutions to each charge. Professor Talbot says brick Nos. 1 and 2 are excellent repressed shale pavers; that No. 3 was a well-burned, good surface-clay brick, while No. 4 was a building brick, and all were specially selected specimens. Tests were also made on these brick by the N. B. M. A. method, or with 15 per cent. of the rattler filled with brick only, and run at thirty revolutions, and the results of these two methods are shown side by side in the accompanying four pairs of curves shown on Diagram 2.

The deductions that Professor Talbot draws from these diagrams are: That the N. B. M. A. tests make brick No. 3 as good as Nos. 1 and 2, when it is manifestly inferior.



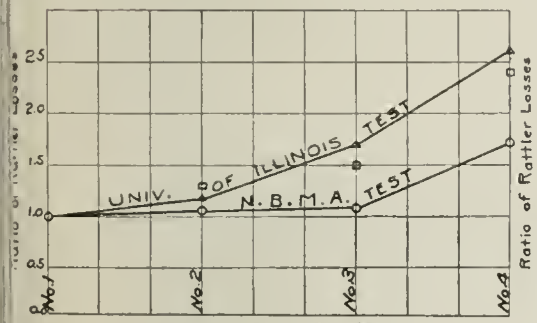
2. The loss in brick No. 4, which is unfit for paving, is much less distinctly marked in the N. B. M. A. test than in Talbot's method.

3. Hence the N. B. M. A. method has serious defects.

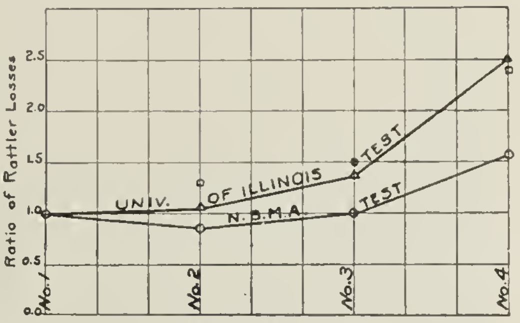
In reviewing these conclusions, it is surprising that Prof. Talbot should claim that he used the N. B. M. A. method when compared with a proposed new method, for by using a twenty-four-inch instead of a twenty-eight-inch rattler, as specified by the N. B. M. A., the impact effect is so much less as to reduce the rattler loss over 30 per cent., according to Professor Orton. This difference will greatly affect the results, and probably totally reverse diagrams of Bricks 3 and 4, which are the two which cause Professor Talbot to question the standard method.

In the absence of data derived from the large, heavy impact-giving standard rattler, Professor Talbot's experiments can only be called comparisons of brick and cast-iron-shot fillers in a twenty-four-inch rattler, and not the N. B. M. A. method with the Talbot method. So considering these experiments as comparisons on a small rattle that mainly gives abrasion, rather than impact effect, with brick and iron-shot fillers, we note that on brick Nos. 1 and 2 the brick filler, as recommended by the N. B. M. A., gave uniformly much greater losses, and therefore shows much greater sensitiveness, than the iron shot filler. On brick No. 3 the two methods gave closely agreeing results in five out of the seven tests, but in the seventh test the iron shot shows about 3 per cent. greater loss. Professor Talbot gives the absorption of these brick as follows: No. 1, 0.5 per cent.; No. 2, 2.2 per cent.; No. 3, 3 per cent., and No. 4, 4.7 per cent. He also adds: "Brick No. 3, in structure, appearance, wear and life in pavement, under ordinary conditions, show that it is inferior to Nos. 1 and 2," and therefore as the iron-shot method gives a 3-per-cent. greater loss in the seventh test than with a brick filler, in the small twenty-four-inch rattler, it is a superior method in bringing out this inferiority. Now the N. B. M. A. rules require that two tests be made, and the average taken, in all rattler tests, on account of the variation that is found to occur under the best endeavors to attain similar conditions, yet this sweeping deduction seems to be based on only a single determination, and as five out of seven tests at different speeds give practically identical results by the two methods, it looks as though data based on a larger average would probably show concordant results throughout the entire series.

Further, Professor Talbot's personal and ocular opinion of this No. 3 brick may be correct on kiln-run brick as laid on the street, but on the picked specimens that were tested the writer prefers to accept the evidence of the rattler that these picked No. 3 brick were fully as good as Nos. 1 and 2. The writer will also add that he has seen more than one instance where selected specimens of surface-clay brick have exceeded in toughness any shale brick, though as a practical paving-brick proposition, it was out of the question to get even a small percentage of the kiln of this extreme toughness.



Loss in 1800 revolutions



Loss in 1000 revolutions

The writer is therefore compelled to regard the criticisms of Professor Talbot on No. 3 brick as untenable, and more thorough and reliable data is necessary before it can be questioned as not being fully as good as Nos. 1 and 2 (at least these picked samples of No. 3), or used as an argument on the N. B. M. A. methods, aside from what follows.

As No. 4 brick is not shown to be quite so bad by the so-called N. B. M. A. method as by Professor Talbot's method, he again claims that the N. B. M. A. method is not sufficiently sensitive, and does not discriminate so keenly as his iron-shot method, although his experiments show it to be more sensitive on Bricks 1 and 2. This criticism is seemingly far better supported by facts than in the case of No. 3 brick, as all seven tests give the same kind of a result, and, if the facts were obtained by proper methods, there would be room to question the N. B. M. A. method for this particular brick as not being as sensitive as Professor Talbot's, though both show that it is a very poor brick for paving. But the improper way in which Professor Talbot conducted his so-called N. B. M. A. test in a small rattler, with its slight impact action, instead of a large one, with its heavy impact, at once vitiates his data, as such a brick would be very susceptible to impact, and would give a very different result if properly tested, for its absorption of 4.7 per cent. shows that it was rather soft. Now, in Professor Talbot's method, the charge consists of twelve brick, or 5 per cent. of the rattler volume, 150 pieces of one-pound shot, or 3 per cent., and 150 pieces of eight-pound shot, or 38 per cent., or a total filling of 46 per cent. of the volume of the rattler. With three hundred pieces of hard cast-iron, amounting to 41.70 per cent. of the rattler volume, rolling over twelve rather soft brick, amounting to 5 per cent., the abrasion or wearing action must be much greater than when only about forty soft brick, amounting to 15 per cent., are rattled by themselves; and as the rattler was too small to give much impact, Professor Talbot's hard cast-iron-shot filler must give a greater loss than the softer brick filler in his twenty-four-inch rattler. So as an abrasion test, Professor Talbot's cast-iron filler will be more severe and therefore more sensitive on soft brick than with a soft brick filler; but on vitrified brick, which are harder than cast iron, the iron shot will not show as severe abrasion as with a vitrified brick filler and hence his method on brick Nos. 1 and 2, which must be vitrified, since their absorption is 2.2 per cent. or less, does not show as great a loss as with the vitrified brick fillers. This also explains why the two methods agree so closely on No. 3 brick, for as its absorption is 3 per cent., which shows that it is incipiently vitrified, its hardness must be about the same as the cast iron, and hence of about the same abrasive power. The evidence of bricks Nos. 3 and 4 have therefore been misinterpreted by Professor Talbot, as he keenly realizes that impact is a very important factor in the life of paving brick, and his severest criticism of the N. B. M. A. method is because it does not give enough impact action to furnish reliable wearing data. It is therefore especially surprising that he used such a small rattler as twenty-four inches in diameter, which Professor Orton's work, as well as analogy, shows must be much less severe in impact action than a twenty-eight-inch diameter, as recommended by the N. B. M. A.; that he buried and covered his brick so completely in 41 per cent. of cast-iron shot, when the brick made up only 5 per cent. of the rattling volume, which would protect the brick from the blows, but insure severe abrasion, and that he ran his rattler at the slow speed of twenty revolutions, which gives a periphery speed of 1,507 inches per minute, whereas the N. B. M. A. speed is 2,637. As the higher the periphery speed the greater is the tumbling or impact action (as low speeds produce sliding or abrasion, while high speeds produce tumbling or impact, within the limits of speed employed), this reduction of 57 per cent. in the periphery speed from the standard N. B. M. A. method is a remarkable contradiction of Professor Talbot's criticisms, although the very severe destructive action on the rattler of the iron bricks at such a high speed may have rendered this slow speed compulsory to save his rattler.

That Professor Talbot obtained abrasive action instead of impact, as he conducted his tests with the few bricks buried under such an enormous excess of cast-iron shot, is further verified by the remarkable regularity of the iron-shot curves, which are possible when it is an abrasion test, but cannot be secured with such exceptional regularity where impact is an important factor. For the effect of heavy blows is necessarily uncertain and more or less erratic in its results, and even where the tests are averaged over a large number of brick, as by the true N. B. M. A. method, the results are still lacking in the beautiful regularity of Professor Talbot's or any other abrasive curves. In the twenty-four-inch rattler which he used there was still enough impact in his so-called N. B. M. A. tests to cause a noticeable deviation from the regularity of the abrasion or University of Illinois curves.

The use of cast-iron blocks or shot, even in such small amounts that impact is secured by not burying them under an excess of iron, introduces a foreign element that is steadily wearing smaller, and hence less severe in its action, while different lots from different foundries, or different lots from the same foundry, are liable to vary greatly in their hardness and toughness, and thereby greatly increase the difficulty of obtaining results that can be compared. As these complications and difficulties are eliminated by using a brick filler, and as a rattler can be so designed and run as to secure solely abrasion or solely impact in its action, or any combination between these two extremes, the N. B. M. A. committee thought they made a step in advance in also abandoning this inheritance of crude, pioneer times, especially as the cast-iron blocks soon demolish the rattler if it is run at the speed necessary to secure impact action, a practical feature of no small moment.

In closing, the writer thinks that Professor Talbot has furnished valuable data in indorsing the action of the N. B. M. A. Committee of Standard Tests when it recommended the abolishing of the absorption and cross-breaking tests as indices of the wearing value of paving brick.

The data that Professor Talbot gives from the use of cast-iron blocks or shot in the rattler test also indorses the action of the N. B. M. A. committee in rejecting the use of any foreign filler in the rattler in order to obtain reliable, satisfactory and comparable results. While these deductions are entirely different and quite the reverse of what Professor Talbot draws from his own diagrams and data, the writer thinks that they have been misinterpreted and improperly construed by Professor Talbot, and he offers this contribution for others to criticise and comment upon in the effort to arrive at "more light."

Written for the CLAY-WORKER.

A GREAT FRONT AND ORNAMENTAL BRICK MANUFACTORY.

OHIO IS A GREAT STATE, take her any way you may. Endowed with remarkable enterprise and energy, her sons have achieved greatness in every walk of life. With an untold wealth of natural resources, among the most valuable of which is her vast deposits of clays and shales or all kinds, it is but natural that she should lead the world in the production of clay wares. Among her many successful clayworking establishments, none perhaps deserve more praise than the Columbus Brick and Terra Cotta Co., for no branch of clayworking requires a greater investment of capital and brains than the making and marketing of fine ornamental and front brick. Both in the manufacture and sale of fine pressed brick a very high order of ability is absolutely essential to a large measure of success. He who, in these days of fads and fancies, undertakes to meet the demands of architects and builders for high-class front brick must be more than a mere mechanic, he must have a fund of technical information that entitles him to rank with engineers and chemists of no mean ability. While he who directs the commercial end of the business, if successful, deserves to be classed among the masters of finance. As proof of this we cite our readers to the heads of the executive and operative departments of the C. B. & T. C. Co. Mr. L. G. Kilbourne, the President and General Manager of the company, and Mr. Ellis Lovejoy, the Superintendent, are most excellent examples of what the heads of such a concern ought to be. They are both honored members of the N. B. M. A., and will be much in evidence at the coming Convention, and, we hope, many to follow.

—The Columbus Brick and Terra Cotta Co.—

This company was organized in 1884, to engage in the manufacture of clay products.

The general office was in Columbus, O., but the plant was located sixty miles from Columbus, in the Hocking Valley, on the western edge of the coal field.

Ground was broken in the fall of 1884, and the factory was ready for operation with the opening of the season of 1885.

The initial plant had two Whittaker machines—a two-mold and a one-mold—with a daily capacity of 15,000 brick. These were the first dry-press machines in Ohio.

A small continuous kiln, which would hold in all its compartments 180,000 brick, and which could be burned around about once a month, constituted the kiln room. This was the first continuous kiln in Ohio, and perhaps the first west of Pennsylvania.

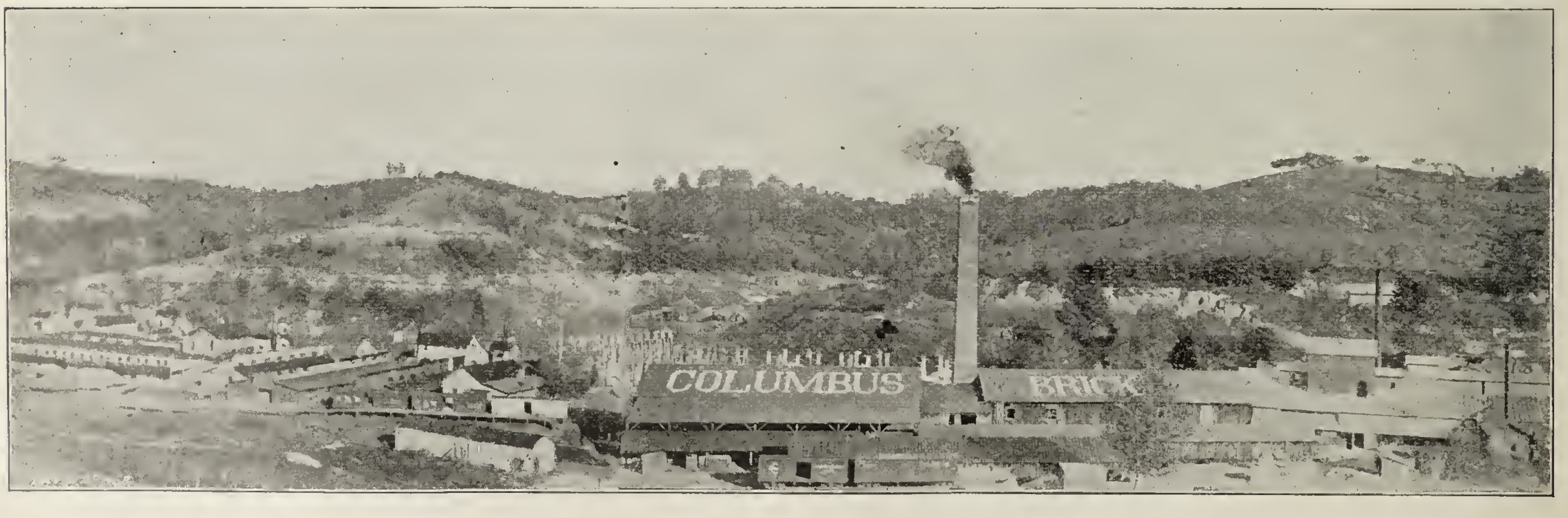
The plant was started on red bricks, while tests were being made to develop the terra cotta feature of the business.

The discouraging results of the first year led to a re-organization of the company in the spring of 1886. The manufacture of red brick was abandoned, and it was decided to run the plant on fire brick, using the dry process. Excellent No. 2 fire clays, and a highly refractory silicious rock, on the company property, gave the raw materials for a considerable portion of the product, and No. 1 flint clays were shipped in to complete the line of ordinary fire bricks.

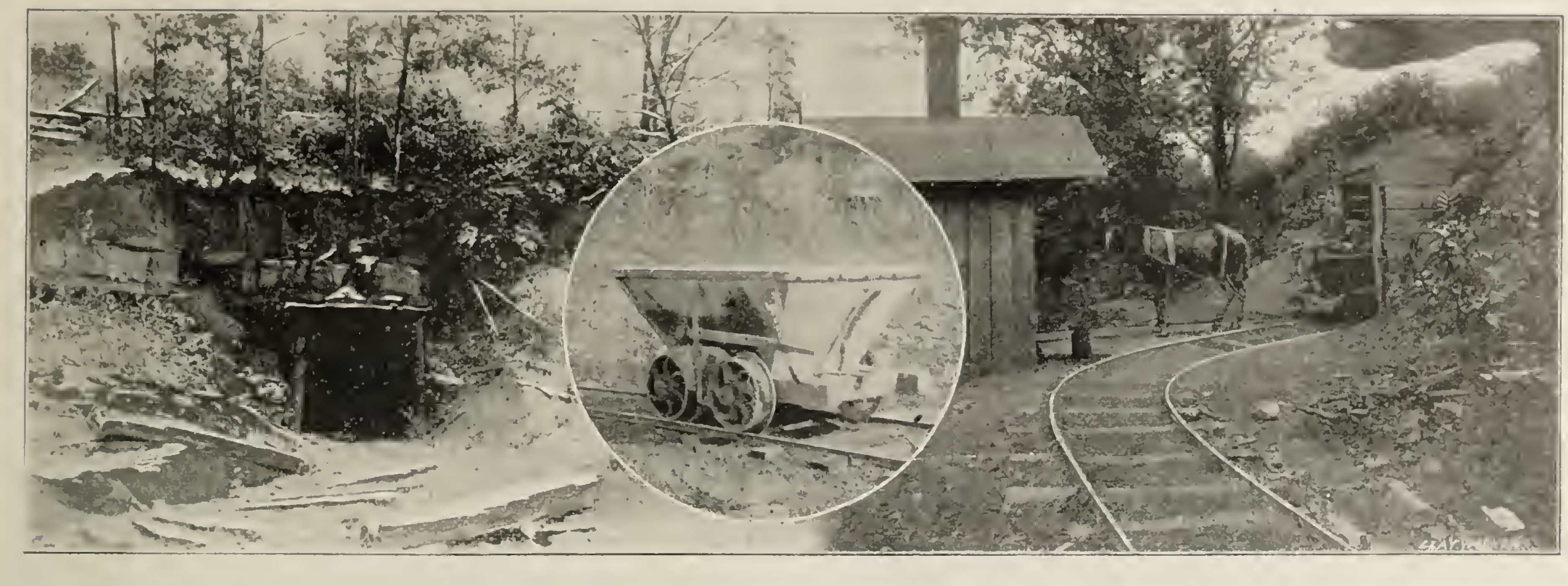
A Group of Kilns.

In this manufacture of fire brick by the dry process the company was a pioneer.

It was but a step from fire brick to buff building bricks, to which the process was better suited, and to this business the company in time turned its entire attention. Various shades of buff were developed, followed by pinks, grays, mottled, etc. Each year the plant has been enlarged—additional machines, more power, new kilns, stock sheds, etc. The present daily capacity is 45,000 brick, with special machinery equivalent to 20,000 more. The continuous and down-draft kilns will hold about one millions bricks. Over an acre of iron roofing is required to cover the factory, kiln and stock sheds. It carries about 3,500,000 brick in stock, which includes a half-million ornamental brick from three hundred different molds. The



Works of the Columbus Brick and Terra Cotta Co., Union Furnace, Ohio.

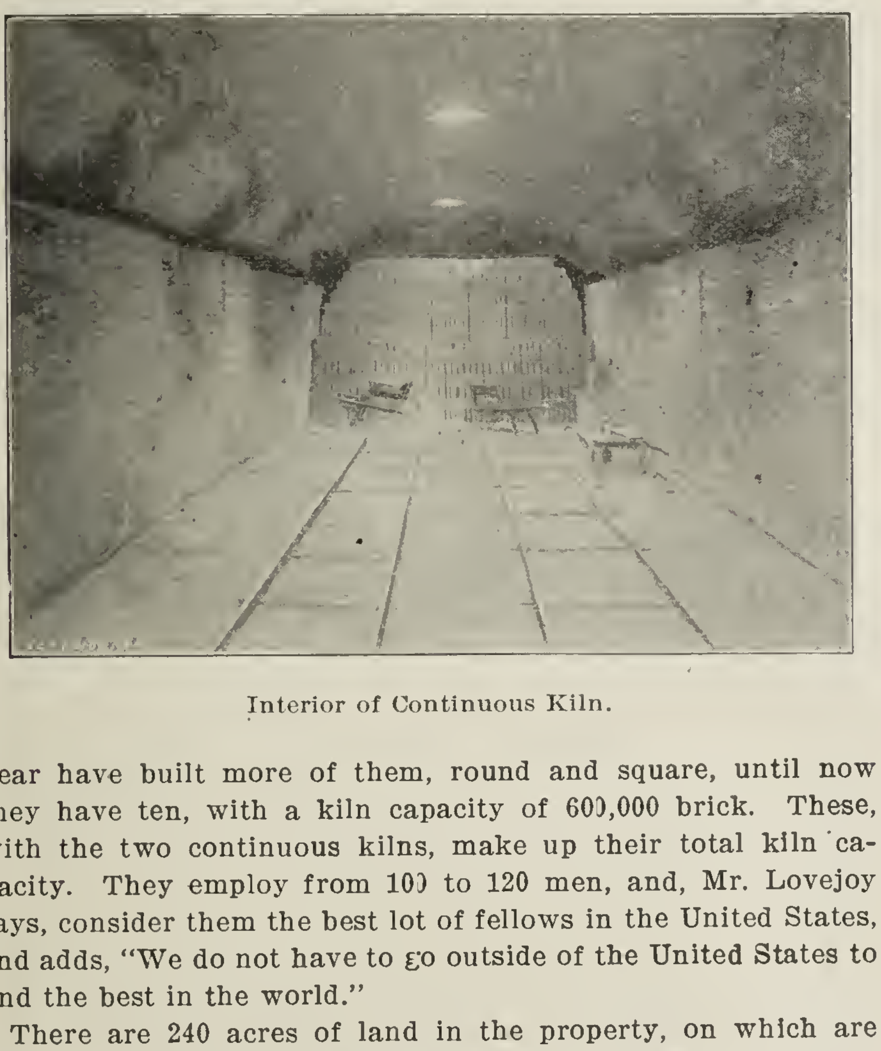


East Entry to Clay Mine. Bottom Dump Mine Car. From Mine to Factory.

company was not only a pioneer in dry press work in Ohio; in the use of a continuous kiln in the west; in the manufacture of fire brick by the dry clay process, but it was the first to devote its entire plant to the manufacture of buff bricks.

These represent considerable experience, in which, at least, the company is rich.

Early in 1892 they added a four-mold Boyd press to the plant, from which they have had many millions of brick in the seven years of steady run, and from which they expect to get many millions more. They now have three dry pans—an East Liverpool pan, a Columbus pan and a Bucyrus pan. They have a complete outfit of Raymond's machines, viz.: Daytonian machine, pug mill and Perfection re-press. They built a small round Eudaly kiln during their second year, and from year to year have built more of them, round and square, until now they have ten, with a kiln capacity of 600,000 brick. These, with the two continuous kilns, make up their total kiln capacity. They employ from 100 to 120 men, and, Mr. Lovejoy says, consider them the best lot of fellows in the United States, and adds, "We do not have to go outside of the United States to find the best in the world."



Interior of Continuous Kiln.

There are 240 acres of land in the property, on which are found three veins of buff clays, ranging from four to twelve feet in thickness; fifteen feet of clay shale and twenty or more feet of "fire sand." These furnish the raw materials for the product.

The shales are won by stripping and benching, while the buff clays are taken from under the hill by ordinary double entry mining.

Double entries eight feet wide are driven into the hill, through the clay vein. When in far enough to get a set of rooms, cross entries are turned off to the right and left, and from off these rooms are opened toward the crop and into the hill. While these rooms are being worked out, the main entries are being pushed into the hill, a second set of cross entries turned off, and rooms opened, etc.

The entire product of the plant is face brick in the many light colors, including grays, with ornamental bricks for each color, all of which are carried in stock. They make not only different colors, but several sizes, viz.: "Standard," "Roman," in eight, ten and twleve-inch lengths, and "Norman"

The brick is known on the market as "Columbus" brick, and are recognized the country over as the equal of the best. There are very few cities in the land of any importance, architecturally, where "Columbus" may not be found.

THE IDEAL WIRE-CUT BRICK.

WHAT IS A REPRESS? A repress is a shaper made to put into good and merchantable shape brick that have been improperly made, improperly cut and carelessly handled. This applies to building brick more particularly, as we will not contest the claim that a paving brick or an ornamental brick is the better for repressing.

A bar of clay made of properly prepared clay forced through a perfect die is a thing of beauty, and, if not spoiled in the making, like the boy who was cut out for a preacher, perfect brick should be made of it. But the fact of having a repress has a tendency to make the brickmaker careless, as he depends upon the repress to correct the faults and bad results from indifferent machinery and work.

The bar of clay, be it ever so perfect, is spoiled on the cutting table. The cutter that cuts straight across the bar ruffles up the edges of the brick the full length of the brick. The cutter that cuts the up-across-down motion ruffles up the first half of the edge of the brick and makes the other half fairly smooth, the general result being far from desirable in a face brick.

The numerous cutters aiming at a down cut are faced in the right direction, but, in our opinion, the "perfect cutter" is not yet in the market, and, until the perfect cutter is produced, represses will still be popular. A perfect cutter will take a perfect bar and cut it into bricks having perfect edges, and, when that time comes, the days of the repress for face brick will be numbered, as the perfect wire-cut brick is surely the ideal brick.

Take a perfect wire-cut brick, handle it as fine pressed brick should be handled, dry and burn it as pressed brick are dried and burred, and you will have a brick equal, if not superior, to the pressed brick, and at less cost.

Wire-cut face brick should be set on edge on pallets, and, where the clay whitewashes in the dryer, the brick should be set on edge on pallets so made as to allow the brick to be faced on each other.

The wire-cut brick is the better brick to lay, as the mortar takes hold on the rough sides much better than on the smooth sides of the repressed bricks.

For a pretty effect, use in your building straight-edge, well-made, wire-cut brick, kiln-run as to color.

The man who introduces the sharp-edge cutting table will be a benefactor to his race, and the wire-cut brick of to-day will pale into insignificance before the ideal wire-cut brick of the future, and the trade will not call for the repressed brick when it can obtain the "ideal wire-cut."

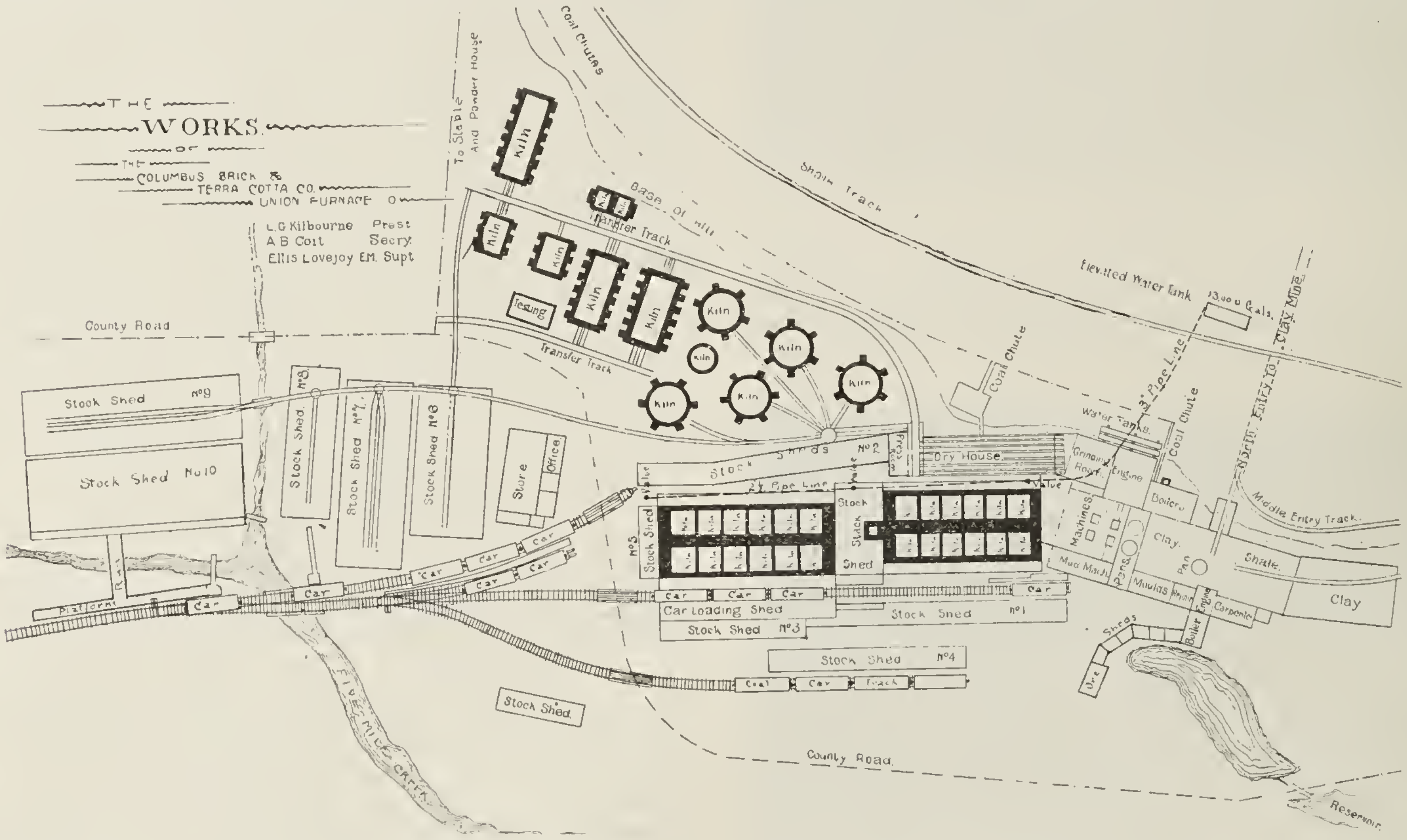
T. W. CARMICHAEL.

Written for the CLAY-WORKER.

BUTTON-HOLE TALKS.

NEVER A WORD did I say as he let go, but just heaved a sigh, and looked at the next of the seven in line, as he hooked on, without waiting for me to say "You're next."

"You have written and you have talked about concerted action by the clayworkers in pushing the more extensive use of their material, but you haven't accomplished much. When the reverberations of your musical voice have died away these people have forgotten what you said. Probably you thought you had them when you wrote something that was printed, but you had not, for they just skipped it or threw it into the waste-basket.



"This happens, too, when they all know that it is a move in the right direction, and one that should be encouraged and helped along. What is wanted is action and a leader; some one to look the matter up and see to details; some one to note prospective building operations and act on them and get others to act, and to do this in time. Now, when a building is brought to our attention, ten to one all the material is selected, and we are too late anyway to accomplish anything. Then, too, we are working alone, individually, and not as an organization. In addition to working as an associate body we can, of course, work as individuals in concerted action. For instance, suppose a live man (it's hard to suppose, as they are scarce, and what few there are are busy), but suppose a live man at the helm, awake and on duty most of the time daytime and occasionally in the evening, finds that a government building is to go up at Smith City or a public library at Jones' Corners. Suppose the live man gets busy and stirs up the men in line, with the result that the congressman and influential politicians begin to get letters from the brick manufacturers, who are their constituents, urging a fireproof building, a building that will withstand the elements, a building that will give labor to home men and use home material, a building made from clay dug in America and wrought by American hands; not with an Italian or African wainscoting, nor an English floor tile, nor a French tile roof, nor a State's Prison-wrought stone, but a building that is American and honest all the way through. What is the result? Congressman Smart calls on Senator Summ and remarks that he has had several letters from good men at home urging a fireproof building for Smith City. Senator Summ has also had his eyes rested on similar letters. They confer. They realize that they will have to go home soon and ask these men to vote for them, and this thought fixes it, and they go to the supervising architect and state their views and their wants. He pays attention to them and their views, because they are all in the same boat and are politicians, and want votes, and know that if these men are ignored there will be a day of reckoning.

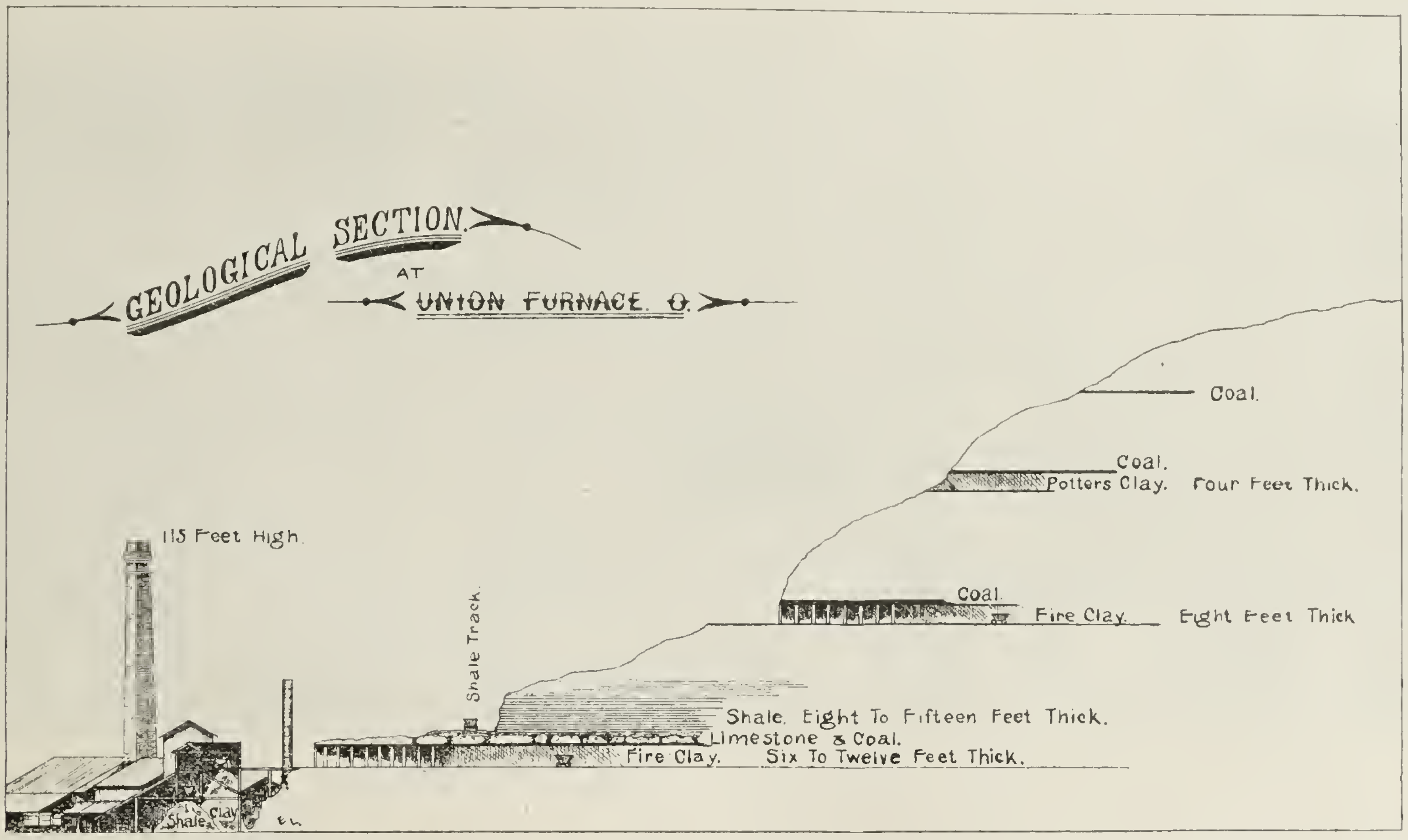
"The same thing applies in other cases, though it is particularly strong in public edifices. You fellows, though, take a little spurt once in awhile, but immediately fall down and quit pushing, and leave it all to the clay papers and the architectural papers, and expect such men as Randall, of Clay-Worker fame, and Rogers & Manson, of the Brickbuilder, to work the trade for you while you sit still. You want them to shake the tree and you catch the fruit. One man acting alone cannot accomplish so very much in any line, but by acting with a lot of other men, or marshaling an army of men to act with him, there is nothing that cannot be accomplished. One man could not dig the Suez canal, but a whole lot of men did dig it, and it bears the commerce of the world.

"The association went off on a resolution to push the use of brick for houses—common brick houses; went into taking a class only—not press brick or terra cotta, but common brick for houses and homes only, and they probably did it because it was popular and looked quick. It is the slowest and hardest field of the whole lot, though, and I predict that the next convention will find but little progress in the line of anything actually accomplished in any of these fields. Brickmakers will still be putting up frame houses, and public buildings will still be coated with stone shaped in front by convict hands and hacked horribly on the back in an effort to keep out of the way of instead of fitting up to the steel beams and columns, which it hides, but does not protect.

"You all know how to cut prices, but you don't seem to know how to build up trade. You can talk it some, but you don't do it a little bit." GATES.

AMONG DOWN-EAST BRICKYARDS.

IT HAS BEEN the best fall for brickmaking for twenty years. To begin with, sales are good, and have been better than for any fall within that period. The weather has been perfect for the objects of the brickmaker, that is, the making of necessary changes and improvements in yard and clay banks. The spring will find nearly every brick in eastern Maine yards used up. The demand is bound to be big. Yet the brickmakers are not happy. Nor have they shown courage to ask a price for their goods such as the market would warrant. If business is bad, and they say it is, Maine brickmakers have only themselves to blame. A. H. Gould, of Brewer, is making a new yard and increasing his capacity by one machine. He will have four next year, with a daily output of 50,000 brick.


GEOLOGICAL SECTION
AT
UNION FURNACE, O.
Coal.
Coal.
Potters Clay. Four Feet Thick.
115 Feet High.
Shale Track
Coal.
Fire Clay. Eight Feet Thick
Shale. Eight To Fifteen Feet Thick.
Limestone & Coal.
Fire Clay. Six To Twelve Feet Thick.
Shale
Clay

Wm. Burk, one of the most successful manufacturers in Penobscot county, has made preparations to double the capacity of his plant next year. Mr. Burk began manufacturing brick in Brewer when there were fourteen brickyards in operation there, about fifteen years ago. He had little capital, but lots of grit and energy, and keen business judgment to begin on, and while the number of Brewer brick manufacturers began to dwindle, and have dwindled to four plants in operation now, his plant has been run, and every year he has set by a little sum to represent the season's earnings. There is now in the vicinity of the brickyard a handsome city by itself, that has grown up in the one-time pastures, and Mr. Burk has been the promoter and chief pusher and profit-sharer in its building. Mr. Burk is on the lookout for some improved method of turning out brick. His clay is of excellent quality, working up easily without drying in an ordinary Hobbs machine pug mill, and it burns a beautiful red. It is well adapted for fancy brickmaking.

Hugh O'Brien's, the largest brick plant in Brewer, will be somewhat enlarged this coming spring. S. A. Holyoke will also make some changes.

Dr. James B. Grady, of Eastport, has purchased a tract of clay land near that city, and will begin, early in the spring, the construction of a great brick and tile plant. The brick will be made for the Eastport market mostly, but the concern will make a bid for a place in the markets along the New England coast. Eastport is growing rapidly. The largest shook mill in the world is being erected at Lubec, just across the harbor, and fifteen sardine factories of great size are helping to make the call for brick loud and prolonged. A large brick hotel is to be built at once at Ultona Springs, the water of which is said to be the most healthful in the world. It is a recent discovery, this medicinal quality, and that peculiarity added to the fact that the climate of Eastport is singular for equable temperature, despite the high altitude and dryness, will, no doubt, give the place a great boom as a health resort, for both summer and winter. As a shipping point, Eastport is favored, as all Maine coast towns are, in a high degree. Dr. Grady's venture will, without doubt, prove a very profitable one. Associated with the doctor in the enterprise will probably be some western brickmakers, whose attention was called to the advantages of Eastport by an article in the Clay-Worker recently.

Several times within a year the directors of the Columbia Falls Brick Co. have come near to a settlement of their differences, but each time somebody balked, and the result is that one of the best brick plants in the State of Maine is idle since last December, and a twelve-arch kiln, which was ready for the fires early in December, 1897, is still standing unburned in the kiln house. There is some curiosity to see what the effect on the brick of such long standing in a green state will be. The river is but a few feet from the kiln, though the kiln ground is several feet higher than high-water line, yet it seems there must be some injury to the lower bench brick. But that is only conjecture. With the opening of the Washington County railroad, which will take place in a few weeks, a great new country is opened up, and brick business will be good along the Maine coast for a year or two. The new railroad runs 100 miles, from Bangor to Calais, through Columbia Falls and Eastport, and the yards at those places will come in for a great share of the demand for brick, though Brewer, Bangor and Ellsworth will supply a great deal.

North of Bangor are the greatest signs of hope for the brickmakers, though. At Norcross, on the B. & A. railroad, 100 miles from Bangor, the largest pulp mill in the world is to be erected in the spring, it is said. Ten million of brick will be used before the mill is completed, according to the plans the knowing ones give out (the entire output of the Bangor and Brewer yards this year was not more than 5,000,000). Besides the Norcross pulp mill, there is now being laid on the Milford shore of the Penobscot river, twelve miles north of Bangor, the foundation of a new paper and pulp mill, which will take several millions of brick to complete. On the Old Town shore of the river (opposite Milford) is being laid the foundation for a large brick woolen mill, for which Hugh O'Brien, of Brewer, has sold 500,000 brick, and several hundred thousand more will be required. A mile south of this place there is being constructed an addition to the pulp mill of the Penobscot Chemical Fiber Co., for which Wm. Burk, of Brewer, has contracted to send 500,000. And other schemes for mills at that point and at points above and below are maturing. At Orono and Basin Mills, where there are large pulp and paper mills, important additions of brick will be constructed in the spring. Besides these there are more plans talked of for the erection of brick buildings in Bangor and Old Town next year than has been known for years. Bangor, with the opening into it of three new lines of railroad and with a possible fourth in the near future, has its arms extended to every point of the compass, and as a wholesale center it is fast coming into prominence, and brick buildings for stores and office rooms must be realizations of the near future.

Note this, the saw mills of Maine must succumb before the finer competition of the western mills. In their place is coming the pulp mills. Maine will soon be the pulp State. I think she is near the top now. But where this touches brickmakers is here, the saw mills were invariably wooden structures, the pulp mills are always of brick. While the industry in building brickyards will live, when the pulp business is done there will be something else to create a demand for brick. But no matter how roseate the hue we would paint this picture, let it be known that the pulp industry is not a perpetuity in Maine. It would not take long to count the years in which, if invention doesn't step in and remove the pulp mill, the State of Maine would be totally denuded of timber. The saw mill cut the mature timber and saved the young trees, the pulp mill eats the forest out of face. There will always be, let us hope, some industry to utilize the magnificent water powers of State, and with this hope as an anchor, the Yankee brickmaker may lay by his shekels when he can, and if worse comes to worse, why he can fold his tent like the Arab and silently steal away with the forests and the pulp mills. It is, no doubt, with some such hope in their hearts that Mr. Hosea B. Phillips, of Ellsworth, and Mr. Cal. R. Gardner, of Pembroke, are preparing to make a great deal more brick this year than they did last, and Dan Mullen, from the reachless wilds of Ashland, in the north, is to double his yard capacity. Notwithstanding the encouraging outlook and the small supply on hand, the average price of common brick is not over $5.25 per M.

The Eastern Maine Asylum for the Insane, at Bangor, one building of which was erected two years ago on the site of the institution, may possibly be completed soon. The project was given a recess of two years by the Legislature in its last session through a failure of the politicians to agree. This winter an appropriation will probably be passed to complete the other buildings. This will add at least 1,500,000 bricks to the coming demand of the brickmakers here.

There is a good opening in this vicinity for a plant to manufacture face brick, one of moderate capacity that would turn out a first-class article. A plant properly managed would create a market for itself. There are good sites anywhere on the outskirts of Bangor. The time is already here when the brickmaker should learn to create a market. The old pot augur plant must go here, as it has gone in other places. Progress is the watchword of the hour and this section is ripe for it. A company is talked of here to control the patent to manufacture boards and short lumber of clay and sawdust. But little is known of the process. Its inventor, a Brunswick man, has great faith in it, and samples of it shown are said to be really marvelous. It can be put to almost any use to which boards are put and is said to wear longer and give better general satisfaction.

Anders Persson, the last New England potter, proprietor of the Bangor Stoneware Works, is about to enlarge his plant. A stock company will be formed, capitalized at $100,000 and four new kilns will be erected. Mr. Persson is now replacing his wheels by machines to mold the various products of his plant, which hitherto were turned as Pharaoh's minions turned them.

B. J. DUNN.

Snapshots at Union Furnace by Ellis Lovejoy. 1. A Eudaly Kiln and Furnace. 2. In the Stock Sheds. 3. A Whole Crew by Himself. Page 20.

SIGNS OF THE TIMES.

As Reported by Chambers Brothers Company.

Editor Clay-Worker:

In reply to your inquiry as to the business outlook, we have about concluded we are not much good at forecasting the future. As to immediate conditions, would say that we last week shipped a dry pan to the Sayre & Fisher Co., which is the third one to them, and we have booked a lot of additional work for this company, to be delivered after the first of the year.

We also sent last week a large size automatic end-cut brick machine to Virginia. This replaces one of our 25,000 per day machines, in which we have a bargain for some enterprising brickmaker needing this capacity. You might note this fact in your second-hand machinery column, and send us the bill. I think two insertions will be sufficient.

This week we are sending one of our largest brick machines, with the automatic side cutter, to Louisiana, almost adjoining the yard on which we placed our first automatic side cut about a year ago. Machine No. 1 must have made a fairly good record, or this order from the same locality would not have followed.

Mr. Root has just sent in a contract for another automatic side-cut brick machine to go to Georgia, and an end-cut machine for Alabama, and reports Mr. R. B. Morrison as much improved in health.

We spent a lot of money "planting and hoeing" in the South, and feel encouraged to believe that it will yet yield a "full bale."

Our new catalogue of brickmaking machinery is now ready, and, we believe, will prove more interesting than any of our previous catalogues. We shall be glad to mail a copy to any of the readers of the Clay-Worker who will send us request for the same.

Yours very truly,

CHAMBERS BROS. CO.,
J. H. Chambers, Manager.

A BUCKEYE VOICE FROM ARKANSAS.

Publishers Clay-Worker:

Yours received, with receipted bill for my subscription to the Clay-Worker, which, I think, is at the head as a clay periodical. I am now on top the Ozarks, where we have the big strawberries and red apples. The persimmon is the prominent fruit now. Bentonville is situated on the meridian line between the North and South, and it is one of the finest climates in the United States, and to-day I am sitting in my shirt sleeves with all doors open. I am working to get a brick and tile and hollow block plant started, the farmers having promised to take $200 worth as soon as burnt. The majority never having seen a tile, do not like to advance any capital, but Mr. Feel, our Congressman, wants tile this coming summer, and now I have our Board of Trade interested, and the plans are being discussed for an early start in the spring. This is one of the best openings for such a plant, for we have to ship from Columbus, Mo., and the freight costs as much as I sold for in Ohio. Yes, I got "busted," as the young folks say, and came here to climb the ladder once more. Down in purse, but high in hope, I will get there—and don't you forget it.

I have been distributing the Clay-Worker and other literature pertaining to clay work and tile drainage, and the people are beginning to ask questions. I wrote for some of the local papers, and men came five miles to find out what tile drainage would do for their wet and springy land. There are thousands of acres of land that is spouty and soured, but drainage would bring good crops.

The people in here are refined and sociable; have good churches and schools, but, sorry to say, are somewhat behind the North in the way of improvements. But they won't be long, for their is steady improvement going on. The town is putting in a cold storage plant to cost $30,000, besides telephones and electric lights, and, being situated between the Gulf and 'Frisco railroads, they can ship on either, direct to number one markets. I have orders from both roads for tile. Oh, if I only had more of the "filthy lucre," how soon I would be putting some of this red clay (the finest I ever saw) in shape to bring in the shekels, but I am like the negro who had hold of the bear's tail, am holding on, and hope before long I will get help, when something will drop, and I will be able to send you some new subscriptions for the Clay-Worker and Drainage Journal, the best periodicals published for brick and tile men. I would like to attend the meeting of the N. B. M. A. that will be held in the good old Buckeye State, town of Columbus; would like to see you and Brother Billingsley, and, as an old-timer, send my best regards to the Ohio brick and tile men.

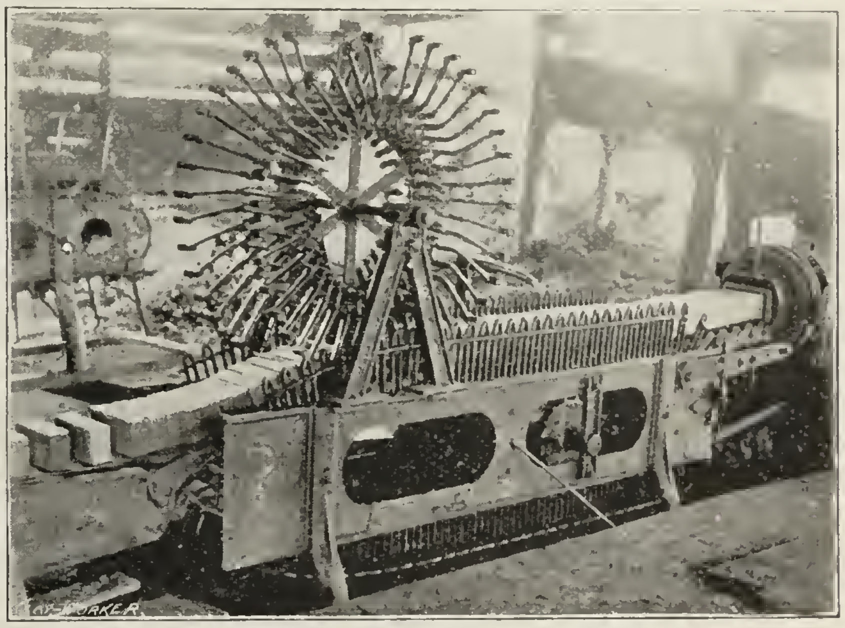
Bentonville, Ark., Nov. 19, 1898. F. M. GARDNER.

THE EVOLUTION OF THE CUTTING TABLE.

BY L. C. MOORE, MEMPHIS, MO.

SIX YEARS AGO we began the manufacture of brick by the stiff-mud process. We purchased of the Fate-Gunsaulus Company, of Plymouth, O., an outfit consisting of their "D" auger machine, with end-cut die, and a "Daisy" cutting table. We have a very plastic clay that needs no crusher, so that our outfit was not an extensive one. We do not propose to say anything here in regard to the auger machine. Such machines are too familiar to brickmakers to attract much notice. But with cutting tables it is different. A good cutting table, one that will do its work rapidly and with precision, giving an even, smooth face to the brick, is really an article that is hard to find. Machinists seem to be spending a great deal of brain force upon this subject just now, for several new patterns of cutting machines have been put upon the market during the last year. And brickmakers, too, seem interested in this subject, for we seldom meet one who uses the stiff-mud process but he inquires what cutting table we use.

When we purchased our machinery we were not posted in regard to this matter, so we bought the cheapest table we could find. It was a very good little machine, cutting three bricks at a time and doing as good work as any end cutter we have ever seen. But we soon decided that end-cut bricks were not what we wanted. So we bought of the same company their side-cut, board delivery table, which cut twelve bricks at a time. This machine was a great improvement over the first, and marks one step in the evolution of the brick cutter. We used this machine for four years and cut several millions of bricks on it. We had very little to complain of with this cutter, but, like all machines of its kind that do not cut with a downward stroke, it slightly roughened the face of the bricks. Aside from taking one man to run it, this was all the objection we had to it. We could cut forty thousand per day with it, and, until we saw something better, we thought it could not be beaten. But we became interested in automatic cutting tables, and ordered on trial one of J. D. Fate & Co.'s automatic side-cutting tables. We send you a photograph of it as it looks when at work, which will do more to show its mode of operation than any pen picture can do. It works right on whether you keep an eye on it or not, and does its work so perfectly that it is a wonder to all who visit our factory. It cuts with a down stroke, making a perfectly smooth face for the bricks. Our masons and architects pronounce them superior to any dry-press bricks that have ever been shipped to this market. The motive power is furnished by a shaft that runs under the brick machine and is geared to it. This shaft, of course, would run the table at one certain speed, and when the bar of clay should run too fast or too slow for the table it would cause the bar to swell or break. But the cutter has a "compensating" gear that can be regulated in such a manner that when the bar of clay runs slow the table runs slow; when the clay runs fast the table accommodates it just the same. If, for any reason, the mill should run empty and the bar of clay should stop, the table does the same. In fact, there is no problem in the matter of cutting bricks but is solved and no condition that it will not meet. This is the second step in the evolution of the cutting table. What next? L. C. M.



The Fate Automatic Side-Cutting Table.

SIMPSON DRY-PRESS MACHINERY IN DEMAND.

All those attending the last brickmakers' Convention at Pittsburg, Pa., will remember an interesting exhibit made by the Simpson Machinery Co. in the line of crushers, conveyors and screens.

The line is proving to be quite an important adjunct to the business of that company, in addition to their regular line of brick machinery. They have also a very fine represser, which it will be our privilege to illustrate in the near future. This represser is based upon entirely new and original ideas in brick pressing, and is pronounced by experts to be the best machine yet devised for repressing brick.

This company has also been very fortunate in securing a large contract in Southern Ohio, which includes one of their new style Model AA, four-mold press, dry pan, screen, steamer, conveyors and hangers, shafting and pulleys.

The Simpson Company is the oldest company we have advertising dry-press machinery in our paper, and we are pleased to note that they are still on deck and getting their share of the business.

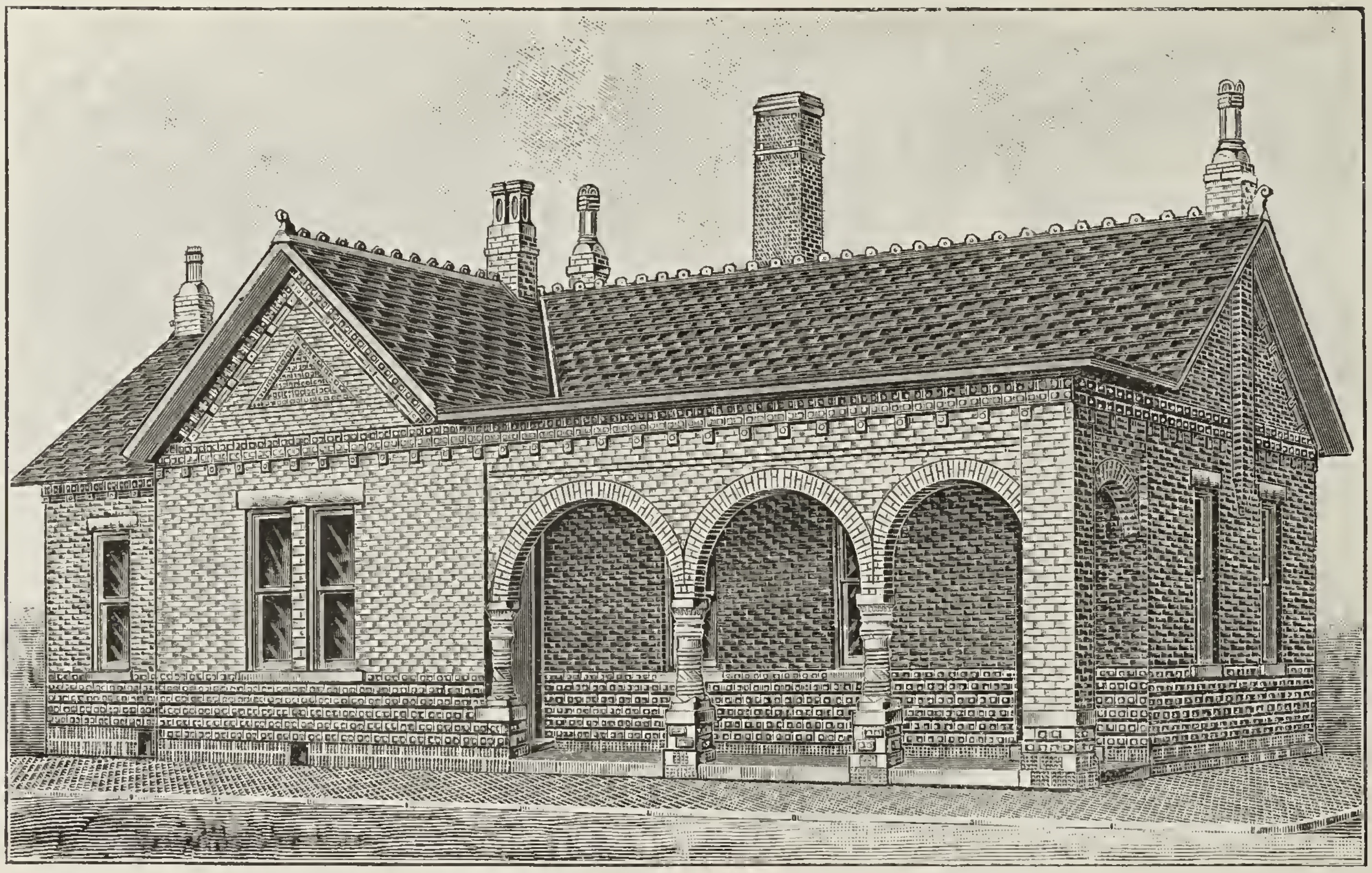
Written for the CLAY-WORKER.

AT HAYDENVILLE—A CITY OF CLAYWORKERS.

IF ONE WERE to travel through the whole length and breadth of the Hocking Valley in southeastern Ohio, he would everywhere find man wrestling with nature, forcing her to deliver up to his use the minerals hidden in those hills. Coal tipples, furnaces and factories are to be seen through that picturesque district, and the clay resources are the pride of the Ohio ceramic industries.

We have read descriptions of two Hocking Valley clay plants in recent issues of the Clay-Worker, and it is now a source of pleasure to me to bring before your notice the pioneer works of Hocking Valley, that of the Haydenville Mining and Manufacturing Co.

This company was organized in 1882 and incorporated in 1883 to continue the mining industry which had been carried on for some time previous by Mr. P. Hayden, and to begin the manufacture of fire clay wares. They own 3,000 acres situated in the heart of the famous Hocking Valley coal field, fifty-seven miles east of Columbus.



An All Clay Structure of New and Original Designs of Fire Clay Materials, Manufactured by The Hocking Clay Manufacturing Co., Logan, Ohio.

Stepping off the train at Haydenville we find ourselves just across the track from two large factories, each with its own set of kilns and its own yard. The manager, Mr. J. W. Jones, is found willing to show us the works, and invites us first to take a ride on the clay train to the mines, where the clay and coal for the factories are mined. We are drawn with no little speed behind an engine through a tunnel, and out into a smaller valley behind the first range of hills up to the mouth of the mines, some two miles distant from the factory.

We find them mining clay from three or four different strata, each lying below a coal vein. They obtain most of their clay from what is known in Ohio as the "lower Mercer," the clay being called by the company "Mingo." It lies beneath the "No. 3" coal, and, at its outcrop, the vein is about eighteen feet thick. It is when mined a hard micaceous rock, but when weathered and worked it becomes very plastic. It is used in the manufacturing of No. 2 fire brick, and as a mixture in the manufacture of other wares. We find here also strata of other grades of fire clay not used so extensively as the first. A potter's clay of much lower refractoriness but higher plasticity is mined and shipped for use in potteries and malleable iron works, etc. They also mine a clay which underlies the No. 5 coal, which is a most excellent grade of No. 2 fire clay, and suitable for a very wide range of economic applications. It is mixed with the Mingo clay, which mixture they have found to give them better satisfaction in the shape and quality of their goods than they could obtain from the use of either one alone. They also have the No. 6 fire clay, but because of its inferiority to the others in refractoriness they do not use it, except for color effects.

—Exploring a Clay Mine.—

After noting the great variety and inexhaustible quantity of clay and coal as exposed on the surface, we are taken into the mines to see how they actually obtain these valuable minerals. Almost lost in darkness, but guided by the flickering lamp of the "hauler," we travel some distance underground before the faithful horse stops at the entrance of a room. Here we are left to explore for ourselves. To the uninitiated it is a great treat. The rooms are side passages, branching off from the main entry at right angles. They are about sixteen feet wide, and extend back as far as they have worked. The rooms occur along the main entry about every sixteen feet, leaving a wall of about sixteen feet between them. After they have worked into a room thirty feet they advance the entry to where they wish to open another room, and then they work that room for thirty feet. A passage is then worked between the two rooms so as to bring fresh air up to the face of the room where they are working. After they have advanced the rooms another thirty feet they cut another passage and close the first one. Thus they extend the lengths of rooms, and cut air passages between them until one could easily be lost in the labyrinth of pillars and rooms.

But we must not stop here long, for there is much in store for us at the factories. Arriving there we find that each of them, though under the same management and only separated by a driveway, has its own clay sheds and kilns. Together they occupy a railroad frontage of about 2,000 feet, and are so arranged that they may be operated separately or unitedly.

Stepping into the rear of either of these factories we find them mixing their clay preparatory to grinding in dry pans. To this part of the manufacturing this company pays considerabe attention. Having fire clays of such different grades they are able to control the character of the body of their work by different mixtures and different fineness of grain. It will be obvious even to the casual thinker why this care at the dry pans is taken when he goes through the works and sees the different modes of manufacture. Some of the articles, such as chimney tops and special patterns, are hand-molded, while others are made by forcing the clay through dies.

But let us hurry on, for we will have to cover an area of over twelve acres if we see even the ground floor of this plant. To describe the plans of these buildings is out of the question, but it may be noted that there are nine grinding and mixing pans, five steam presses, brick and block machinery and about 500 dies of different patterns. The ware is dried on large dry-

Offices and General Stores, Haydenville Mining and Manufacturing Co.

floors, and when dried is wheeled to the kilns, which are arranged in a row around each factory.

—A Unique Conveying System.—

It is in connection with the drying that we find a very unique conveying system worthy of special notice. It is a Jeffrey endless link belt conveyor, designed by the Jeffrey Manufacturing Co., Columbus, which runs past the presses upstairs to the second dry-floor, across it and then downstairs across the first floor. The dry-floors are very large, but with the conveyor the ware is taken to any part of either floor with but little handling. It is also used to convey the dry ware to a point nearest to the setting kiln.

There are forty-five large, round down-draft kilns altogether, with a capacity of about 3,000 tons of material, which is equivalent to a daily capacity of twenty car loads. These kilns are of a special construction. In vol. VII of the "Geological Survey of Ohio" Prof. Edward Orton, Jr., says of these kilns: "Among the various types of round kilns those of the Hocking Valley Clay Manufacturing Co., at Logan, and the Haydenville Mining and Manufacturing Co., at Haydenville, are probably as uniformly successful as any in the State." They use the great vein Hocking Valley Bituminous coal, mined by the company from its own land, and take seven days for burning a kiln, the last two days of which the fires are kept at a very intense heat.

When we have at last left the factories, and are roaming about the stock yards, we begin to realize the greatness of the output of this plant. Here we find sewer pipe with all kinds of necessary fittings, chimney pipes, chimney tops and flue linings, the Hayden street paving block and sidewalk tiles, terra cotta building brick, Roman brick and other varieties of exterior wall material. But the line of goods which this firm manufacturers to the greatest extent is fire proofing. In the fire-proofing line we find the different patterns consisting of flat floor arches and ceilings, cambered arches, partition tiles, hollow roofing tiles, deafening tiles, jamb tiles window sill's, wall furring, cornice furring, column covering, girder covering and many patterns and shapes of fire proofing for covering of every shape of exposed iron work for modern fire proofing construction.

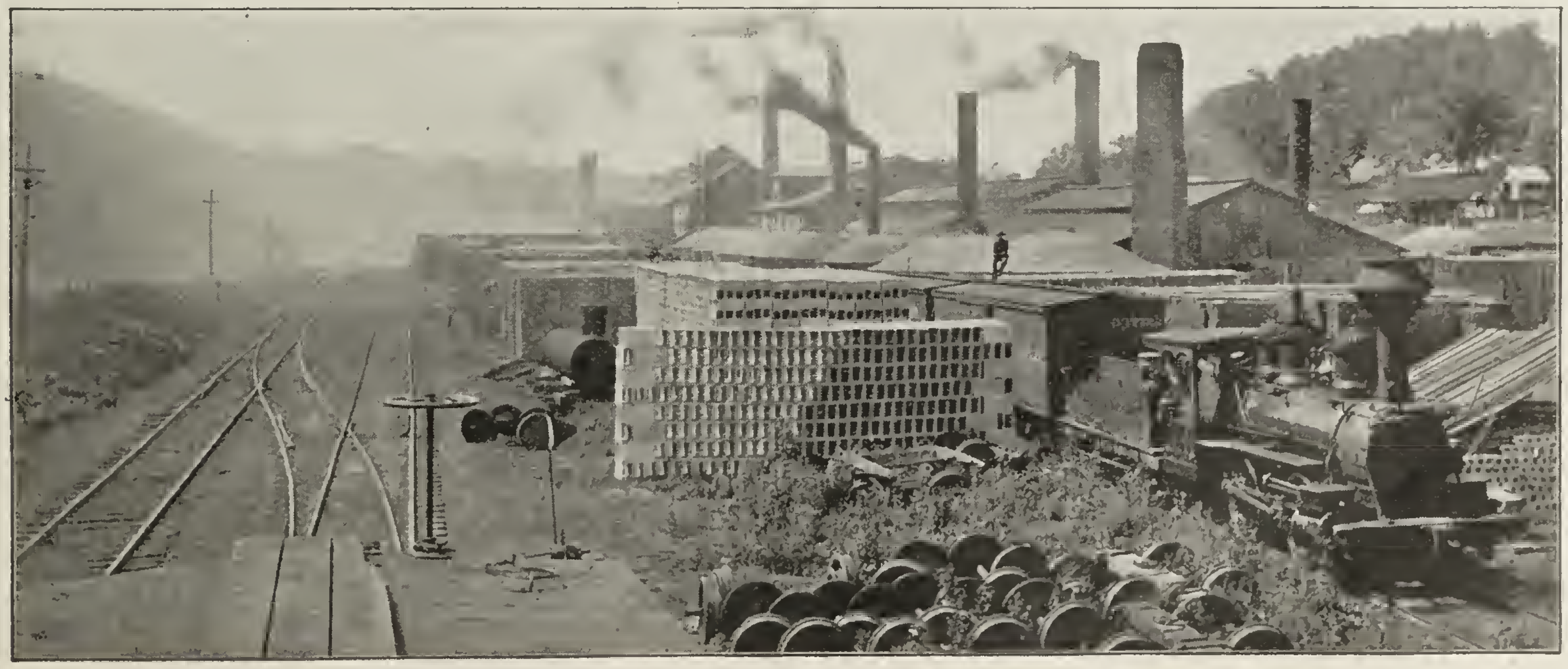
Their celebrated fire-proof construction is being used extensively in the largest and finest buildings of the present time. It is made from the Mingo clay, before mentioned, and is burned to a degree that renders it practically indestructible by fire.

—Salt-Glazed Building Brick.—

These two factories thus hastily described are but a part of the works conducted by this firm. At Logan, a very few miles north of Haydenville, is siuated a plant incorporated in 1890 as the Hocking Clay Manufacturing Co., the interest of the two concerns being identical. Here they are making a novelty in building materials, that of salt-glazed bricks and blocks. They are obtaining some of the most beautiful effects, which are winning for the ware a rapidly growing favor among architects.

In Columbus they have their own rolling mills, machine shops, foundry, etc., which enables them to manufacture the necessary clayworking machinery and dies used in their factories.

To leave the Haydenville plant without making mention of the town would be leaving our story unfinished. Pullman has had his "dream" of a model town broken, and the promoters of the "model city" at Niagara Falls have met with bitter disappointment, but the Haydenville Mining and Manufacturing Co. have about their works a "Pullman dream" and a "model city," which has in it every element of happiness, stability and sobriety. It has connected with it about 125 families or about 700 people. The lands and improvements belong to the company. The town is not incorporated. It has its churches, schools, etc., but unlike other towns, especially those in mining districts, it has no saloon. The village has telegraph, express and railroad facilities, and, in fact,



View of the Haydenville Mining and Manufacturing Co's Plant.

it has every semblance of an incorporated town. The surrounding scenery is picturesque, and to one living in a city invigorating and restful. Its people are intelligent peaceful and happy; its government is perfect, even without an officious mayor—a thrifty, prosperous community within the gates of which visiting clayworkers are always made welcome.

ROSS C. PURDY.

OFFICIAL ANNOUNCEMENT AND PROGRAMME.

The Thirteenth National Conventional of Brickmakers to be Held at Columbus, Ohio, February 7 to 10, 1899.

THE THIRTEENTH ANNUAL CONVENTION of the National Brick Manufacturers' Association will be held at Columbus, O., Tuesday to Friday, Feb. 7 to 10, 1899. Ohio is the greatest clayworking State in the Union. Her capital city is the home of the School for Clayworkers. Thus it is meet that the members of the N. B. M. A. should gather there from all quarters of the Nation.

—Headquarters During Convention.—

The meetings will be held in the Convention Hall of the new Great Southern Hotel, which will be headquarters during the Convention. The Great Southern is a new and strictly fireproof hotel, luxuriously furnished and equipped with every modern convenience for the comfort and safety of guests. A special rate of $2.50 per day will be made to delegates and those accompanying them for ordinary accommodations. Where a single guest occupies a room, or if a room with bath or other special accommodations is required, the rate will be $3 to $3.50, according to location. Those who will be accompanied by ladies are especially requested to notify the hotel in advance of the character of accommodations desired, date of arrival, etc., etc., so that suitable reserves may be made.

—Exhibition Hall.—

Exceptionally satisfactory facilities have been provided for the exhibition of specimen brick, terra cotta, models of clayworking machinery, kilns, dryers, trade literature, etc., in a large hall adjoining the Convention Hall. Space will be free to all members of the National Association. There will be no charge whatever in connection with these exhibits, but EACH EXHIBITOR WILL BE REQUIRED TO CLOSE OR LEAVE HIS EXHIBIT DURING THE HOURS THAT THE CONVENTION IS IN SESSION. This rule is made imperative by the proximity of the exhibition and Convention Hall. Those desiring space are requested to notify the Secretary. Exhibits should be shipped in shipper's name, care Great Southern Hotel, in time to reach Columbus Monday, Feb. 6.

—Reduced Railroad Rates—

Have been secured on the certificate plan; that is, delegates and those accompanying them, if they pay full fare going, and take a certificate for same from the ticket agent, will be entitled to return ticket at one-third the regular fare, making two-thirds rate for round trip. Those starting from small towns should make inquiry of local ticket agent a few days in advance to insure the receipt of proper certificate. Where same cannot be obtained, however, a receipt from the ticket agent, bearing OFFICIAL STAMP OF TICKET OFFICE, and stating that it is for full fare and in lieu of regular certificate, will suffice. THOSE DESIRING CERTIFICATES SHOULD PRESENT THEMSELVES AT THE TICKET OFFICE AT LEAST THIRTY MINUTES BEFORE DEPARTING OF TRAINS. These tickets will be good three days before and three days after Convention.

The following is the programme so far arranged:

PROGRAMME.

—First Session, Tuesday, 2:30 p. m., Feb. 7, 1899.—

Prayer by Rev. ——————.

Enrollment of New Members and Roll Call.

President's Annual Address.............Wm. Flinn, Pittsburg

Report of Treasurer............Jno. W. Sibley, Coaldale, Ala.

Glimpses of the Great Southern Hotel, Columbus, Where the Brickmakers will Congregate February 7th.

Election and Installation of Officers.

Appointment of Committees.

Address—"The Trade Situation"..C. G. Barkwill, Cleveland, O.

General Discussion, led by..John F. Burnham, Milwaukee, Wis.

—Tuesday Evening, 8:30 o'Clock.—

Informal reception and collation in the banquet hall of the Great Southern Hotel, tendered by and given under the auspices of the Columbus Board of Trade.

—Second Session, Wednesday, 9:30 a. m.—

"The Commercial Side of the Brick Business"...........
.........................T. P. Plumridge, St. Louis, Mo.

Report of Committee on Statistics and Value of Brick as a Building Material................................
..........W. C. Ogden, Chairman, Port Dickinson, N. Y.

"Burning Brick in Down-draft Kilns"..................
.............................Robert Twells, Wickliffe, O.

—Questions for General Discussion.—

Is it possible in practice to get perfect combustion in fuel?

The New Great Southern Hotel and Theatre, Columbus.

Is it practicable to use pyrometers in brick burning?

Which is the most exact method of burning: settle, test pieces or Seger cones?

Are vitrified building brick in any way superior to those not vitrified?

—Third Session, Wednesday, 2:30 p. m.—

"What I Don't Know About Brickmaking".............
............................Wm. Morrell, Gardner, Me.

"The Evolution of the Paving Brick"..................
..........................H. A. Wheeler, St. Louis, Mo.

Report of the Committee on Technical Investigation.....
.......Prof. Edward Orton, Jr., Secy., Columbus, Ohio.

—Questions for General Discussion.—

Is a lien law a real or a fancied protection to brick manufacturers?

Is it more expensive to make brick in winter than in summer?

What is the most economical method of mining and preparing clay for the dry-press process?

Why not place in the hands of the Investigating Committee for the ensuing year the subject of "Efflorescence?"

—Fourth Session, Thursday, 9:30 a. m.—

"Brickmaking as a Profession"....J. Fred Smith, Omaha, Neb.

"The Utility of Clay as a Roofing Material".............
..........................Chas. T. Harris, Alfred, N. Y.

"Coloration of Architectural Clay Wares"..............
..........................A. V. Bleininger, Columbus, O.

"Modern Methods of Drying Brick"....................
.............................J. W. Tester, Montreal, Can.

—Questions for General Discussion.—

Will oil of any kind used on repress dies cause whitewash on brick?

With a dryer 100 feet long, with a 40-foot by 2-foot square stack to each tunnel, and utilizing waste heat from kilns, using a blower, are the conditions for drying improved by having the doors open at end where brick are put in, which are nearest the stacks?

In a dryer utilizing waste heat from cooling kilns and using an exhaust fan how can the heat be more evenly distributed, heat going into the dryer at 300 degrees at one end, only registering 100 degrees at the other end, heat being put in through one tunnel under dryer cars, each tunnel getting its pro rata?

What is the cause and what the remedy of the seam in the face of dry-press brick?

Can face-brick manufacture be made profitable on an investment of less than $100,000?

—Fifth Session, Thursday, 2:30 p. m.—

"Some of the Faults of Modern Clayworking Plants"....
..........................Anders Persson, Bangor, Me.

"The Clay Age"..............W. H. Kriegshaber, Atlanta, Ga.

"Profit and Loss in Brickmaking"......................
.........................John Miller, Washington, D. C.

—Questions for General Discussion.—

What effect does the washing of clay have (1) upon its physical qualities? (2) Upon its chemical composition?

Does it pay to wash clays for brick and terra cotta, and what does washing cost?

What is the effect of weathering clay upon the efflorescence of brick?

Does it pay to weather clay?

Can thorough pugging take the place of weathering?

Reports of Committees.

Miscellaneous Business.

Note.—No papers or essays not included in the regular programme will be heard unless previously submitted and approved by the Executive Committee. At the close of each essay or address the subject under consideration will be fully discussed. All formal resolutions should be presented in writing.

—A Day at the Clayworkers' School.—

Friday, at 10 a. m., there will be a ride about the city under the guidance of the Committee on Entertainment, ending at the University, where a reception will be tendered the visitors by the University officials. Lunch will be served, after which the visitors will be conducted through the various buildings and departments by Professor Orton and his pupils.

—Membership Badge.—

Each member of the Association and accompanying ladies will be presented with an appropriate souvenir badge, the gift of the Columbus brickmakers, which will of itself be the "open sesame" to all entertainment and social features.

Brickmakers of America are each and every one cordially invited to attend the Convention and participate in the deliberations. Those from across the water, if any there be who can attend, will also be made welcome.

Those desiring information relative to requisite of membership, etc., are requested to address the Secretary at Indianapolis.

THE EXECUTIVE COMMITTEE,
T. A. RANDALL, Secretary. WM. FLINN, President.

Written for the CLAY-WORKER.

ANGLO-AMERICAN POTTERY. No. 10.

Printed Designs Relating to America, by Old English Potters.

BY EDWIN ATLEE BARBER.

SCRIPTURAL SUBJECTS.

ALTHOUGH NOT properly coming within the scope of this work, it has been deemed advisable to insert here as full a list as possible of printed Biblical potsigns produced by the Staffordshire potters, for the reason that many American collectors have recently turned their attention to them. While they were not intended for any particular section, large numbers of them have found their way to this country, and it is only a question of time when they will find a place in the majority of public and private collections. Even now there are those who have commenced the systematic collection of this interesting and attractive class of ceramic prints.

It is evident that the old English potters published a great variety of these designs, but as they are generally regarded by their owners with greater veneration, and held more tenaciously, than pieces which are characterized by decorations of a more secular nature, we can only expect to present here an enumeration of such as have incidentally come to light during our search for "American views." The list may be enlarged as our knowledge increases.

ENOCH WOOD & SONS.

—Designs in Dark Blue. Border, Sprays of Flowers Alternating with Groups of Scriptural Emblems, Inclosed in Scroll Medallions.—

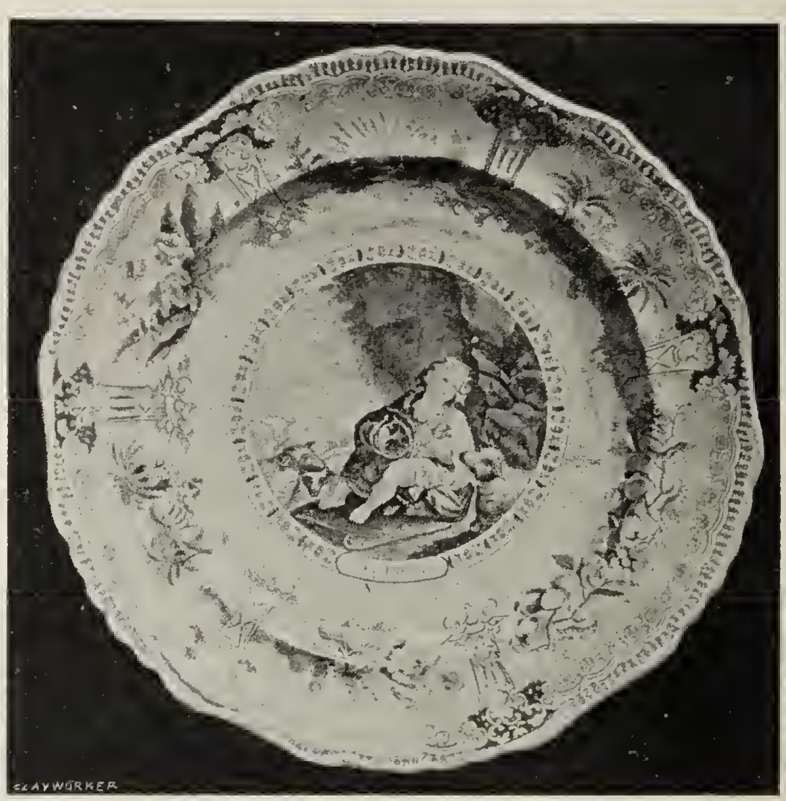
The Death of Abel.
Jacob and the Angel (from Gen. xxxii, 24-30).
The Nativity.
The Coming of the Wise Men.
The Flight Into Egypt (from Matt. ii, 13-14).
The Return.
Christ and the Woman of Samaria.
Peter in the Garden (from Matt. xxvi, 74).
Scene from Revelation (from Rev. vi, 2-4).

—Designs in Dark Blue. Border, Floral Sprays and Altars, three of each. (Maker unknown.)—

Tomb of Jeremiah.
Tschiurluk.

—Design in Dark Blue.—

Rebekah at the Well (from Gen. xxiv, 45).



St. John, ("The Sun of Righteousness" Series.)

—Designs in Red, Brown, Black, Purple, etc. Border, Panels with Fruits, Flowers and Sheaves of Wheat; Rising Sun at Top. ("Son of Righteousness" Series.)—

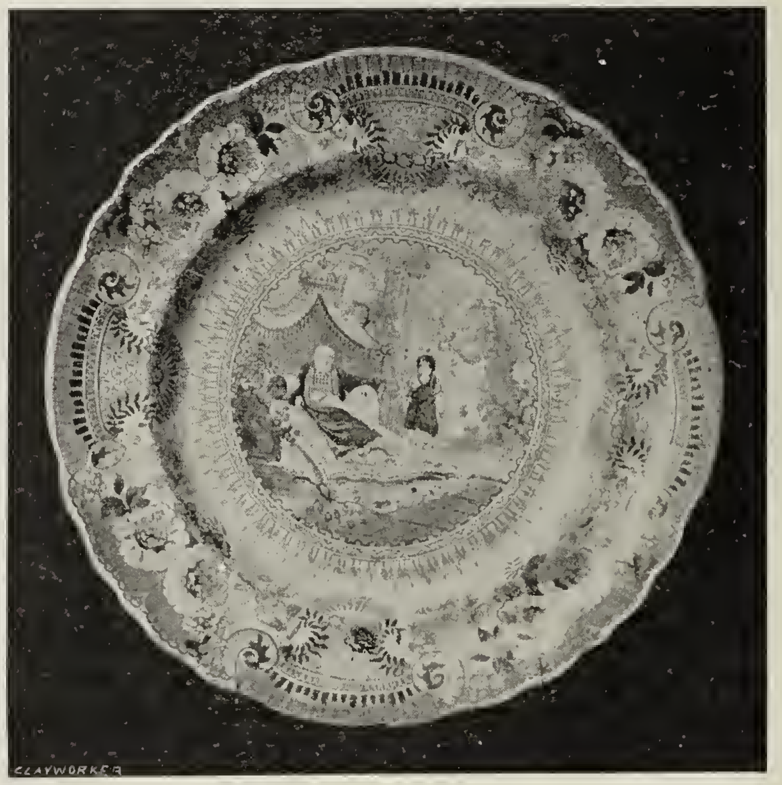
St. John, Infant and Sheep.
Little Samuel, "Speak, Lord, for Thy Servant Heareth."

K. E. B.

—Designs in Red, Brown, Black, Purple, etc. Border, Floral Design and Four Large Fan-shaped Ornaments.—

"Scripture Illustrations."

The Call of Samuel (I Samuel iii).
The Faith of Abraham (Genesis xxii).



The Call of Samuel. By K. E. B.

C. J. MASON & CO., HANLEY, ENGLAND.

—Designs in Brown, Light Blue, Pink, Black, etc. Border, Groups of Women, Camels and Urns. Long Inscriptions on Back.—

Laodicea (from Colossians ii, 1, 4, 16).

Mount Zion (from Micah iii, 12; incorrectly given as Matt. iii, 12).

Nineveh (from Zeph. ii, 13-15).

J. & J. JACKSON.

—Designs in Pink, Brown, Black, etc. "Holy Bible Series.—

Tadmor in the Desert.

—Designs in Brown, Light Blue, Black, Pink, Purple and Green. Border, Fruits, Flowers, Sheaves of Wheat and All-Seeing Eye.—

Millennium. (This design is said to occur also in Dark Blue.)

—Designs in Purple, Pink, Green, etc. Border, Six Groups of Flowers, with Floral Lacework Between.—

"Fountain of Elisha at Jericho."

"Tomb of Absalom. Village of Siloam. The Brook Kedron."

ADAMS.

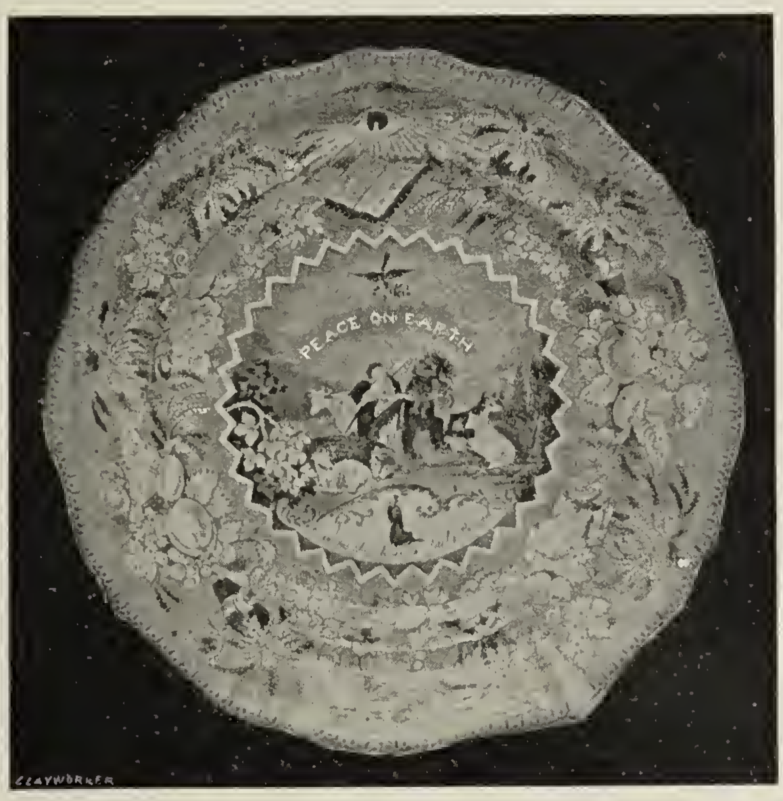
—Designs in Medium Blue, etc. Border, Four Panels, with View of Oriental City, Alternating with Groups of Flowers.—

Palestine.

JOHN RIDGWAY.

—Designs in Light Blue, Green, etc. Border, Four Irregular Scroll Medallions Inclosing Buildings.—

Palestine.



"Millennium" Plate.

WILLIAM RIDGWAY.

—Designs in Brown, Green, Light Blue, etc. Border, Floral Wreaths Inclosing Temples, etc.—

Damascus.
Iconium.
Joppa.
Sidon.
Tyre.

J. & G. MEAKIN.

—Designs in Black, Rudely Colored by Hand. Border, Lily of the Valley, Wheat Head and Tulip in Relief.—

The Child Jesus Preaching to the Jews (from Luke ii, 46-52).

DILLON.

—Designs in Red, etc. Border, Serrated Design Surrounded by Small Flowers.—

Abraham Sacrificing Isaac.

—Designs in Black, Rudely Colored by Hand. Border, Raised Alphabet, in White. ("Sacred History of Joseph and His Brethren" Series.)—

"Joseph Sold by His Brethren to the Ishmaelites."

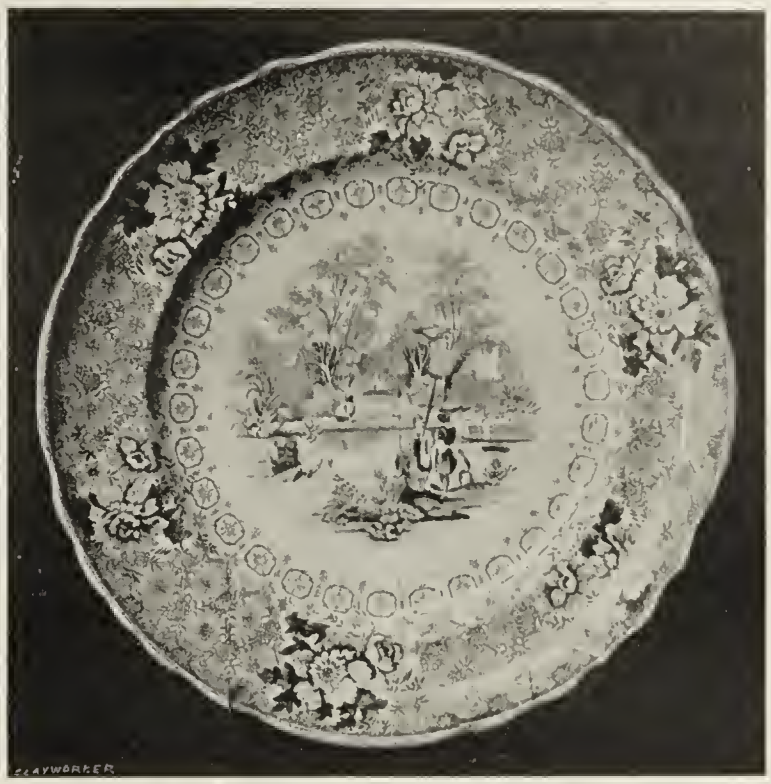
"Joseph's Brethren Applying to Him for Corn in Time of Famine."

MISCELLANEOUS SCRIPTURAL DESIGNS.

—Designs in Black, Rudely Colored by Hand. Various Borders.—

Cain and Abel.

The Adoration of the Magi: "Where is He that is born King of the Jews, for we have seen His star in the East."



Fountain of Elisha.

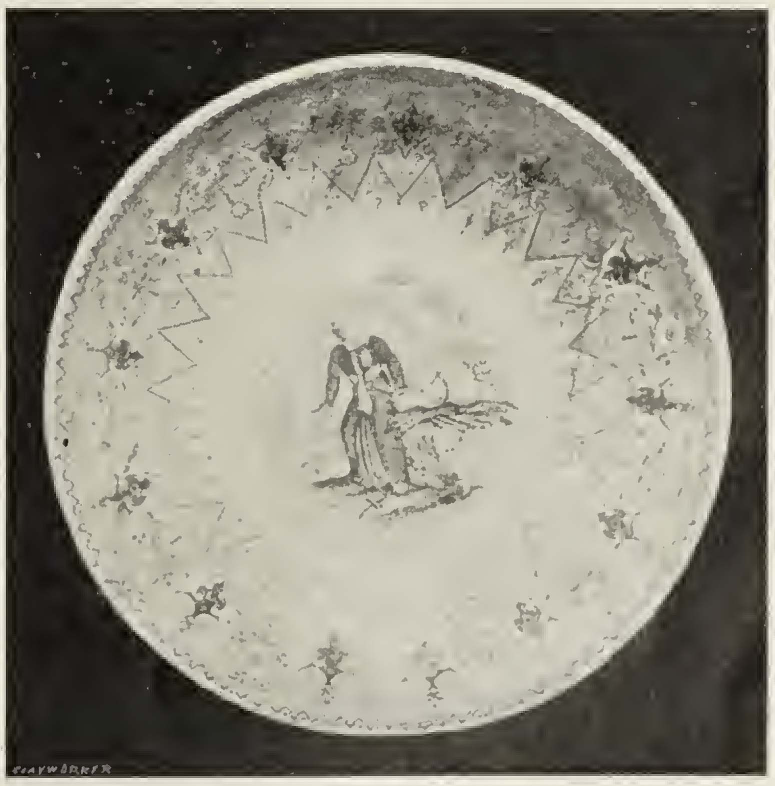
Samuel Anointing Saul (from I Sam. x, 1).

—Design Painted in Red on Porcelain (copper luster).—

Moses in the Bullrushes.

CENTENNIAL DESIGNS.

It is not possible to fix exact dates marking the beginning and ending of the manufacture of certain distinct classes of Anglo-American pottery. It is sufficient for all purposes, however, to know that the production of Liverpool cream ware, with black, brown, green and red printed designs relating to America, extended over a period of some twenty-five years, from about 1790 to 1815. The black printed and lustered cream ware and the dark blue china of the Staffordshire potteries began to take the place of the Liverpool products soon after the war of 1812, and blue printed china continued to be manufactured until about 1830, covering practically a period of fifteen years. This ware, in turn, was gradually superseded by the Staffordshire crockery, with prints in various colors—red, green, light blue, black, brown and purple—which



Abraham Sacrificing Isaac. By Dillon.

was made in great abundance for at least fifteen years longer, or down to about 1840. The china produced after that time is regarded by collectors as too modern to deserve special attention, yet there were a few designs prepared by English potters in commemoration of the Centennial Exposition of 1876, which, sooner or later, will be in demand on account of their historical value.

MESSRS. F. & R. PRATT & CO., OF THE FENTON POTTERIES, STOKE-ON-TRENT.

—Designs in Colors. Border, Solid Groundwork—Magenta, Turquoise Blue, etc.—with Margin of Filigree Gold Work.—

"The State House in Philadelphia, 1776."
"Philadelphia Public Buildings, 1876."

Similar designs were made by other English potters, among which may be mentioned:
Memorial Hall (Art Building, Centennial).

MESSRS. W. T. COPELAND & SONS, STOKE-ON-TRENT.

This firm manufactured a great abundance of "Centennial Memorials" in opaque pottery and porcelain. The decoration consisted of a medallion head of Washington printed in black, supported on either side by a United States flag and surmounted by the American eagle, touched by hand with natural colors. Beneath the design is printed "George Washington, 1776." Whole table services, vases, mugs, loving cups, etc., were so decorated, having been manufactured solely for the importing firm of J. M. Shaw & Co., New York.

MISCELLANEOUS AMERICAN DESIGNS.

(Other than English.)

—Design in Black, or in Brown and Black. Border, Handsome Wreath of Fruits. (Made at Creil, France, about 1830.)

Washington (Portrait), from Stuart's Painting.

PETRUS REGOUT, MAESTRICHT, HOLLAND.

—Design in Light Blue, etc. Border, Large Stars in Firmament of Small Ones.—

Harrison, Log Cabin ("Columbian Star"). Copied from John Ridgway's Design, No. 100.

FOREIGN VIEWS.

—Designs in Dark Blue.—

American collectors have paid but little attention to ceramic prints of foreign subjects and no effort has been made to catalogue them. A large number of British views have already turned up in the United States, and it is probable that they will be found to be more abundant in this country than in England, where they have been largely absorbed by those interested in their preservation. Some of these designs are as beautiful as any produced for the American market, yet, because they are in so little demand among collectors on this side of the Atlantic, except as fine bits of coloring for effective wall decoration, the prices they command at present average little more than one-tenth of those paid for American views. As interest increases in the general subject, however, these neglected examples of dark blue china will gradually find a place in the cabinets of many American collectors, for whose benefit the following subjects are noted as a nucleus for a more complete list to be compiled later:

Beaumont Lodge.
Blenheim Castle, Oxfordshire.
Bothwell Castle, Clydesdale (Adams).
Eaton College.
Faulkstone Hall, Essex.
Fonthill Abbey, Wiltshire (Bluebell Border).
Fonthill Abbey (Grapevine Border).
Gunton Hall.
Hollywell Cottage, Cavan.
Kingsweston, Gloucestershire (Riley).
Liverpool (Wood).
Langley Park.
Morpeth Castle, Northumberland (Adams).
Scaleby Castle, Cumberland.
St. Philip's Chapel, Regent Street (Wood).
Southampton, Hampshire.
Thrybergh, Yorkshire.
Villa in the Regent's Park, London (American Eagle and Shield on back).
Wells Cathedral.
Windsor Castle.
Worcester (Herculaneum Pottery, Liverpool).
York Minster (with vessel flying United States flag).
Zoological Garden (probably London), by Clews.
Zoological Garden (by P. W. & B.)

MISCELLANEOUS FOREIGN VIEWS.

—Dark Blue.—

Cape Coast Castle on the Gold Coast, Africa (Wood).
Christianaburg, Danish Settlement on the Gold Coast of Africa (Wood).
Calcutta (Wood).
Cowes Harbor (Wood).
Fakeer's Rock.
Italian Villa.
St. Peter's, Rome.
Sebastopol.

ON THE EXCHANGE OF DUPLICATES.

There is no more satisfactory method of increasing one's collection of Anglo-American pottery than by exchanging duplicate specimens with other collectors. Those who have had any experience in negotiations of this nature must have realized the difficulty of reaching a mutual understanding on account of the insufficiency of information furnished by the average correspondent, which usually results in vexatious delays, dissatisfaction or the abandonment of a promising exchange. Frequently the most important points are overlooked in written descriptions, such as the condition of pieces, the exact shape or the character of the border design, which is often the only feature that will aid in identification. The following suggestions, covering all essential points, are offered to secure uniformity in the description of specimens:

PLATES—

1. State exact title of design (when given); accurate description of central engraving (when not).
2. Color of print.
3. Exact diameter.
4. Shape, whether deep (soup), or flat (shallow).
5. Explicit description of border devices (a simple reference to the number will suffice, if found in this manual).
6. Exact inscription on back, with maker's name or initials, when given.
7. Condition of piece, whether proof (absolutely perfect), scratched, worn, discolored, chipped or cracked.

PITCHERS—

1. Title.
2. Color.
3. Height.
4. Shape (number of type).
5. Condition.

Where a number of designs are to be described the work would be greatly simplified and facilitated by the use of a blank form, with headings prepared in accordance with the above suggestions.

NOTE.—This ends the series of papers on "Anglo-American Pottery." They will be arranged, enlarged and reprinted in book form as a manual for collectors. As the edition will be limited, those desiring copies are requested to send in their orders as early as possible. The book will probably be ready for distribution in February. Subscriptions should be sent to T. A. Randall & Co., The Clay-Worker, Indianapolis, Ind. Subscription price, $1.50 per copy. By mail, 10 cents extra.

AN UNDEVELOPED CLAY FIELD.

Editor Clay-Worker:

As the Clay-Worker is published for the benefit of parties interested in the clay industries in this country, I desire to call attention to this locality as offering exceptional facilities for manufacturing dry-press brick. Our common clay and potters' (white) clay, mixed in different proportions, burn a beautiful dark and light chocolate; also a beautiful gray. The potters' clay makes a white brick, and finishes burning at 2,500 degrees. Brick stand well at 3,000 degrees of heat. The above has been demonstrated by actual test. The expert says that the clay is most excellent, and that by mixing the common and potters' clay many other natural and desirable colors may be produced. The expert further says that street-paving brick and fire brick can also be made here, as well as shapes, tiling, etc. Local capitalists have no experience in any way. No such brick as these are made anywhere on the line of the Illinois Central Railway. I desire to correspond with capitalists who are interested in these matters and desire to enter a new field. Will take pleasure in giving them any desired information. Yours truly, B. A. NEALE.

Mayfield, Ky.

COST OF CLEANING BRICK PAVEMENTS.

The organ of the New York Reform Club Committee, Municipal Affairs, published quarterly, has, in its last issue, a very interesting and complete report upon the reforms effected in cleaning the streets of the city. By this it is shown that the ease with which certain types of pavement can be kept clean, as indicated by careful observations of the cost of doing the work, is as follows: Asphalt, 100; brick, 100; wood (smooth karri), 100; granite, 150; Belgian blocks, 160; cobble stones, 400.

All the pavements were in good condition, and the accuracy of the table was checked by comparison with the number of sweepers actually employed in each subdivision in the city. For the entire city 1,623 sweepers were employed, each sweeper keeping clean an average of 5,746 square yards, at an average cost of $2.40 per 1,000 square yards a week; indicating, according to the estimate, that asphalt, brick and smooth karri wood paving could be kept clean at sixty-nine cents per 1,000 yards per week.

A brick pavement, when properly laid, is not a noisy pavement, it is a good and smooth road for traction purposes or for bicycling, while it affords a better foothold for horses than asphalt does, it is more than ten times as durable; it is lower in first cost, incomparably lower in cost of maintenance, and the New York report proves incontestably that, in the important matter of cleaning, the brick pavement is in no way inferior to asphalt; therefore, we cannot understand why the vitrified brick pavement is not universally adopted in all our cities.—Scientific American.

PAVING BRICK NOW EQUAL TO GRANITE.

Editor Clay-Worker:

For some time past I have had it in mind to write you and compliment the Clay-Worker on the good work you are doing for the cause of brick pavements. My excuse for delay is a good one. I have been very busy looking after our paving brick plants. We have two, one here at Danville and one at Quincy, and expect to run them both all winter, as we have plenty of orders. I was very glad to see the Clay-worker take up the street paving question. I indorse every word of the article in the October issue on the ten-year guarantee for brick paving, as brick have been in use long enough to give men who have such work in charge a chance to know a good paving brick. There are very few new works starting up these days, and all of the old paving brick plants that are now running have furnished miles of brick streets all over the country, and it appears to me that it would be money well spent if some of the city authorities who contemplate using brick would go and visit some of the places where brick streets have been in use for a long time and see how the streets are wearing, if they have not the opportunity to see them at home (and I cannot call to mind a city in the West that has not one or more streets of that kind). That proves where we are drifting. Brick paving will supersede all other paving. It will last longer than any material now used for paving, except granite, and I believe that we are now making paving brick that will equal granite.

When a brick pavement is laid there is no more expense on the street for from ten to twenty years, according to the amount of traffic on the street and the quality of brick used. As to the foundation, all brick men agree that the foundation must be solid in order to get good service out of the street. How the foundation is to be laid is a local question. There are now four kinds of foundations used in the West. First, four inches of sand and gravel well rolled, with one course of vitrified brick on edge. Second, six inches of broken limestone well rolled, with two inches of sand and one course of brick on edge. Third, four to six inches of gravel and sand, one course of brick, flat lengthwise of the street, with a cushion of sand one inch on top, and a top course of brick laid crosswise of the street. Fourth, four to six inches concrete, made of cement and broken rock or cement and screened coarse gravel. Strange to say that all of the above methods give satisfaction in the cities where they are used (providing the brick are good). I have always favored the two courses of brick, and I have not yet been converted to any other method, although the concrete foundation may be the proper thing for large cities; in fact, it is the only foundation I ever saw used in a large city; still, I think the two-course work would give just as good satisfaction on the same streets. The manner of laying brick now in use all over the West is this: The brick are laid in rows straight across the street and laid herring-bone at intersections (see Fig. 1, James Taylor's article in November Clay-Worker). The sand filler is still used by a large majority of the cities in the West; although it has its objections, it is the cheapest. A good cement filler, in my opinion, is the best. In conclusion, I will say that I wish the Clay-Worker was on the table, or, I should say, in the hands of every city engineer in the United States. J. G. SHEA.

Danville, Ill., Nov. 28.

THE FUEL QUESTION.

Of late the fuel question has been given more consideration than formerly, and, as a consequence, a number of new devices have been introduced for the purpose of economizing in the use of fuel. One of the latest and most promising inventions in this line is a gas producing, consuming and coking furnace, invented and patented by W. P. Grath, secretary and treasurer of the Illinois Supply and Construction Co., St. Louis. This furnace is peculiarly adapted to brick kilns either up or down draft, and is also applied to boilers, annealing furnaces, etc., and is now offered to clayworkers in connection with the Grath patent down-draft brick kiln, which was invented in 1895. Six of these kilns were erected by the American Hydraulic Press Brick Co. at their yards in Collinsville, Ill., where they have given wonderful results in burning pressed brick. When burning red pressed brick, these kilns burn a clear No. 10 shade on top, and a No. 3 and 4 shade on the floor. The burning is also uniform from side to side and front to back. The only brick in the whole kiln which are not suitable for the best quality of front brick are the first nine inches, which butts up against the rear wall, the front nine inches and the hangers on top, although these brick make an excellent quality of sidewalk paving brick, or a second grade of front brick. In burning colored brick such as buff and gray, the results are even more remarkable as shown from the last kiln of gray brick just burned by the above company, that they got over ninety-nine per cent. of brick that were sent direct to the building for first quality face brick. Eight of these kilns are also being used by the Green-Hunter Brick Works, at Thurber, Texas, where the results are equally as good, or quoting Col. Hunter's words from a recent letter, "Every brick that we put in our kilns comes out good enough to send directly to the building for firstlclass front brick if properly made."

Mr. Grath's gas producing, consuming and coking furnace, for which patents have been granted, was also tested by the American Hydraulic Press Brick Co. A delegation of St. Louis brickmakers were invited to go and see the furnace in operation. Every one of the party were very much surprised at the splendid results, and all declared that the working was so simple, and the results more than was claimed for it. In this furnace nothing but the cheapest grade of slack coal is used, from which the gases are first extracted and consumed, leaving a mass of red-hot coke, which is then shoved over on to the grates and burned. The incandescent heat from this coke ignites and burns the gases from the fresh supply of slack, which is then put on the gas or coking tables. Sixteen of these furnaces were used on the kiln, and were operated by two firemen or burners. After starting a fire in those furnaces no black smoke whatever came out of the stack, thus showing that all the gases generated are consumed and the combustion was perfect.

Evidently there is a great future for this furnace, and we think it would be advisable for any one in the manufacture and burning of clay products to correspond with the Illinois Supply & Construction Co., St. Louis, Mo., for further information. A cut of the furnace and kiln may be seen by turning to page 85.

THE ILLINOIS CLAYWORKERS ASSOCIATION'S ANNUAL CONVENTION

THE PEORIA CONVENTION.

Tile and Brickmakers Tell of Prosperity—A Large Attendance—A Royal Welcome and a Jolly Good Time.

THE Twenty-first Annual Convention of the Illinois Clayworkers' Association was called to order by President Townsend at 10:30 o'clock Tuesday morning, January 17. Forty-six members had been enrolled on the membership list, deposited their dollars and received in return a pretty badge and a neatly-printed invitation to the banquet tendered by the Peoria brickmakers.

The latter were in evidence early in the engagement. Headed by Mr. J. C. Madigan, they bade all comers a hearty welcome, and by cordial greetings made the visitors feel that they were more than welcome.

The sessions were held in the assembly room of the new City Hall, a fine structure but recently finished, of which Peoria citizens are justly proud. The assembly room is exceedingly cheerful and cozy, and the clayworkers were the first to use it.

Immediately following the call to order, Secretary Stoll read a number of letters from absent members.

President Townsend: The first in order is the report from members of the past season's work.

TRADE: PAST, PRESENT AND PROSPECTIVE.

William Stare, Mendota: The past season I had a better trade than the year before. I built three new kilns, and have quite a large stock on hand, but I am not going to have enough to supply the demand this spring for tile. The brick trade at present is very dull, but I think there is going to be quite a big demand this spring. Several large buildings are going to be put up in our town, in one of which they will use 600,000. They are going to build a large hotel of brick, and I think we are going to have all we can do the coming season. Prices have been a little lower on brick; tile have been about the same.

Andrew Harrington, Galesburg: We have finished one of the best years we have had since 1892. Ran night and day all through the summer, and have prospects for a good business next season—much better prospects than this time last year.

George J. Walters, Chatsworth: Business has been very good. Last year was the second best I have ever had. I have been in the business about seventeen years. I made about 800,000 brick and about the same tile. I made 1,040,000 pieces of ware. I should have a million brick made, for I won't have enough to supply the demand in the spring, and the tile will all be sold before spring opens.

A. Solfisburg, Aurora: We made about 3,000,000 brick last year and sold about 2,500,000, and have orders enough in sight to sell the balance. We got better prices the past year. The tile trade was nothing extra.

President H. F. Townsend.

Thomas Trainor, West Chicago: I had a very successful year, with good prospects for the coming season.

William Simpson, Chicago: Our business has been fair, but the manager for H. Brewer & Co. is here, and he can tell you more about it.

C. C. Barr, Streator: We have had the best year we have had since we were in the business. Started about the middle of March and closed the last day of December. We have fewer brick on hand now than we had when we started up in the spring. We get better prices now than last year, but we can stand another raise. Prospects are good for the coming season. We make mostly paving brick. We made about 10,500,000 brick, all told.

E. M. Freese & Co., Galion: About the same story. Three or four years ago the brickmakers were blue. The machine men claimed they were happy, but they were blue. Now the brickmakers are all smiling, and the machine men look wise and do business just the same.

F. A. Martin, Mazon: Business has improved. We had the best year since 1892, and I think the prospects are good for the coming season. We make tile and common brick.

Mr. Tillbury, Towanda: The tile business has been a little dull. We made about one-third more than last year and sold them.

W. T. Ball, Carbon Cliff: I am a new hand at this business. Our business last year was far better than it had been before. Prospects are good for the coming season. Our product is mainly fire brick. We make some common brick, sewer pipe and drain tile.

A. R. Batley: I can only repeat the words of the Frost Manufacturing Co. The year closing with 1898 was the best year we have had since 1892—the only year in which we have paid a dividend since 1892. The business in 1898 increased 48½ per cent. over 1897. My impression is that business is better from New York to New Orleans, and points in Texas to the lakes.

G. H. Wessels, Crescent City: Business has been very good. Two years previous it was quite dull. Business for next year looks very bright.

D. T. Lorriaux, Ottawa: Business has been very good with us this fall. We are mostly engaged in the manufacture of fire-clay products. Make some paving brick and some sidewalk tile.

J. D. Jensen, Pekin: Business has been very good—all we could do.

William Hammerschmidt, Lombard: We had a better year than we have had for the last four or five years. Prospects good to sell all the ware we have made. We have some tile we have had stored up for years, and we expect to sell them all out before the close of the winter.

C. O. Swift, Waverly: This is something new to me. This is my first year's experience in the work. It has been very successful. We bought in the business last spring. We manufactured nothing but tile last season.

E. M. Pike, Chenoa: I have sold my plant and retired from that branch of the business, and I am now devoting my time to other things. But, as my successors are not here, I presume I should report for them, Messrs. Steinburg & Houk. They are running my old concern—my pet that I have run for years. The question is whether separating me from my tile plant would prevent me from coming to brick and tile conventions. If it does I will buy another, for I cannot keep away. I will say that the tile trade has been one-half better than it has been with me for the last two years. Their trade has been splendid—I do not say booming, but better than for years. I am on the other side now—I am the buyer, and I am jewing the tilemaker down, and I want three years' time without interest, and three-inch tile for the price of two-inch, and I tell them the tile are not very good, and I am up to all the little schemes that used to be played on me in that line. Now, I am stretching that a little. There have been some very bad things played on me, and I do not think it right.

A Member: Tell us about the tile you have been putting down on your Indiana farm. Have you realized any benefits from it as yet?

Mr. Pike: Benefits mean results. I have not got a single result. I have not made anything so far from drainage. But it will come. I can wait. I am getting the soil in good condition. I am getting some strings laid, and, as soon as the weather changes, we will finish laying about twelve miles of tile. It pays.

H. F. Townsend, Avon: I can say, as most of the brethren have said, my only regret is that we cannot make more, for we have had to turn away orders. We have been running every day all fall and winter, and are running now, and I am actually afraid we are going to run out of material again this spring. From all we can hear we are going to have as good a year as we had last year. We make drain tile and brick.

J. W. Kirkpatrick, Litchfield: Our trade is better than last year, but still it is not as good as we would like to have it. Tile trade was pretty good this year, and prospects are good.

E. Rogers, Alton: Last season was the best we have had for years, and the prospects are fine.

J. C. Madigan, Peoria: Here in Peoria we manufacture a great many brick. We have a good business all the time, week in and week out, year in and year out. Others on the outside can sell brick cheaper than we can. Whether they make any profits is something we do not know. They advocate making a very large brick, and sell them for a very little money. Times are good here all the time. We are selling brick every day, and we are making them. We do not make enough brick to supply the demand. We cannot sell them as cheap as the outside people can put them in here. We have not got a machine here that makes brick big enough. We work the Brewer, Simpson and Henry Martin's machinery.

W. A. Eudaly, Cincinnati: I can say this is the best year we have had since 1898. (Laughter.) My business is good. I have always had all I could do and do it right in this country. Now that our borders have been extended so much, taking in those islands of other countries, the inquiries I am receiving from those places are very encouraging. I hope to do quite a good business. I hope, by getting on the field early, and now I have every indication of so doing, of getting into the Philippines before my competitors. I expect to sweep the whole thing up. There is no jest about this. There is business in these warm climates, just as well as in these cold regions, so I feel this is business in which you are all interested. If not, I wish you were. I will refer a little to my farm. I am a good, honest farmer. I do not annoy these tilemakers about their prices. I pay them what they ask. I have to do it or I don't get the tile. I put in quite a lot of drain tile this last year. Every time I come to the Convention, Brother Pike tells about having bought a farm and put in drain tile and all that sort of thing, and I go home and tell my wife what Pike has done, and she says, "Well, buy another farm and put in drain tile," and this is about all there is of it. I can't stand this thing much longer. I will either have to stop coming to these conventions or Pike will have to stop telling about his farms. I can't hold out much longer. I bought a farm this spring. I don't buy great, big farms, like Pike does. I look after my farms. I go out on them, and see the effect of the drain tile on the crops, and my experience in the last year with underdrainage has been beyond anything I had ever heard even the most sanguine claim for it. I drained land that it was said could not be drained, and I raised enough corn on that ground that heretofore no corn had been raised on to more than pay for the underdrainage. I sold the corn and got the money for it. That is what I consider results. I have not attended an Illinois clayworkers' convention for years where the reports have been so gratifying. I have not heard a single whine this morning.

Hon. John Warner, Mayor.

T. A. Randall, Indianapolis: I am a good deal in the shape of an Irishman a friend tells about. He had been attending a meeting of Hibernians, and one night the hotel took fire. He was very much frightened. Telling his experience the next day he said, "I had a narrow escape. I ran through the halls trying to get out, but couldn't, for every door I came to was windy." (Laughter.) All the clay I work is paper. I think I can give Mr. Eudaly some encouragement in his dealings with the Philippinos. I am familiar with his chirography, and I believe the natives can read it just as well as I can. (Laughter.) I, like Mr. Eudaly, am very glad to hear the more cheerful vein of the reports of the members. The one topic now uppermost in the minds of all, it seems, is expansion. The most desirable thing for the clayworkers of this country is expansion of trade, supplemented with a little more expansion of prices. If I can say anything to the clayworkers of the country more important than another, it is to try and get together on prices; try to put your business in shape to realize something from the harvest time that is before you. The next year is going to be a year of harvest in all lines of manufacture—in clay as well as others—and if the manufacturers will use discretion, and try to put their business on a profitable basis, they will all have good reason to be thankful at the close of the year. The prospects are very flattering. The reports that come to us from all over the country are of the same tenor. Business prospects are very bright.

L. H. Martin, Dwight: Our business was about one-half more than the year before. We made about 200,000 tile and about the same amount of brick.

Elder & Dunlap, Bloomington: We made 4,000,000 brick and sold them all, and are behind on orders. We are working now to fill an order we got in the fall for the spring trade for about 2,500,000 brick. We have increased the capacity of our plant some, put in new machinery and built new kilns, and the prospect for next season is very good. In regard to the business of Elder & Dunlap in the screen line, it is very flattering. We have put screens in every State in the Union. We have not gone into the islands as yet, but since Brother Eudaly has spoken I feel encouraged.

F. E. Swift, Washington, Ia.: I started

last spring with about 600,000 brick in stock, made about 1,200,000, and now we only have about 75,000 on hand. Drain tile has been rather slow the latter part of the season, but it is picking up now, and we are getting inquiries for tile, and we are running on tile this winter, and we will have a good trade the coming spring.

H. Brewer & Co., Tecumseh, Mich.: Business with us for 1898 was very good. Our prospects for the future are very bright.

W. R. Cunningham, Frankfort, Ind.: I am not, like Mr. Pike, able to retire. I am still scratching the top of my head, and by the time I get it as clean as he has his I think I will be able to retire. Our brick business has been very satisfactory. The company recently issued dividends to the stockholders. Our machinery business was double what it was the year before. We have not been able to declare dividends since 1895 in this line, but the prospects for 1899 are very bright—brighter than for years.

Julius J. Koch, St. Louis: Attending conventions is a new thing for me, especially in the capacity of writing it up. I represent Windsor & Kenfield, of Chicago. From all that I can hear, the prospects in the brick business are very good.

H. L. Hix, Earl Park: After about fifteen years of experience with brick and tile, we retired from the business four years ago, but I had become so attached to the business that I could not remain out of it. I am here to say to our Peoria brothers that we can sell them machinery that will enable them to make brick as cheap as they can in Chicago.

J. P. Middlekoff, Paxton: Our business has been good for 1898. Sold our entire product, and have fair prospects for 1899.

T. Townsley, Alexis: Our season has been very flattering, compared with other years, and will continue so. We had a very good season, especially in tile. Brick trade has not been so good. Tile seems to be growing in favor all along. Everybody is clamoring for tile. All the farmers want tile this winter. We live in full anticipation of a good year for both tile and brick.

Secretary Stoll: This closes the list of members. President will now appoint the Committee on Resolutions.

President Townsend: I will appoint on that committee T. A. Randall, E. M. Pike and W. R. Cunningham. We will now hear Secretary Stoll's report on the work he has done the past year.

Secretary Stoll: I do not know that I have any report to make, unless it be in regard to the matters left in our hands last year. After considerable correspondence with the Secretary of the State Board of Agriculture we got his consent to have the pavilion that we used at the World's Fair given a permanent place in the State Fair grounds. It cost us $15 to have it placed on board cars and started for Springfield. Mr. Towsend went down to Springfield and saw to it that it was properly placed, and now the clayworkers of Illinois have a place where they may make exhibits free of charge each year. The only expense they will have will be the freight on the goods to and from Springfield.

Mr. Cunningham: I do not want to seem to criticise at the start, and I feel highly complimented and honored by being placed on the Committee on Resolutions, but at the same time I feel that there are other and young men that should be recognized in distributing the honors of the Convention. There is my friend Pike; he is posing as a young man; he is an Indiana farmer, and there is friend Randall, an Indiana editor, and I am an Indiana machine man. I think Indiana has carried off the honors of this appointment, and I feel that it ought to go to the young men or the old men of Illinois, and, with your permission, I will withdraw from the Committee on Resolutions in favor of some Illinois man.

Mr. Randall: Indianians are nothing if not modest, and I heartily second the modest proposition of Mr. Cunningham. We Indiana men do not want to be accused of hogging the ring over here in Illinois. I think you will do well, Mr. President, to put in our places Illinois brick or tile manufacturers. I will be glad to render any assistance I can to advance the interest of the Illinois clayworkers. I have been a member of the Association for years and years, and have never failed to respond to any call made upon me, but I think you can do better in this instance by appointing men from Illinois on this committee.

President Townsend: I am an Illinois man first, last and all the time. It never entered my head that these men were from another State, because we are all brothers here together. As the Indiana gentlemen decline to serve I will appoint in their stead Mr. Pennington, of Springfield, and Mr. Rogers, of Alton.

G. C. STOLL, Secretary, Wheaton, Ill.

Secretary Stoll then read a letter from Dr. Converse, of Springfield, expressing regret that, owing to the serious illness of a friend, he would be unable to be present.

After some discussion, it was decided to take up one of the papers on the afternoon programme, and Secretary Stoll accordingly read the paper on

HOLLOW BLOCK BUILDING VS. FRAME.

—By W. M. Lauer.—

Mr. President and Gentlemen of the Convention:

In taking up the subject of hollow building blocks, the writer is aware of the fact that many exhaustive papers have been written, dwelling upon the perfection and beauty attained in the manufacture of hollow building blocks or machine terra cotta. Handsome designs in water-colors, planned for the use of hollow blocks, are displayed in the catalogues of manufacturers of clayworking machinery, all tending to convey the idea that the manufacture of machine terra cotta had reached such a state of perfection as to make it available and practicable for architecturally exquisite residences and public buildings.

It is not the writer's intention to disturb the dreams and fancies of theoretical beauty, progress and perfection attained in the production of hollow blocks, but to show to what extent that theory has been verified in actual practice.

When the writer engaged in the hollow block business in Chicago as salesman for a prominent hollow brick firm, he was led to believe that the public had been educated to the use of this material, and that aside from plain and rock-faced blocks, sills, caps, belt courses, angles, special angles, radius blocks, window casings, special ornamental work and special shapes necessary to conform to an architect's plans, could and would be made when required. The trade here had been confined almost exclusively to furnishing foundations for frame houses. The writer started out with the idea of "expansion," intent upon furnishing the material for entire structures, and building some fine residences, such, for instance, as are shown in color in the catalougue of well-known machine manufacturers, with the following result:

After securing a contract for a hotel building requiring a large segment arch at main entrance, and other special work, we found we could not obtain the material as required from the factory, and were obliged to cancel the contract. After several experiments of similar nature, we learned that it was impossible to obtain material adapted to the architect's design, but that the architect must either adapt his ideas and his designs to the limited range of molds, designs and shapes, which the manufacturer finds it profitable to make, or use such materials as frame, brick, stone or hand-made terra cotta, in which he can obtain what he requires.

We were also advised by the factory that they would prefer to receive only orders for plain or rock-faced block for basement work, as there was no money in making molded sills, belt courses and trimmings. Being thus limited in furnishing such material as architects desired, we were obliged to look for such trade as could be fitted out with the material available. We found that we must confine ourselves to furnishing basement foundations, cottages or dwellings, where a good effect could be obtained, the limitations just mentioned to the contrary notwithstanding.

This brought us into competition with Chicago common brick and frame, these materials being used almost exclusively for this class of work. This brings us to the subject of this paper.

—Hollow-Block Building vs. Frame.—

The speculative builder who builds to sell has but one object in view, and that is to build at the lowest possible cost such a building as will favorably impress the prospective buyer long enough to induce him to buy it from the builder. There is no other material in this market from which the builder can obtain such a great variety of effect for an equal expenditure as he can from lumber. He can build in any style of architecture, from the primitive hunter's cabin to the most modern creation of the architect's mind. He can have a radius or angle or bay, a radius or angle tower, or any other embellisments he may choose, and can trim the building in keeping with his design, be it a castleated effect, with buttress walls, or Irish Renaissance, meaning a combination of all styles of architecture, a la Irish stew. He can have his lumber cut so that it will fit properly, and when he has finished, while he has only built a frame structure, we must admit that, when built after a good plan, it looks well. He sells it, and immediately starts in to repeat the operation.

He cares not if after a short time the owner discovers that his home is not what he thought it was; he cares not if the owner discovers that the lumber used was of inferior quality; that one nail is doing the service of two; that paper sheathing was not put in at all; that the paint is crumbling off, and that, should a fire ever reach the studding, it would spread all over the building and destroy it before he could summon assistance in putting it out. The builder cares not a straw if the owner, fortunate enough, perhaps, to escape a destructive fire, finds his home is just as surely being destroyed by the weather, and that he must continually spend money for repairs if he would keep his house in good condition, making the building more costly each year.

However, the owner, who finds that the cold winds of winter are readily conducted through the frame sides and from the basement up through the floors, necessitating the putting of his hand down deep in his pocket for dollars with which to buy fuel if he would keep himself comfortable during the winter months; the owner who finds on entering his basement some frosty winter's morning that the season's supply of vegetables has been destroyed by frost; that the water-supply pipes contain a first-class brand of ice instead of water (inviting plumbers' services, a costly luxury in the city), in short, that "Jack Frost" has taken possession until Old Sol comes back and displaces him during the summer months; the owner who finds that he is living in a house where he must freeze in winter and swelter during the hot days in summer, whose health and happiness is affected in a measure by the kind of a house he lives in, does care for all these things.

The verdict of those for whom we have built hollow block houses is that the objections laid at the door of frame structures are entirely overcome by the use of hollow blocks, and that, although the first cost of a hollow-block house is greater than that of frame, it is cheaper in the end, because "the best is always the cheapest."

The objections urged against a frame building, briefly state, are these:

First. The very nature of frame construction affords ample opportunity for the substitution of inferior grades of lumber where only the best should be used. Green lumber is often used, which warps and twists in the building when it becomes dry.

Second. The framing or roughing in is slapped together in a hurried manner, because, after the siding is put on, no one will know whether it has been done properly or not.

Third. A frame building is a good conductor of heat and cold, and as such transmits to the interior the heat of summer and the cold of winter.

Fourth. The combustible nature of a frame building, ease with which fire spreads, unless "nipped in the bud," increases the cost of insurance.

Fifth. The necessity of repainting and repairing, in order to preserve its life and retain its appearance.

Numerous other objections might be brought up, but those just mentioned will suffice. A hollow-block building will overcome all of these objections, for the following reasons:

First. The hollow blocks which the writer has seen and those which he has used in the construction of buildings have been burned to a degree of hardness making them impervious to moisture and unaffected by weather. It requires no expert to detect a poor block if laid in the wall. Building blocks, when properly laid, will remain so a life time.

Second. Building blocks can be well laid and yet laid rapidly, so that there is little to be gained by unduly rushing or slighting the work. It is impossible in the construction of a hollow-block building to successfully hide either defective material or cheap and poor workmanship. In order to obtain a good appearance it is not only essential to use good blocks, but to have them well and carefully laid. The writer has seen good blocks laid up in such a manner as to disgust a prospective builder and lead him to believe that it was the fault of the blocks that produced the abominable effect presented.

Third. Practical tests have demonstrated that there is no better nonconductor of heat and cold than dead air. The walls of a hollow-block building contain dead air, or noncirculating air, preventing the transmission of heat or cold through the same. The writer has a number of testimonials dwelling upon the fact that basements and houses built of hollow blocks are cool in summer and warm in winter.

Fourth. There is no necessity for a comparison as to the fire-proof qualities of hollow building blocks and frame, as hollow building blocks are indestructible by fire. The rate of insurance is much less for a hollow-block house than it is for frame, being rated the same as a brick or stone dwelling.

Fifth. A hollow building block, impervious to moisture, does not absorb and hold the dirt and dust from the air. Dust does sometimes settle on the face of the blocks, but it is washed off by the first shower that comes along, making a building of this material look as fresh as though it had just received the finishing touches of a tuck-pointer.

The writer can point to buildings of hollow blocks in Chicago which have been up for some years which look as new and clean as they did when first built. There is nothing about a properly-built hollow-block house which needs repair. Unlike a frame building, there is no siding to get loose, etc.

The writer is a firm believer in the virtue and merit of hollow building blocks. He expects to see the day when hollow building blocks will be a standard building material, when doubt and mistrust shall have vanished, when the home builders seeking not the cheapest but the best material for their homes will find it in hollow building blocks; but before that day can come theories which may be readily executed on paper, but which cannot be carried out commercially with clay and machinery, must be abandoned for the practical. Manufacturers of hollow building blocks must come to a realization of the fact that in the construction of residences and other buildings shapes other than a straight block 16½ inches long, a corner and a 45-degree angle are not only necessary but essential.

When manufacturers of hollow blocks catch the spirit of "expansion," now the theme of statesmen, and apply it in the manufacture of hollow blocks, we shall realize in a practical way the perfection and beauty of which we have read and heard so much. Yet, in its imperfect state and necessarily limited application, the writer believes a hollow-block house far ahead of frame from all points of argument, and presents these facts to the gentlemen of the Convention for discussion and verdict in the case entitled "Hollow-Block Building vs. Frame." (Applause.)

W. M. LAUER, Chicago.

President Townsend: This paper is open for discussion.

Mr. Eudaly: Can men making drain tile make hollow block with the same machinery?

Mr. Batley: He can make them all right. There is one feature in this paper I want to call your attention to. He said he had taken the contract for a hotel, and could not go on because he could not get the material. All the parties I know of engaged in the manufacture of hollow block sprung from tilemakers and common brick manufactureres. They are led to believe that by buying a machine they can make hollow block. This is not the kind that goes into the building that is referred to in the paper. You all know as clayworkers that the wages usually paid around the cutting table and machine is anywhere from $1 to $1.50 a day. Go into the Perth Amboy terra cotta works, or Fiske, Homes, of Boston; see the skilled labor employed in making all kinds of fine architectural terra cotta; see the men employed in the drafting room and other branches of the business. Are these men laboring for $1.25 or $1.50 a day? No. They are receiving all the way from $100 to $225 a month. Therefore, is it reasonable or practical that a common brick or tilemaker can make on these machines, with a $1.25 a day labor, what is obtained at the terra cotta works with labor at $225 a month? They are skilled laborers. If you go to build a stairway in a first-class house, you do not get a carpenter or a woodchopper, but you get an experienced stair-builder, and you have got to pay a man good wages for that kind of work. and the weakness in the hollow-block business is that the manufacturers have not given it the attention and study they should have given it. It has been circulated, through the Clay-Worker, in an article written by one of the best posted men in the manufacture of ornamental hollow block to-day, Mr. E. G. Durant, that ornamental hollow blocks can be made and put in buildings as cheap as $5.50 a thousand. I say this is ridiculous. If it can be done, why are the Northewestern terra cotta people, the Perth Amboy people and our friend Gates, of Chicago, and all these people, getting all the way from 80 cents to $5.50 a cubic foot for it, if it can be produced for $5.50 a thousand? These are things the practical clayworker wants to look after. In response to Brother Eudaly, I will say that any augur machine will produce an 8x8 or 10x12 or 4x12 hollow block. He knows it as well as I can tell him. He only asked the question to hear himself talk.

Mr. Eudaly: I asked the question in order to raise the question, or possibly I did ask the question to hear myself talk. I admit all the gentleman has said in regard to this hollow-block business, and will not take any exception to what he has said, but his remarks are a little misleading. I maintain that the man who is manufacturing brick or drain tile with this character of machine can easily make hollow block. I do not think there is any doubt about it. I think the difficulty is, when people begin to talk about hollow block, they instantly think of some tremendous structure in Chicago or New York, or some of those big cities. They think we want to make architectural terra cotta instead of blocks. I believe in foundation work for buldings there is nothing to equal hollow blocks. They are making these hollow block at a moderate cost throughout the country. I have not had any experience, and do not know much about the manufacture of architectural terra cotta, such as used in this building we are in, for instance. There is some very fine terra cotta in this building. Say you are buliding an average dwelling house; a course of terra cotta such as you find in this building would be out of place; it would not look at all well; but you can make hollow building blocks and put them in that dwelling and it will be becoming. A dwelling house of building blocks could be made very cheaply. I never made a hollow block to take the place of brick in the wall, but I believe it can be done.

Mr. Pike: There are two sides from which to look at this hollow-block business, or, as you have termed it, terra cotta. To us ordinary tilemakers, terra cotta is a big word, while that is not the case with hollow block. We have made hollow block, and I would have made more of them, provided I could have got people to buy them, and, as sort of an advertisement, I built an office about 18x30 feet all of hollow block. I made these blocks on an ordinary tile machine. I made them three different sizes, and made as neat a little office of them as you would want to see. It was made seven or eight years ago, and still looks nice. I made the floor of hollow block, and I sent away and got some decorative tile and covered it, so I had a fire-proof building. I tried to interest farmers and those who were using brick to take hold of these hollow block and use them in ordinary houses, but some way I could never do it. I tried to get them to use hollow block wherever they would use brick. I tried to get them to build cisterns and cellars of them. They are cheaper than brick. One way to use them is in building icehouses. We build two walls and fill in with sawdust. Air is as good as sawdust. Build a double wall of hollow block, and do not put any sawdust in at all. I have been in the ice business, and know. You get the same result with hollow block as with a double wall filled with sawdust. You do not have to have an extensive plant to manufacture hollow block. It is a mighty good thing to work when the tile business is dull.

Mr. Eudaly: What is the difference between manufacturing hollow block and manufacturing drain tile?

Mr. Pike: They are just the same, only make them flat instead of round.

Secretary Stoll: Mamer Bros., at Campus, Ill., built a dwelling house of them. I think they used three dies in making them. They made a block 8½x8½x16¼ and another 16½x8¼, and I have forgotten the exact size of the other. I saw the house yesterday as I came through on the train, and I tell you it looked nice. There is a great difference, of course, between terra cotta and hollow block. Hollow block can be made on any augur machine, and be made at a profit. The way they sell these blocks at the factories is about 7 cents apiece, 8¼x8½x16½. Sixty-five blocks of that dimension is equal to a thousand brick. There is not much waste in these blocks. This makes it about equal to brick at $4.50 a thousand.

Mr. Randall: I think there are several gentlemen here who are getting anxious lest they do not get their names on the roll before dinner.

Mr. Pike: I move we adjourn.

This motion was promptly seconded and carried.

SECOND SESSION.

—Tuesday Afternoon, Jan. 17, 1899.—

The Convention was called to order by President Townsend.

Mr. J. C. Madigan: I desire to call the attention of the gentlemen to the fact that street-cars will be at the entrance of the National Hotel at 9 sharp, to-morrow morning, for the purpose of taking members around the city.

President Townsend: There are a number of members here who were not here this morning when the reports from members were given, and we will be glad to hear from them.

J. M. Powell, Orestes, Ind.: I am very well pleased with my business for 1898, and I have better prospects for 1899. Have sold all my brick and tile, and am behind on orders.

H. C. Patton, Flanigan: Our business has been good this last year. We made about 200,000 brick and about the same number of tile, and haven't any left. The prospects are good for another year.

D. O. Loy, Atkinson:

Clayworker am I. I was molded in clay
At a time when brickmaking was anything but play;
That my task has grown hard you will all understand
When I show you the prints of the scars on my hands.
But it is toiling and sweating for bread that we eat
Which makes the pleasures of life seem sweet.
So, with many a hope and many a fear,
I've been digging and molding clay for the year;
So castles I have built and tiles I have laid;
Have sold all the brick and tile I have made—
But 'tis said "confession is good for the soul;"
Brother workers of clay, I am still in the hole. (Laughter.)

George Gillen, Centralia: My business has been a little better in 1898 than in 1897. Prices for brick and tile have been low. I have made several hundred thousand brick, and considerable tile. I have been in the brick and tile business long enough to believe that if the brickmakers and tilemakers are working for glory, they can have the job, and I will take a good rest. I think that the tilemakers have tried to see how cheap they could sell their tile, and I think the brickmakers are in the same boat. As I look over this audience, I see but three or four who were here when we first started this organization. I do not know what has become of them. I have come to the conclusion that it is better to make 100,000 brick at a little profit than to make 1,000,000 and get less money. I think this is something that the brickmakers do not take into consideration. I hope the young men starting in the brick business will avoid this snag. I really feel sorry for the brick and tile men, especially after doing what they have done for this State, the money they have made for the farmers and men using tile. I think I can say that nine-tenths of the tilemakers lost every cent they had, and I hope the brickmakers will not do the same thing.

WM. STARR, Treasurer, Mendota.

Charles Piester, Abington: I am about in the same shape as Mr. Loy—still in the clay hole.

J. W. Hess, Ottawa: The business of the Chicago Terra Cotta Roofing, Siding and Tiling Co. at Ottawa has been very good the past season. We have no reason to complain for the amount of material sold. We have more orders on our books to-day than in any one month during the past year. We are running on clay shingle tile, three-eighths inch. We have increased our capacity to 20,000 roofing tile a day.

D. V. Purington, Chicago: I could say, with Brother Loy, I am still in the hole.

President Townsend: Gentlemen, it gives me pleasure to introduce to you the Hon. John Warner, Mayor of Peoria. (Applause.)

MAYOR WARNER'S WELCOME ADDRESS.

Mayor Warner: Mr. President and Gentlemen—In behalf of the citizens of Peoria, I extend to each and all of you a hearty and cordial greeting, and, as Mayor of this city, I bid you welcome. I hope that your deliberations here will be beneficial to your organization during your stay in the city. You can rest assured that the citizens and city officials and myself will do everything in our power to make your visit one of pleasure. While you are here we want you to visit some of the manufacturing establishments. We have some of the largest in the world. We have the largest sugar house, the largest distilleries, and a great many other manufactories that it would be intersting for you to visit. We think our water works equal to that of any city of its size in the United States. We want you to become better acquainted with our city. You will find the people an hospitable people, who will do everything they can to make it pleasant for you. We have about fifty miles of paved streets and about that many miles of electric railway. Our principal streets are paved with brick. We have some brick paving I put down sixteen years ago when I was first Mayor (this will be my sixteenth year as Mayor), and those brick are as good today as when first put down. We did not know then how to make brick, nor how to make roadways, but that pavement is in very good shape. It may have to be gone over in a few years, but it will last twenty or twenty-five years the way we are putting them down at the present time. We want you to go around and see some of our streets and some of our business interests, and you can rest assured that we are going to treat you right. In short, gentlemen, let me say to you, go where you please and do as you please; the police shall be your guide and protector, and see that no harm comes to you. We hope you will be so pleased with our city that you will visit us some future time. (Applause.)

Secretary Stoll: The next on the programme is the

PRESIDENT'S ADDRESS.

Gentlemen and Friends of the Association:

Again are we assembled to enjoy the society of brother coworkers, to share with each other the experiences of the last twelve months, to gain information that will assist us in the year to come and renew our interests and energies. From various cities, towns and villages have we come to find friends of the same calling. Friends who are ready to join hands and hearts with each other, no matter what their business relations may be elsewhere. Friends who are anxious that the clayworkers of this State may reach higher standards; friends who are anxious that new members may feel this Association is for them, and their interests are our interests.

Happy the thought that in a few hours' time we can assemble from our various homes with so little bodily discomfort and feel that here in Peoria we may enjoy all the privileges of the higher civilization—yes, fortunate are we that the many privileges of this great age are for the asking. The work and ingenuity of centuries has brought about results never equaled and hardly imagined. Time and labor are thrown unstintedly into the determination to further the tastes and demands of man that a higher, broader, clearer plane may be reached and realized.

As man's needs increase so his capabilities, as his capabilities increase so do his influences. That the influences of our enlightened people may be used in the right direction; that the bringing about of more elevating tendencies, broader foundations for future superstructures, higher aspirations and tendencies can, to my mind, only be accomplished by the continued intermingling of the people and the binding together of those whose wants, interests and desires are closely allied. And individually and collectively as our intentions and determinations are, so will be our results.

Therefore, by the continued working together of the clayworkers of this State, by the intermingling of our varied ideas and the sharing of our experiences we shall be a benefit, not only to ourselves, but to our calling, our country and our State. To some of those who have attended these meetings for a number of years this may seem on first thought to be more of a theoretical than a practical fact; yet I will venture the assertion that not one begrudges the time or expense in attending these meetings, and can with but little thought recall facts or incidents that have borne fruits of inestimable value. In a business venture direct results are expected. With associations of this kind such is not the case, but the general trend is for the better, and my hope is that this Association will continue to grow, and that its influences will strengthen and increase.

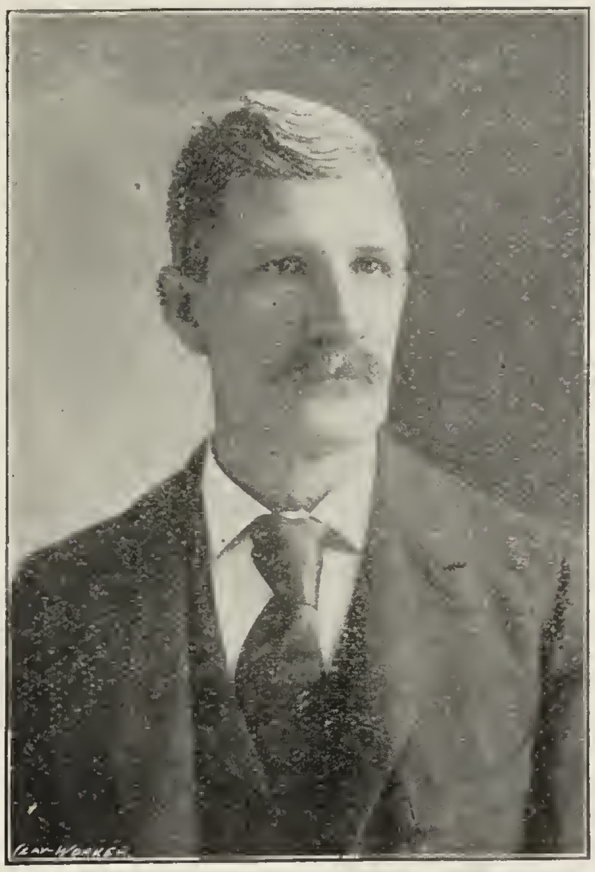
What its influences have been are known only in a general way, yet some of the older members know of direct results, and which, without the Association, could not have been accomplished. At our last meeting steps were taken to make an annual exhibit of the clay industries of the State at our State Fair, and while the results were not as they should be, yet I feel it is a starter, and time will prove it a valuable acquisition to our interests and to our State. My hope is that there we shall annually have an exhibit and practical demonstration of the industry in all its branches, and where the features and advantages can be demonstrated to the public. There we find almost every conceivable enterprise displayed either in its daily business or by some of its products. Situated permanently as it is, backed by the State Legislature and every public-spirited citizen of our State, the statement is safe when we say it is bound to be a leading advertiser, an annual exposition of our state resources and the promoter of our general welfare.

The officers seem ready to assist us, and with some definite plans we can in time place our calling before the people in a proper light and maintain our proper rank among the great industries of this, the nineteenth century—a century the equal of which history does not record.

This is surely a great age, and we are living a higher, more complete life than our fathers. As compared with even one hundred years ago we are as full-grown man is to the prattling boy just learning to read. In the clay industries it is in some respects the same. Perhaps in centuries past work of fine design and skill was produced that equaled the present, but in speed and quantity they were as pygmies. From ocean to ocean we find our factories turning out material, the uses of which the aged clayworker could not imagine. Now the wants of our people are limited only by their power to create. The ingenious mind of man is continually striving to outstrip his neighbor, no matter what his creed or calling. The survival of the fittest is being daily exemplified.

Burned clay is a common, old-styled article of commerce, but is it not a fitting survival that time cannot efface? History proves it is as firm and lasting as the hills, and yet while we gloat over the magnitude of our industries in this line we are only on the theshold of our future greatness. The total value of products in this State for 1897 was over five million dollars. It seems a big thing, and it is compared with many other more popular and modern industries—yet is it big to what it will be at no distant day? Is it big when we see daily on every hand many, many instances where burned clay in some shape will be used to the advantage of man—physically and financially? Is it big when carload after carload of lumber is being shipped to all parts of the country when we all know that a large per cent. of it can and will at no distant day be supplanted by burned clay, the varied forms and manner of using which we can only imagine? No, it is not big, for man is learning the wants and necessities of the age, and is meeting them.

We have our periods of rest and activity in life. Nature demands it. True greatness is never achieved at a single bound. Factories have sprung up as if by magic in the last few years, and probably not one in a hundred is paying a fair per cent. on money invested, and fortunate are they who have dodged the ravenous hand of the receiver. Shall we call this defeat? Shall we give up and say the clay industry is a dead industry? No 'Tis but "a stepping stone of our dead selves to higher things." The experiences and defeats of one will prove the salvation of another. Some one will follow in our footsteps, avoiding the blunders or traps that tripped us, and reach that goal for which we are all striving. Time will prove it. Our calling is an honorable one, and deserves the position accorded the best on earth. Let us then work together, assisting each other to overcome the obstacles that are daily confronting us. Let us renew our allegiance to the cause, never faltering in the determination to outstrip ourselves in the race for that position to which we are entitled. Let us in unity work to overcome all prejudices and accusations and by continued merit gain the praise and reward of public approval—the true criterion of greatness. It will come, and may our achievements and results prove an inheritance to our posterity that ages cannot tarnish. That by our efforts the future clayworker shall be one of the first of the land and that his products will reflect not only credit to us, but to him and his posterity.



J. M. ELDER, Bloomington.

As President of this Association it is my duty to see that each member, especially new ones, is given an opportunity to learn something that will assist him in his vocation. Further, to preside over this meeting that business may be transacted in an expeditious and satisfactory manner. This will require not only my individual efforts, but the assistance of all present. Thanking you in advance for that which I know will be freely given, and the Mayor and citizens of Peoria, who have so kindly offered us hospitality, and are making our visit so pleasant, I will close with the hope and determination on my part to make this a successful meeting. (Applause.)

Secretary Stoll: This brings us to the first regular paper on the programme,

HOW TO TIDE OVER DULL TIMES AND KEEP YOUR MEN.

J. M. Elder.

Mr. President and Gentlemen:

To me has been assigned the task of telling you how to tide over dull times and keep your men. Why our worthy Secretary assigned me this task I can not tell unless he considered me one of the dull members and thought the subject and member would go well together. He certainly did not expect much, and I can assure you he will not be disappointed.

In regard to dull times will say that frequently an ounce of preventive is better than a pound of cure. Many business failures have been attributed to dull times, when it was lack of judgment in the location of plants, the thoroughly testing of the clay before beginning operations, the personal supervision after, and the proper amount of finance to successfully overcome the usual difficulties encountered in the first start. Better start with limited capacity than with limited judgment. Study well your prospects for trade. Do not let yourself be carried away with wild fancies and air castles built by some disinterested parties that are always giving advice when they have nothing at stake. Build within your means. Do not overreach yourself and buy a lot of machinery that you cannot pay for because some newspaper says that A. & B. are going to erect two mammoth structures in the spring and that the city is going to have miles of streets. The mammoth structure may be but one story, and the miles of streets but one.

Look after the details yourself, until you thoroughly understand every part. Be able to take the place of any employe, from the clay bank to the assorting of the finished product. Be able to judge when an employe has done you the proper amount of work in a day, and whether he has done it in a proper manner. Study well the nature of your clay and the proper way to handle it. Overcome the difficulties yourself. Do not leave it entirely to your foreman or some other paid employe. It is not generally expected that they will take the same interest as the man that has the money invested.

Do not be too easily deceived by promises. Many financial ships have been wrecked on the rocks of adversity in a sea of promises. If A. says, "Increase your capacity, buy a larger tile machine, for I am going to take Pike's advice and tile all my high land next year, and will want all the tile you can make," and B. says, "Buy a larger brick machine, you can buy it on time and pay for it out of next year's profits, I am going to build a brick barn on every quarter section I have got, and will need all the brick you can make," do not get excited and buy the largest machine that Stall can sell you, and build a lot of Eudaly kilns, for crops may be a little short, and A. and B. may change their minds, and you will be left to pay for a lot of machinery not wanted, and will attribute your loss to dull times. Do not erect your plant with the view of running but six or seven months in a year, and then shut down and lay your men off and let them get scattered to the four quarters of the globe, and your machinery rust and your kilns go to rack from the action of the frost. Better start with less capacity, and run twelve months in the year, as there is but little difference in the depreciation of a brick plant whether it is idle or in operation. Keep your men together and work them steadily. They will do more and better work, for, as the old saying goes, "A horse never pulls so well in a cold collar." Make good ware. Whatever line you are manufacturing, make it good. Do not have your plant covered with rubbish and call it tile and brick, and attribute your inability to sell it to dull times; but produce a first-class article, put it up in attractive hacks, and ask a price for it that will compensate you for your labor and money invested. Do not get discouraged if customers are a little slow in coming. If you have a lot of good ware it is a safe investment, better than corn in the crib or wheat in the bin, for there is no expensive insurance to carry, and it will not rust or be eaten up by rats. If your plant is of greater capacity than your trade justifies, and you can only run six months in the year, avoid dull times by reducing it one-half, and run twelve months. Keep your best men steadily employed. There is always a good per cent. of men that can be spared, as they are of a class that their places can be filled with but little trouble; but good men, as a rule, are scarce, and, when you have them, keep them together. Better borrow money for manufacturing purposes, and keep your plant in operation. There is but little danger from the sheriff, if you have your machinery paid for and your plant stocked with hacks of good ware. (Applause.)

President Townsend: The subject is open for discussion. I do not believe anyone can say anything about it, unless it be the machine men, and we won't let them.

Mr. Eudaly: I want to say it bristles with suggestions.

Secretary Stoll: The next paper is

DRAIN TILE FOR HIGH OR ROLLING LAND.

By George J. Walter.

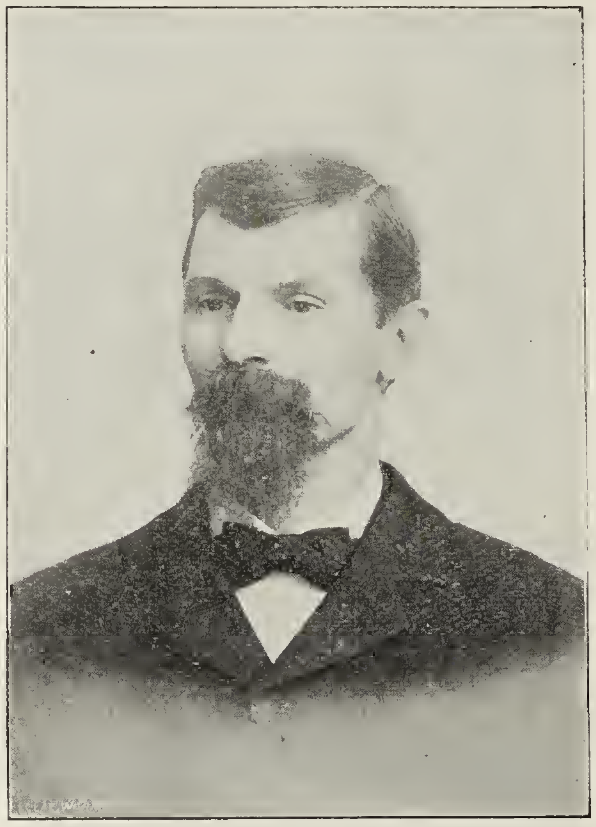
What benefits can the farmer derive from draining high or rolling land? The same question used to be asked in regard to draining any kind of land—low, swampy or high—by such persons or farmers that did not believe in burying their money in the ground by laying tile.

We tilemakers do not have any trouble now to sell tile to drain low and swampy land, for the farmers have seen the benefits derived from drainage. Once in awhile there used to be a farmer that did not believe in drainage. They are few and far between now. I have known such farmers in my own vicinity who thought it was money thrown away to tile or drain low or swampy land. But we as tilemakers notice that they have most all given up their hobby, and are now buying tile to drain their low and swampy land and frog ponds, which have kept the frogs and mosquitoes in existence so long. One seldom hears the beautiful and melodious songs of the frogs and mosquitoes, except it be in some tile or brickmaker's pond, which he has dug to make tile to drain out such places as I named above. What has brought the change in the farmer that did not believe in tiling his land? Was it what the tilemaker said his tile would do, if the tile was properly laid in the ground? No! That did no good, for he would say we tilemakers all talk for our interest, which I admit we do. But in our effort to persuade some one to use tile, it will be a lasting benefit for the farmer that takes the tilemaker's advice and does thorough tiling while tiling his land.

I will tell you what I think brought about this change in the farmer that thought tiling was nonsense. His low and sour land lay just opposite his neighbor's, whose land was no better than his before it was tiled. Both farmers commenced to prepare their land in the spring. The farmer that had his land tiled could get on his land sooner to prepare it than his neighbor who had no tile on his land. But at last he got his land in good shape, but not as soon as his neighbor had. Both farmers planted good seed, and I suppose that the farmer without tile thought he would have just as good a crop as his neighbor, but the weather was unfavorable for the land that had no tile on it; it rained too much, and the crop could not be tended as it ought to be; so, when harvest time came, the farmer with his land well tiled took from one-third to one-half more grain from his land than his neighbor opposite him who had not tiled his land. Now, how often will this have to happen before the farmer that did not believe in tiling or drainage of his land will see that it is to his interest to tile his land or take a back seat?

Now in regard to high and rolling land. What benefits are derived? There may be some who will say that it is useless to tile high and rolling land, because the water will run off of it any way, "but experience is the best teacher," and those that talk against tiling high or rolling land will in the end become convinced that it pays to tile such land. I suppose that you have all noticed that the high land has wet places just as well as the low land; if so, why not tile it?

Some recommend tiling a certain number of rods apart, in parallel lines, over the rolling or high land. I think the best plan is to follow the water courses, which you will find on any kind of land, and in those water courses lay the tile of suitable sizes to carry the water that will fall on the land. You will also find some high land that has a gradual slope to all sides, and no perceptible water courses, but you will notice that part way up the water oozes from the side of those high places, and, following this wet line, I would lay a four-inch tile, and give it such a grade that it would take off the surplus water without coming to the surface as it did before the tile was laid. And if the high land should have low and flat places on top, then it would be well to run a line of tile up into the flat and low places, and then lay branches of smaller size tile into the main which runs to the top of high land. In this way the high and flat land would be thoroughly drained of all surplus water, and, as the soil on high land is often of a very hard clay, I would not lay the tile too deep, for tile laid in such soil will draw better if not laid too deep. The farmers in my vicinity are commencing to tile their high and rolling land, with good results. The ground is livened up by the air passing through the tile laid, and they can commence working all of their land at about the same time. If you ask a farmer now which of his land is the wettest he will tell you the high land, if not tiled, taking for granted that the low land is tiled. Therefore, it will be a benefit to tile high or rolling land. Even if the benefits are not as marked as on low land, it will, nevertheless, pay a handsome income on the investment, and one also has the satisfaction of having a farm that can be farmed with good results in any kind of a season—a farm where failures are very seldom heard of.



George J. Walters, Chatsworth.

I will now come to a close, but I really do not know why our worthy Secretary assigned me this subject to write on, for I no farmer, but a tile and brickmaker.

I think I could do better on a subject or topic pertaining to the manufacture of tile or brick, but I have tried to do the best I can, and hope some one will bring out some more practical thoughts on this very important subject for the benefit of both tilemaker and farmer. (Applause.)

Mr. Pike: It seems to me that this paper of Mr. Walters is one of the papers that states a good many facts, and one that as tilemakers we need. This matter of tiling high lands needs a great deal of missionary work. I think high lands need tiling more than low lands. The high land is more compact, and holds the water more than the low land does. The water goes through it more slowly, while the low land, being of a better nature, the water goes through it more rapidly than the high land. If we can get farmers and owners of high land in Illinois, for instance, to believe that it is worth anywhere from $80 to $100 an acre to them to drain their high land, and that they will get as much benefit from draining their high land as they have from draining their low land, we will accomplish a great good. You tile the high land as suggested, and it leavens it up and areates it. Tile draws air like a chimney. The air passes through the tile in dry weather. It draws the moisture up through the pores of the earth, and the little interstices act like chimneys as the water comes up. The moisture is retained by the soil, and comes in contact with the vegetation, and the result is we have a good corn crop on land in dry seasons, whereas at other places not drained you have a poor crop. I had some experience in that line. I had a piece of land on the base of a hill; it was what we called spouty land; it was unproductive, sort of clammy; I think, perhaps, it covered a quarter of an acre. I laid a line of four-inch tile right up through that place. I did not know whether it would pay, but I did not like the looks of the piece of clammy land right in the middle of the field. There was oats on that ground, and I could stand down at the house and see just where the tile were, for the oats were large and heavy and dark, and they were that way as far as the tile went, and you could easily tell where there was no tile. I got oats enough off the ground the first year to more than pay for the tiling. If we could have object lessons similar to this on high lands it would pay us to pay the man who buys them. The one point is to convince them it would pay to do it. I know that some gentlemen do not believe in tiling high land. If they tried it, and get the results as compared with the high land untiled, they will find it pays them.

Mr. Townley: Brother Pike's remarks are very good. I am often asked in my business what you fellows will do in making tile when the sloughs are tiled up, and I say we will tile the high or rolling land as they do in the old country. They find it of much benefit over there. One thing Brother Pike missed, and that was the preventing of washing in the high land. It is the greatest preventive of that. It aerates the ground and prevents the nutritious soil from washing down, but it goes down instead of washing off. It is the greatest benefit in seasons of drought. It leaves the ground light and friable in the spring, and it will absorb the water and moisture from below.

Mr. Eudaly: If you have a piece of high land, very rolling, that is inclined to wash, and you want to put in ditches of tiling there, would you put the ditch in the place where it is inclined to wash?

A Member: Put it at the side.

Mr. Gillan: The tilemakers seem to have the floor. I have a customer to whom I have sold tile until he has all his low land tiled. One year ago the old gentleman turned the farm over to his son-in-law, and he bought 5,000 four-inch tile to put on his high land, and the result was so good that I sold him 5,000 more and sold the neighbors 20,000, and they have been tiling their high land. They think it pays. I feel so confident that I will guarantee 10 per cent. on his investment to any man who buys tile of me to put in on high or low land.

D. O. Loy: I would quote one stanza

of the first poem I ever recited before this Association:

I have tiled every pond, and I have
tiled every slough;
I have tiled every foot of my high
ground, too.
I don't care for the money it takes,
Since my whole family is cured of the
shakes,
And my children, sir, just do it up
brown,
For they go with the tony young folks
of the town.
Mary, she's visiting folks in New York,
For I'm the wealthiest farmer that lives
in the Fork."

The result of draining high ground. (Applause.)

Mr. Hammerschmidt: In regard to tiling high ground. In reply to Mr. Eudaly's question, I would say we make brick and tile and farm at the same time. We have tiled a piece of rolling ground, fifty feet rise in sixty rods; it washed heavy, and I put in a string of four-inch tile down in the depression where the land washed, and wherever the land washed the worst we dumped a load of broken tile and brickbats and cinders. That is the way we prevented washing. I know this paid me on this year's crop more than the tile cost.

Mr. Eudaly: I put some drain tile on high land—comparatively high land—and the first year after those tile were down I could tell by looking across the corn just where the tile were, and I could go over the field and kick into the ground, and it would be moist down in the ground, and the corn would appear better. I know the drain tile takes the water up as well as out of the ground. I put some of the tile in the high land in the depression where the land washed and I could see the tile afterward, and I did not like it.

Mr. Hammerschmidt: Put straw or cinders and the ground won't wash.

Mr. Eudaly: I thought that was a good thing to do, and I told my man to do that, but he did not do it.

Mr. Townsend: We are not responsible for what you won't do. (Laughter.)

Mr. D. V. Purington: There is a little old ditty that, I remember, appeared years ago; I think it was in one of Franklin's almanacs:

"He who by the plow would thrive
Must himself either hold or drive."

(Laughter and applause.)

Mr. Gillan: I have seen another plan: not to follow the channel, but cross back and forth.

President Townsend: I know of an instance where the land washed quite badly, and we put a ditch as near the center as we could, and then we covered the tile over with dirt and put straw on it, and then got an old hedge and dragged that down there. That was eight or ten years ago, and now we have a fine crop of blue grass there.

Mr. Eudaly: If you want to stop washing effectively there is no better way than to plant blue grass.

Secretary Stoll: I have a letter from Mr. Baldridge saying he finds it is impossible for him to come, but he sends his paper, which I will read.

CLAYWORKING A CENTURY SINCE AND NOW.

By H. M. Baldridge, Illiopolis, Ill.

The making of brick is a very ancient art, the origin of which is lost in the mists of antiquity. Several thousand years ago sun-dried bricks were made in Assyria, Egypt, India and Babylonia, and are preserved to this day in those warm, dry countries. At a later date bricks were burned much after the modern method, and were first used to face the walls of sun-dried bricks.

In both kinds of ancient bricks, straw or grass were mixed with the clay in the process of manufacture, in order to add to its tenacity, and in the Old Testament record is made of the complaints of the Israelites when they were at times obliged by their Egyptian taskmasters to make bricks without straw.

Centuries after this the Romans constructed their celebrated buildings of kiln-dried bricks, and they were so well made as to be in a good state of preservation at the present time. In their most elegant structures the brick walls were faced with slabs of marble, in order to conceal the rough material of which the edifices were composed. One of my townsmen brought with him from Rome pieces of brick taken from the Coliseum, which was built in the first century of the Christian era, and they show no signs of decay or disintegration. He informs me that he saw in Mexico very ancient buildings built of adobes, or sun-dried bricks, that are well preserved, which is, of course, due in a great measure to the mild and frostless climate of that country, in which, by the way, the manufacture of sun-dried bricks is one of the chief industries at the present time.

H. M. Baldridge, Illiopolis.

There are several branches in the manufacturing of clay of which I know so little that I shall say but little about, one of which is terra cotta, except that it is one of the finest, it being used principally as ornaments and for veneering and trimming of fine buildings.

To manufacture terra cotta requires a clay of superior quality, both in the working of the clay and burning. In order to obtain the proper colors, the manufacture of terra cotta represents a considerable outlay of capital and labor.

Pottery, too, is something that I am not familiar with. Potters' clay being very scarce in this State, I think most of the potters have to ship their clay from other States. The manufacturing of pottery also furnishes employment for a large number of men, and the outlay of considerable money.

Sewer Pipe.—This enterprise is another great branch of clayworking. The manufacturing of sewer pipe is nearly always carried on on a large scale. The factories usually are of immense proportions, and are prepared to operate the whole year round.

Drain Tile.—The ordinary field tile is an article which I have been manufacturing for the last eighteen years. This branch of clayworking has been of the greatest importance to the State of Illinois, and particularly to the farmer. It has drained the water from the swamps and lowlands, and with it the chills and fever and a part of the doctor's bill, "but the doctor still has bill enough," and, in consequence, the doctors have it in for the poor tilemakers. In my opinion tilemaking is almost a thing of the past in this State. It is a business that sprung up in a night, so to speak. About twenty years ago the making was just commenced. Factories were built on a small scale in every city and town, and many times in the country, and in some instances a very poor quality of ware was turned out, and in some cases would give way and ruin the drain.

There were hundreds, I might say thousands, of small factories built in the country, and did a very good business for a few years, but when the country was pretty well tiled and the dry seasons of 1894, 1895 and 1896, with the hard times of the same years came on, tilemaking was almost at a standstill, and many factories were torn down, leaving less than half in operation; but too many people found out that tile could be made from most any kind of clay, though ofttimes it would give considerable trouble in drying, for, if dried too fast, they would check. The burning of drain tile was sometimes poorly done, as we (I mean all tilemakers) would not get them hot enough, or quit burning too soon, and consequently the ware would be quite soft and light colored; although I want to say right here, that I think the soft tile are all right if they are not too very soft.

Machines for making tile were a great source of annoyance to tilemakers. There were so many different kinds, and every man had the best machine. The machine man would come around and insure his machine to do better and more work, with less power, and, with his flowery tales about his machines, he would sometimes make the tilemaker think if he had one of his machines he would be almost rich. And the tilemaker think if he had one of his $600 or $700, putting his old machine in at $100, and many times the old machine would be the best.

This being a Brickmakers' Convention I shall endeavor to say more about this branch of clayworking of to-day. There are several different modes of making brick. There are very few brickyards now where brick are molded by hand and laid in the sun to dry, as they were a hundred years ago, where the mud is tempered with a spade, ground in the old-fashioned gum or tempered with a wheel. There are a good many yards where soft-mud brick are made by machine, where they make brick very fast, making from 25,000 to 50,000 per day. These make a very nice brick and make them very cheap, and are as good for building as any ordinary purposes. These machines will make brick from almost any kind of clay that is adapted to brickmaking at all. The soft-mud or sand brick, when burned to a cherry red, make a very nice wall.

Brickmaking in this manner is a very satisfactory way of making brick. They are made by machine, either horse or by steam, then dumped on pallets and put on racks in the shed, where they dry without being exposed to the weather. So the brickmaker does not have to sleep with one and sometimes two eyes open to watch for rain to keep the brick from getting spoiled.

Dry-Press Brick.—To make this class of brick requires a clay adapted to the business, and, so far as I know, there are very few places where this kind of clay is found. My reason for saying this is that I think if clay was plenty that would make dry-press brick there would be more places where they would be made, for it surely does not cost much more to make them, and they are superior in one respect at least, being all perfect in shape and all of one size, and, not being handled when soft, they would be smoother brick. I am reliably informed that dry-press brick are much harder to burn than brick made in other ways.

Just now what we call the stiff-mud brick are getting more attention, I think, than any other brick that we make in this State. Most every man who makes drain tile makes this kind of brick, simply because he can make both on the same machine just by changing dies, and the cut-off clay that will make tile will generally make brick, but in most cases they will check and sometimes break badly.

This kind of brick make a very good building brick. Then there are a great many factories, and some of them very large ones, that make this kind of brick and repress them for paving purposes. For paving brick they must be burned very hard, must be vitrified, and that makes them very hard indeed.

Brickmaking is to-day indeed a great industry, employing thousands of men and millions of capital, and to stop the manufacturing of brick would throw a vast army of men out of employment.

I shall not take up the valuable time of this Convention much longer, but, before I stop, I want to warn the clayworkers of the country of the danger of cutting prices so low that there is no money and not even a living in it. A little less price on brick does not make any more sale. If a man is going to build, and wants brick, he will buy them any way, if he does pay what they are worth. Another thing, when you increase the size of our brick we are not only cutting the price but we are knocking ourselves out of that much trade.

Some people talk of the brick business being just in its infancy in this country. If such is the case, I am in hopes that it will never get out of the cradle as long as I am in the business. (Applause.)

Mr. Gillan: If the writer of the paper will read the first chapter of the Bible he will find that brick were burned thousands of years ago. On the Tower of Babel you will find a solid mass of brick that it is almost impossible to break. When brick lasts that long it goes to show that if brick made from ordinary potter's clay will stand that long, brick made and burned right will do even better.

Secretary Stoll: The next is a paper on

BRICK PAVEMENTS AND PAVING BRICK.

By A. D. Thompson, City Engineer, Peoria, Ill.

The improvement of streets in the United States by paving has developed rapidly within a necessarily short period. The first pavements were constructed of stone, which were durable, easily obtained, laid and repaired. Limestone, sandstone, cobble, trap and granite were used, the particular kind employed being determined by its proximity to the locality and the character of the traffic.

The noise and roughness of these pavements were serious defects, which made them unsuitable for the improvement of residence streets and unsatisfactory on business thoroughfares. In the endeavor to better the conditions and secure a wearing surface that would combine toughness, imperviousness to moisture, smoothness and freedom from noise, experiments have been conducted with a large variety of matearials, nearly all of which have developed defects sufficient to condemn them for general paving purposes.

The materials that have satisfactorily stood the test of time, and which lead all others at present, are brick, asphalt, granite and wood. Pavements of wood are used to a large extent in London, but to a very limited degree in this country. While the least noisy of pavements, it has not given good wearing results, and its use is steadily decreasing. This failure may be due to climatic conditions, the improper selection of the material or faulty construction. Granite is the toughest of paving materials, but the noise and unevenness of such pavements are faults so serious that they are confined to streets having the heaviest traffic in the largest cities. The field of asphalt is somewhat broader, since it is suitable for residence streets of light or medium traffic. It might also give good wearing results on streets with heavy traffic, but its slipperyness in wet, frosty or sleety weather is an undesirable feature for heavy hauling. The lack or knowledge regarding the material and its manipulation by city officials and the poor results obtained in many pavements constructed have overshadowed in a great measure many of the ideal paving qualities of asphalt, while the necessity of a special plant and expert manipulation for construction and repairs has confined it to cities sufficiently large to require a considerable amount of such work.

Brick appears to be better adapted for universal paving purposes than any material that has been laid. It is tough, impervious, smooth, comparatively free from noise, easy to lay and repair, and low in cost, which considerations recommend it on any class of street in a village of five hundred or a city of five million, excepting the heaviest business thoroughfares in the largest cities, where nothing but granite will withstand the wear.

The numerous qualities of brick for paving purposes have been long recognized in other countries, for pavements of this material have been laid in Holland and Japan for more than a century, and for nearly one-half that time in England. In the United States the first brick pavement was constructed at Charleston, W. Va., in 1870. One block only was constructed at this time, which remained in use for eleven years, when it was relaid. In 1873 a second block was laid at Charleston, and an experimental section was constructed the following year at Bloomington, Ill. Experiments were continued by various cities until 1885, but about that time many cities appear to have become satisfied with the merits of brick pavements, and there has since been a steady growth in the amount laid.

The method of construction adopted in the Charleston experiments consisted of a foundation composed of sand, three inches in thickness, and white oak boards one inch in thickness. These boards had been previously dipped in hot tar and were laid lengthwise of the street. This was followed by a sand cushion one and one-half inches in thickness and a layer of brick on edge, laid "herring-bone" style. The interstices were filled with sand.

The general method of construction, however, in the earlier work consisted in laying a course of brick flat on a foundation of sand or gravel. Upon this first course of brick was laid a cushion coat of sand, usually two inches in thickness, and then a course of brick, on edge, with the interstices filled with sand. This construction answered the demands of light traffic, but the foundation was not sufficiently stable to prevent the formation of ruts in city streets subject to considerable traffic, and filled with service trenches, cut immediately prior to laying the pavement. Single courses of large blocks and small blocks, laid directly on the gravel foundation, were also used, but proved inefficient for city work. This two-course form of construction is in use in many places where the traffic is light and the subgrade has not been disturbed, and has given entire satisfaction. A single course of small brick on sand or gravel has been laid to good advantage on country roads. But city streets even with a light traffic generally contain numerous unstable service trenches in the subgrade, and it is essential that the wearing surface be supported by a rigid, unyielding foundation, and six inches of concrete has been generally adopted as filling the requirements. In ordinary cases a comparison will show but a slight difference between the cost of a concrete foundation with one course of brick and one of gravel with two courses of good brick.

A. D. THOMPSON, Peoria.

The material for filling the interstices varies with the locality. Sand, tar, asphalt, patent grout and cement grout have been used. The principal objects of the filler are to prevent the entrance of water and lessen the wear on the bricks. But it must also allow for expansion and settlement of the pavement. These ends have been cheaply and satisfactorily obtained in many places with sand, except on streets where the grade is sufficient to wash the material from its position during a heavy rain. It is posible that the sand filler allows the bricks to chip at the edges more than the solid fillers, but it makes the pavement waterproof, has the advantages of being cheap, easily procured and used, facilitates repairs, deadens the noise, allows for expansion of the bricks and general settlement of the pavement. All other materials for this purpose require great care to use, and cost from ten to fifteen cents per square yard, while many of them are noisy and unsatisfactory.

The traffic conditions or the locality may allow a limited choice in the construction methods, foundation or filler, but the single rule to apply in the selection of the material for the wearing surface is to obtain the best. The bricks must be tough, non-absorptive and strong.

The best method for determining these qualities in some certain and simple manner has proved a serious problem to municipal engineers and manufacturers. Extensive tests have been conducted for several years by able men, with the result that the most serious questions have been solved. A settlement in the near future of the minor details of testing will reduce the selection of paving bricks to a basis as scientific and exact as the determination of the quality of steel, wood or cement.

The testing of paving brick is too broad a subject to thoroughly discuss in this paper, but the writer desires to emphasize his position taken, after several years of testing and construction work, that the three tests of absorption, crossbreaking and abrasion are necessary to determine the fitness of brick for paving purposes. The National Brick Manufacturers' Association, after an elaborate series of tests, recommended the abrasion test alone. While such a test may determine the relative qualities of selected samples, it will not apply satisfactorily on practical work where bricks of all grades must be examined. It is safe to predict that this recommendation will, in a short time, be entirely changed by the Association. There is no single test that can determine all the qualities of any construction material. With brick the absorption test determines its density, the crossbreaking its strength, thoroughness of burning and faults of manufacture and the rattler test its toughness.

It would be presumptuous for me to attempt to present to this Association the principles governing the selection of the material or the details of manufacture necessary to produce the best paving brick. Hard-burned clay building brick were laid in the original experiments, but it was soon apparent that they were not suited to withstand the wear in the streets. These hand-made, sun-dried bricks burned in temporary kilns were too soft, weak and porous, and the manufacturer immediately attempted to better his product, and each fault has been remedied as rapidly as developed. The raw material is selected with great care, the choice being confined to a very narrow field, since the best results are obtained from material containing the proper proportions of certain ingredients, such as silica, alumina, magnesia, etc. The raw material is ground to almost the fineness of flour, screened on fine screens, thoroughly mixed and molded in machines under immense pressure. The green product is then dried rapidly in steam or hot air dryers and burned in down-draft kilns under a steady heat, until the material becomes a vitrified, homogeneous mass of wonderful strength and toughness. All these processes have been reduced to an exast science, requiring great skill and experience, and the least variation from the proper manipulation seriously affects the quality of the product. The raw material must contain a certain amount of moisture, the machine must operate at a certain rate, the temperature of the drying kilns must be accurately gauged, and the bricks must be vitrified sufficiently to be tough, but not brittle. The edges of the bricks are made round instead of square in order to prevent excessive chipping, and many manufacturerers repress the bricks before drying to make them more uniform and regular. Elaborate discussions have also been held between manufacturers as to the merits of side-cut and end-cut bricks, which indicates the thoroughness of their investigations regarding the details of manufacture.

The excellent results obtained from brick paving in the past twelve years, even when constructed of poor materials and with unstable foundations, has led to its general adoption and rapidly increasing use in American cities. In 1897 the writer, as chairman of the committee on street paving for the American Society of Municipal Improvements, collected data from 122 cities in the United States having a population of 10,000 of more regarding the total amount of paving laid and the amounts of the various kinds laid in 1895-6-7, together with the cost of same. This information showed that in 1896 the amount of brick pavements laid in these cities increased 32.5 per cent. over the amount laid in 1895, while the amount of asphalt increased 28.4 per cent. in the same period. On the other hand, the amounts laid in 1896, compared with 1895, showed a decrease in percentage of other pavements as follows: Granite, 48.8; wood, 9.1; sandstone or trap rock, 54.2. These figures prove conclusively that brick and asphalt are rapidly replacing granite, wood, sandstone and cooblestone for paving purposes, and that brick is used more extensively for paving than any other material.

The price of all pavements has decreased materially during the past few years, but the effect of the general adoption of brick upon the prices of other paving materials with which it is a direct competitor, is shown by the fact that in 1897 the average cost of brick paving was 9.3 per cent. less than in 1895, while other pavements during the same period decreased the following percentages in cost: Asphalt, 16.8; granite, 3.0; wood, 9.9, and standstone or trap rock, 20.1. The slight decrease in the cost of granite is explained when it is considered that this material is used only in the largest cities and upon streets where no other material will withstand the wear. It practically has no competitor among other paving materials, although brick promises to become a dangerous rival.

Brick pavements have acquired in the United States a front rank among the older pavements in a relatively short period, and past experience indicates a still wider adoption and more general use in future improvements. Great advancement has been made in the quality of the material and methods of construction, but many defects remain to be remedied. Should improvements in the quality of brick and construction methods continue at the same rate as in the past the brick pavements of the near future will possess, in addition to other qualities, the smoothness of asphalt, the quietness of wood and the toughness of granite. [Loud applause.]

Mr. D. V. Purington: I have, with the rest of you, listened with a great deal of pleasure to the delightful paper just read by Mr. Thompson, and it is a great pleasure to me to meet here a gentleman who, by what he has said, evidences his experience, his ability and his fairness. I want to say to you, gentlemen, that this mild-mannered gentleman who has read this paper is an entirely different person from the man I have been in the habit of meeting as the City Engineer of Peoria. I did not then believe it possible that I could think so much of him as I have this afternoon. I want to say, while we have done a great deal of kicking on the arbitrary decisions of the Engineer, that he should be the entire judge of the specifications and the entire interpreter of them, and there have been times when we felt as though we were being borne down on. At the same time, in no city in the United States do we point with as much pride to the brick pavements as we do in the city of Peoria. And we feel, in talking the matter over in the quiet of our office, that, while Peoria was pretty tough on us, it has brought up the standard of our brick, and that is what we are after. Remembering some of the conversations we have had, I could hardly believe it was the same man. I know of no City Engineer who has taken so able an interest in brick paving as a whole as has Mr. Thompson. We have corresponded a great deal, and it is not all claptrap with him; he is an earnest man, seeking for truth, and if he would only take my advice sometimes we would get along a great deal better. (Laughter.)

Mr. Eudaly: I had not thought to say anything on this paper, but I think it is one of the most comprehensive papers that I have ever heard on the street-paving question, and I have heard a great many. I like this paper very much. I like the courage the gentleman has to attack the great report of the National Brick Manufacturers' Association. I have always wanted to do it, but did not have the nerve—haven't the nerve now. I want to commend the suggestion of the gentleman as to the testing of paving brick. Since he has said this, I may have the nerve, perhaps, to say that he is correct about it. We thought that the abrasion test was the one test to make for paving brick. It always seemed funny to me it was so, nevertheless I did not know but that it was correct. I never believed it. Still, my experience and knowledge of such things would not lead me to say that it was not a correct method. I rather like the thing now of giving more than one test of brick. Another suggestion made by the gentleman, and that is that there are some certain streets that for some reasons granite only is suitable, and therefore granite must be used. That may be so; I do not say that it is not. I do not remember, however, ever seeing one of these streets, yet I may have seen them. Mr. Pike suggests that in Boston there are streets where granite can be used and brick cannot, and he says that this is on account of the grade. I would like to say to Mr. Pike that he knows of no street in Boston of a steeper grade than of streets right here in Peoria.

W. A. Eudaly, Cincinnati.

Mr. Pike: The reason I brought it out was to bring out some other thought. The grade of the Boston streets is so steep that it is paved with cobblestone to prevent the slipping of the horses' feet.

Mr. Eudaly: Now, is that so?

Mr. Pike: I am saying that it is a fact.

Mr. Eudaly: I never saw a cobblestone street in Boston or anywhere else, that was used any length of time, but was exceedingly slippery. I have never seen a street where granite could be used satisfactorily and brick could not. I believe that is so. If I am not correct, I want to know what is meant by a street where granite will serve and brick will not.

Mr. A. D. Thompson: If you will allow me to explain, I will say that the brick, as manufactured at present, are not tough enough to stand the wear. I have put brick on the heaviest traffic streets of this city, and I believe they will stand the wear on any street, except those streets in cities the size of Chicago, New York or Boston, where the traffic is very heavy; there they will not stand the wear. So far as I have been able to learn by observation of the streets in New York, Cincinnati, Philadelphia and Chicago, there are some streets where the traffic is so immense that nothing but granite will stand the wear which they receive. I believe the brick will be manufactured some day as tough as granite, but that day has not yet arrived.

Mr. Eudaly: I live in Cincinnati—that is, I stay there, and live as best I can. In Cincinnati, a number of years ago, a half block in front of the Chamber of Commerce building—not one of our streets is traveled more than Fourth and Vine streets—and while the whole street is granite, except this part of a block in front of the Chamber of Commerce, which is paved with brick. I know that granite has been repaired twice, and the brick has been used as much as the granite and has not been repaired at all. I was discussing the fact with one of our engineers, and called his attention to it. He happened to be the one who had put down those brick. His reply was that this brick pavement, being in front of the Chamber of Commerce, the members of the Chamber of Commerce would drive up there, go up into the chamber, and leave their buggies standing down in front of the building, and that this had thrown the traffic around the pavement, and he did not think the brick had received the traffic. I go up that street, when I am home, I suppose, three or four times every day, and I know that that pavement gets just as much wear as the rest of the street, and it is just as perfect and nice as when it was put down. There has not been one particle of repair, and the granite block has been repaired and turned over. These brick may be superior brick; the granite was said to be the finest granite there was to be had. I believe that brick, if made properly and put down properly, can be used anywhere that granite can be used. I believe, in a great many places where brick have been put down for pavements, the foundations were bad, and the care has not been exercised that has been shown in putting down asphalt and granite. I think brick have had the worst of it. Don't you think so?

Mr. Thompson: No, sir.

Mr. Eudaly: I know in some large cities the engineers, many of them, require foundations for brick to be just as good as those for granite. I think engineers and city officials often say, We won't need to put down as good foundations if we use brick as if we used asphalt or granite. Therefore, it is cheaper to use brick.

Mr. D. V. Purington: There is one little point that my visit to Peoria has brought out more prominently. We brickmakers, interested in the manufacture of paving brick, have become more observant of the wear of brick pavements. If you go out and examine these blocks that have been put down for a number of years you will find a large per cent. of them—somewhere between 30 and 50 per cent.—almost as good as when put down. You go over the new brick pavements and you will notice a difference in brick taken from the same kiln and the same yard. The point I want to make is, the thing we should strive for, as paving-brick makers, is a system or process of annealing which shall not only give additional toughness to the brick we make, but should make that toughness uniform, so that we can guarantee, practically, the wear of brick on the street with as much precision and as much exactness as we would if we were dealers in granite pavement. Whether all the granite from certain quarries will wear alike I do not know. But I do know that on every street where brick pavements have been put down—you will see a very large percentage in this city—with the exception of a little chipping, the brick are just as good as when they were put down. You will find here in Peoria that the kiln marks are not worn from the brick, and you will find the only damage that has been done to these brick is the brittle chipping of the corners. Now, if we can only get some way by which we can give an additional toughness so as to get rid of the chipping, our ware will be perfect, indeed. There is one more thing I want to say, and I think Mr. Thompson will bear me out, and it is that the great detriment to not only brick, but granite, wood, asphalt or any other pavement, in a city where street cars are used, is the flat rail. We should all of us who are interested in any kind of pavements strive, with all the might and power we have, for the permanent introduction of grooved rails, so that the wagons cannot get into the tracks. The streets in Chicago paved with brick, where the flat rail is used, show no special wear except on a line the distance from the track of the length of the wagon axle. Wagons going along will get one wheel in the track and one on the outside. I can show you an asphalt street where the groove along the street-car track is as deep as my arm for half a mile, and, while it is not quite so bad with brick or granite, with wood the result is the same if the flat rail is used. There is no one thing which, I think, will do more to improve our streets than the introduction of grooved rails.

Mr. Eudaly: I do not want to be misunderstood in reference to the paper that has just been read. I did not in any sense offer a word that I have said as a criticism. I think it was an admirable paper. I think it will do a great deal to advance the cause of brick. I want to make a statement along the line of annealing for making tough brick. I have found that the manufacturers of street-paving brick are very largely attempting to prepare their clays and make their brick by the same process in various parts of the country. I believe this is wrong. I believe that many excellent clays can be found that will make excellent street-paving brick if handled in accordance with the kind of clay. Very seldom will you find two kinds of clay that ought to be handled exactly alike to make the best kind of brick. I believe the time is coming when the manufacturer of street-paving brick will be required to prepare his clay a great deal better than he is now preparing it. You will find the very best paving - brick manufacturers — those whose brick stand the highest tests — are those who are very careful in the selection and preparation of their clays. There is another thing that is hurting your paving brick, and that is your manner of burning. You are in too great haste about burning your brick. I will not, perhaps, be misunderstood as in any sense advertising myself when I say that nine-tenths of the people, in writing me about kilns, put this question, "How quick can you burn tile or brick?" They seem to think that all that is wanted is to do it quick. I tell you that haste is damaging more paving brick than any other thing. You will find the brick will not stand these tests—will not stand the structural test, or the abrasion test, or the absorption test, or any of these tests—as well as if burned slowly.

Mr. Pike: What do you mean by the structural test?

Mr. D. V. Purington: The breaking strength or crushing strength.

Mr. Batley: I would like to ask the length of time required for the absorption test.

Mr. Thompson: We use forty-eight hours.

Mr. D. V. Purington: I would like to ask if that is strictly applicable to all classes of paving brick. In other words, will an absorption test or rule be applicable to brick from all parts of the country—that is, equally applicable?

Mr. Thompson: The length of time is equally applicable. It is a hard matter to determine. We find in a number of cases a low margin of an absorption test. Many paving brick will give good results which absorb a considerable amount of water, while those that absorb practically nothing will give poor results. It depends on the material of which the brick are made.

Poet Laureate, D. O. Loy.

Mr. Stare, Mendota: In regard to the chipping of the brick, I will say I have made end-cut and side-cut, and the end-cut will chip and the side-cut will not for me. I have got them in our street, and the side-cut are just as good as when put down, but the end-cut will chip off. I can make a better and stronger brick side-cut than I can end-cut.

Mr. Batley: I believe the report of the National Brick Manufacturers' Association showed that the brick that stood the best test was the end-cut.

Mr. D. V. Purington: That may be true and still Mr. Stare's remarks be true.

Mr. Stare: My end-cut brick will stand a great deal more than the Galesburg end-cut brick when it comes to wear. (Laughter.)

Mr. Purington: If the gentleman will pave one street here in Peoria he may change his mind.

Mr. Eudaly: Some people seem to think that everything that is said about a paving brick applies to a paving brick only, but I tell you there are very few questions raised about paving brick that do not apply equally as well to common building brick. The discoveries that the engineers have made in regard to paving brick apply equally to common building brick.

Mr. L. Solfisburg: I do not know very much about paving brick, but I have found out one thing, and that is that the brick which will take sixteen ounces of water where another brick will take eight ounces, the one that will take sixteen ounces will last longer and be a better brick than the one that takes eight ounces. It will be tougher and stronger.

Mr. Townsley: My clay was in the habit of cracking in drying, and I put in my dry pan some broken brick and crushed them and mixed with my clay. I thought at the time that it would make a very light, porous brick. I found that I obviated the trouble entirely, and made a great deal stronger brick, a little more porous, but stronger and better brick. That is probably the trouble with a great many of the brick to-day. The clay is too fine.

Mr. Solfisburg: I think the gentleman covers the same ground I intended to cover. We make a light brick by mixing sand with it.

Secretary Stoll: The next number on the programme is a paper by Mr. Tompkins, but Mr. Purington, who has a paper to-morrow afternoon, is not well, and has asked to be allowed to read his paper now, so Mr. Tompkins has given way to him.

Mr. Purington: If I could eliminate all the remarks I have made in former conventions on drying brick I could read this paper with a great deal less embarrassment than I do now, but I have endeavored to steer clear of the rocks.

THE DRYER.

By D. V. Purington.

During the past eighteen years I have written several papers on the subject of artificial drying of brick. In the early days of my experience in this branch of brick manufacturing, my enthusiasm sometimes got the better of my judgment, and I apprehend that if I were at this day to review all that I have said and written upon this subject I might feel compelled to modify many of my previous statements. Whether this be true or not, I am certain that my position now would be much less dogmatic than when I was younger. I remember at one of the conventions of the National Association of Brick Manufacturers I stated that in my judgment artificial drying was an absolute necessity to success in brickmaking. I doubt if I would be willing to back that statement up now. Too many men have acquired prominence, and at least moderate wealth as brick manufacturers, who never used anything but sunshine to dry their brick to enable me to truthfully sustain this position. At the same time I belive that in most cases, in plants using more than one machine, it is desirable and economical to operate a part of it with artificial dryers. The possession of a plant with a capacity capable of supplying far more than the demand has during these years of depression done much to change my opinion as to the need of dryers. Since 1893 I could have made more brick during the summer months than I have found it necessary to make, and have been forced to the conclusion that under such circumstances it would have been better if my large investment in dryers had been drawing interest. This, of course, applies only in a general way, and upon the assumption that the results obtained are fairly coequal by natural or artificial drying. No general rule, however, is applicable in regard to drying brick. Quality and kind of clay, geographical location of plant, cost of fuel, value of land, method of manufacture, demand for manufactured material, are among the conditions giving the necessity and advisability of artificial dryers. If the clay is what is termed tender and delicate, and is liable to check or crack under rapid drying, it of course goes without saying that the question of using artificial means tq extract moisture must be answered in the negative. If the location of the manufacturing plant is in the southern portion of the United States, where outdoor brickmaking can be safely pursued for nine or ten months in the year, nothing but lack of room to artificially dry one's product could justify the outlay for artificial drying. There are locations in the United States where brick are made that the cost of fuel would almost make it impossible to warrant the expenditure necessary to prepare for artificial drying. Again, in some localities, the clay land suitable for brickmaking happens to be in or near the business portion of the city, and is so valuable that even at a much greater expense it would be profitable to use artificial means to dry brick, owing to the much less space such drying would require as compared to natural or out-door drying. I am endeavoring in these remarks to reply in this public way to those who, having used the sun and wind for a long time, are still in doubt whether or not this system is the best and most profitable. Many of younger craftesmen jump too readily at conclusions, listen with ears too receptive, and are sometimes too easily convinced by the arguments of the interested advocates of artificial drying and ascertain too late that an ounce of caution would be worth two pounds of cure. All systems of artificially drying brick may be properly comparable to the different methods of manufacturing brick. That which will, under certain conditions, be an unmitigated success, may, under other conditions, be a monumental failure. Unlike all my previous efforts in this direction, I have earnestly tried to divest the expression of my views upon this subject from my personal experience, but am afraid the effort will be a failure. I can scarcely refrain from saying that if the results obtained at the present time in my dryers were no more satisfactory than those obtained eighteen years ago, when I first began to use them, then I shoud openly advocate the use of sun and wind only. I think it safe to assert that no clay that will not allow of drying in twenty-four hours should be experimented with unless fuel is cheap and room scarce; that as an economical proposition the dryer using the direct product of the combustion of fuel will do the required work for less money than one using radiated heat; that some clays can be dried thorougly in twenty-four hours with radiated heat. the product for which would be destroyed by the use of direct heat, and that such clays would only be dried with radiated heat; that all dryers, no matter what system used, should be fire-proof; that if you can produce during the out-door brickmaking season as many brick as you can sell under ordinary circumstances, it is unwise to erect dryers unless you are cramped for room; that, until you have had experience with artificial drying, it is unsafe to attempt to experiment with new methods or systems; that if you erect a dryer on which there is a patent, you should deal only with reliable firms, and be extremely careful that a guarantee was exacted to do all that was claimed for it.

As a general rule, it is safe to have inserted in your contract for dryers, kilns or machinery a guarantee to do the required work to your satisfaction before payment can be exacted. If you have not reputation deserving of such a provision the seller had better let you alone, and, if you are fair and the seller will not trust you to that extent, you had better get along without him.

It is difficult for one with long experience with dryers to write at any length on this subject without allowing his prejudices for or against any particular system to appear. I am interested in no dryers except those in use by the different companies I in part represent. On these there are no patents.

There are at least a dozen different kinds of brick dryers in use, all of which are more or less successful, and none of which are entirely applicable to all kinds of material or all the different processes of manufacture.

Many clays that, dried in the open air, will burn a beautiful red color, whitewash badly if dried artificially, although their quality otherwise may be uninjured.

In conclusion, let me say that in no branch of brickmaking can the caution cure be more advantageously administered than that of artificial drying. The first cost of the dryer, the manner of building it and the practical results may be satisfactory, but the cost be so excessive as to ruin the brickmaker. The dryer may be so built as to dry economically but at the same time spoil the ware in drying. Economy and results in drying may be secured but methods of construction so faulty as to invite destruction by fire. The difficulty in advising new beginners lies in the ignorance of the advisor of the different conditions existing. So far as my experience goes, brickmakers are willing to impart information, and one of the primary objects of these associations is to enable our members to exchange views. We have all made mistakes. Let us in a friendly spirit of unselfishness allow our neighbors to profit by those we have made, and at the same times give them an opportunity to be the gainers by ours.

The writing of this paper has caused me more embarrassment than anything of the sort I have ever undertaken. My pen and voice have been prolific of words bearing in greater or lesser degree upon the subject of drying brick. To go over the same ground again with increased experience and larger charity, without contradicting myself, has been a difficult problem. As the witness on the stand said, after a severe cross-examination which had greatly complicated his testimony, "I don't care what I said before, I am telling the truth now." (Applause.)

President Townsend: This paper is now open for discussion.

D. V. Purington, Chicago.

Mr. Batley: I think our friend Purington has made one remark which is not right. It is a wrong impression to put on the clayworker. I do not believe he really knows now that it is there. It is an assertion that I do not think is just to either the buyer or seller, and that is that the buyer is to have a guarantee that he will be satisfied. There is such a thing, you know, as not being able to satisfy some men at all, and I do not think that is what he means when he says that the man must be satisfied. Now, I am going back to Mr. Purington's first proposition. I do not believe it would pay Brother Purington to make 50,000 brick a day and dry in the open air. I do not believe it would pay him to put up racks and pallets and dry in open air at Galesburg.

Mr. Purington: At Galesburg that question could not come up. It is impossible for us to get room.

Mr. Batley: Well, go to Blue Island, where you have lots of room. If I were going to make brick for you I would contract to furnish my own fuel and make brick for 50 cents per thousand less than by drying in the open air. I believe I know the district you referred to when you spoke of a successful man drying brick in the open air. I will tell you the name of the town and the name of the people after meeting, but you know that market brings at least $2 per thousand more for common brick than any other market in the country, consequently they can afford to pay for open-air drying. Am I correct in that statement?

Mr. Purington: Well, I'm off the stand now. (Laughter.) However, I did not have reference to any special location.

Mr. Batley: I would say, further, that I do not believe that the drying system has yet been brought where it should be. I believe that inside of two years there will be quite a radical change in the drying of brick. It is in the minds of the people who bring these things about, and I believe a dryer will be on the market inside of two years that will dry any clay, I do not care what it may be, that can be made into brick. Clays that dry in twenty-four hours will be dried in less time. I mean a dryer will be perfected that will dry brick, made by any process, successfully, as soon as they should be.

Mr. Purington: I want to say one word, and I am satisfied that I am correct: The system of conducting steam from drying brick over long tunnels, say eighty or one hundred feet of tunnel, and taking the steam all out of that one end, I believe to be erroneous, and the sooner the dryer is evolved from our experience that will allow the steam to go straight up from a car of brick and taken off, without carrying it through these tunnels, the better results we will have.

Mr. Eudaly: We made a dryer in a yard once that I had charge of in which we could dry any kind of brick or clay that I ever saw, perfectly, in much less time than twenty-four hours—dry it almost immediately—but the dryer would only hold about thirty or forty brick. I have made this statement in conventions before. This dryer was an absolutely air-tight box, and we placed the green brick in this box direct from the machine, and we introduced a small amount of steam into these brick. We heated the brick hot throughout, and we had openings in the box so the moisture could leave the box, and these brick would dry and not crack. Whether this can be done on a large scale I do not know. Possibly the time will come when some one will build a dryer which will dry brick, and dry them rapidly, without cracking. It is one thing to talk about what can be done with a small piece of clay in a small way and what can be done with 50,000 or 100,000 a day.

Secretary Stoll: The next on the programme is a general discussion on

CLAY WASHING.

By F. Lehmann.

Among the many and most serious obstacles the manufacturers of clay-ware have to contend with are the foreign substances, mostly in the form of gravel and sand contained in the clay, and very few deposits are entirely free from them.

As the manufactured goods produced are rendered unattractive in appearance, and of inferior quality if these impurities are not removed, many devices have been tried, and are in use now for their removal by the dry process, but it requires either heavy conic rollers, which do the work very imperfectly, as only certain proportions of the stones and gravel are thrown out, or a very complicated and expensive system of separating and screening.

Some manufacturers have tried to solve the problem by running the clay through crushers or dry pans, and grinding the gravel, but this process is very unsatisfactory, as the harmful ingredients, though not quite so perceptible, are still there, and the product must consequently be of an inferior grade.

Therefor it may safely be said that the most economical and perfect method for the removal of impurities from the clay is the slumming process, as it requires less power and does the work thoroughly, provided adequate machinery can be secured.

Besides, by this process the different kinds of clay contained in a deposit are thoroughly mixed and made entirely homogeneous, which cannot be accomplished, in such a perfect manner, by any other method. The goods produced are of a better and more uniform grade, and more attractive in appearance. It would appear that for this reason it is advisable to slum the clay, even if it did not contain gravel.

It has been contended that the slumming process is too expensive, as the clay has to be handled twice before it reaches the machine, but upon closer investigation it will be found that this is really not the case, as the very heavy and expensive machinery used for the dry process can be dispensed with, breakage is reduced, and much loss of time avoided.

In establishments, where the clay has to be transported over long distances, the slumming process will prove more economical than other methods of transportation, as the slumming machine can be placed in the clay hole and the slum led or forced to any place, wherever it is most convenient for the manufacture.

An objection that has been advanced against the slumming process is, that the settling tanks take up a great deal of space, but on examination it will be found that much less room is required than is generally supposed, and as clayworks as a rule have an abundance of ground space, this can hardly be considered, in view of the benefits derived.

An apparatus for this work has been in successful operation at our works in Chicago for three years, and it can be inspected by visitors at any time. It is simple and economical in operation.

It consist of a watertight tank, to which the clay can be conveyed by an elevator or any other method of transportation, where it is brought into contact with water and dissolved by the aid of an agitator.

By this operation the stones, gravel and coarse sand are separated and sink to the bottom of the tank, from where they can be removed without loss of time; either by a laborer or by means of an automatic device which makes it feasible to separate and wash the gravel.

As the slum leaves the machine it passes through a screen, whereby special automatic attachments all roots and fibers are thrown out, and is then led to the settling tanks by means of wooden troughs, in which the finer sand settles. If required, even the very finest grit can be removed and gathered readily.

The machine requires cleaning only twice daily. At our works this is done at noon and after stopping, therefore no time is lost, and the working is virtually continuous. One man takes care of the machine and removes all refuse.

The settling tanks at our works are provided with filters in the bottom and with pipes for draining off the water that gathers on top as the clay settles, and if required arrangements can be made to dry the latter in the tanks by artificial heat. A less expensive way is to run the slum into basins formed by throwing up banks of earth and clay, and let the water drain off through the soil. But this requires more time and ground space.

The machine we employ has a working capacity of 20—25,000 bricks or 50 to 60 tons of clay, it requires 10 to 15 horsepower and one man to run it; this, with the expense of transporting the clay to the machine which varies in different establishments, represents the cost of slumming.

This machine can be built of any size desired and adapted to all conditions, any intelligent laborer can run it, and the knives in the agitator are so constructed that they can be removed easily, and the cost of repairs, which can be made by any blacksmith, are very small.

We are prepared to give all information desired, make practical tests of slumming all kinds of raw material, and furnish burnt samples if required. (Applause.)

Mr. D. V. Purington: I do not think any of you who have not seen this process can have much of a realization of what it does. I do not know of anything connected with clayworking that equals Mr. Lehmann's process of washing clay. If you get interested in this you will find him a very good subject to work.

F. LEHMANN, Chicago.

Mr. Batley: Mr. Lehmann brought this paper before the Convention several years ago, and I think I was probably the first to attack it as not being practical for common clay. In 1897 I spent several months in Europe, and. while there, I saw this process in operation in several different places. In conversation with the superintendents and proprietors I tried to ascertain the cost. That cost I am not prepared to give you now, but it fully convinced me that the cost of slumming clay was cheaper than trying to take the stones out either by dry pan, rollers or disintegrators of any kind. It further convinced me that it was a success because you got rid of the material you wanted to get rid of, which is a very disagreeable element in your clay. At one place a gentleman showed me about twenty-five feet in the soil which contained at least 25 per cent. of limestone pebbles. Below that he had a good deposit of clean clay, but the 25 per cent. on top was limestone. He took the clay altogether and slummed it, and I could give you a brief description of how this was slummed. At the bottom of his tank he had a series of trap doors, and he used to open these trap doors, and I have seen this man run the clay through into the vat and dry it so that it was ready to go direct to the brick machine without going to the pug mill or pan. Therefore, seeing that I attacked Mr. Lehmann's paper some three or four years ago, it is only fair for me to say now that I think it is a very good thing in the right place.

Mr. Eudaly: Where is that right place?

Mr. Batley: You ought to know without my answering that question. There are a great many clays in this country which contain a great deal of limestone, and you know that a great per cent. of limestone is injurious to the manufacture of brick. I say that there is no machine manufactured in the United States or Europe that will positively remove that limestone. They say to the clayworkers, We will put your clay through a screen so as to reduce that limestone to a powder, and it will not be apparent on the brick. I say it will, not as an explosive, but it will show as a whitewash. There is a proper place, Brother Eudaly —in a clay that contains limestone or stone of any kind. I have no ax to grind as to Mr. Lehmann's principle, but I objected to it several years ago, and I want to say now that I think it is a good thing.

Mr. Eudaly: I do not question a thing that has been said in this paper. I have slummed a great deal with clay, and I know how it is done. I asked the question, Where can it be done? in order to bring out another point. I meant, How many of us can use it in a practical way? I believe an ordinary brickmaker had better build his plant and use clay that is free from limestone rather than build his plant where there are limestones and wash his clay.

Mr. Hammerschmidt: I want to say that I have seen Mr. Lehmann's plant in operation, and I have been experimenting with it ever since. I have a slummer and have slummed fifty yards of clay a day, but I am trying to invent something that will dry it a little faster.

Mr. Batley: Ten years ago I don't suppose there was a barrel of Portland cement made in the United States. Now we have more than one concern producing from 1,000 to 20,000 barrels of cement a day. In less than twenty-four hours after the grinding of the rock, the marl and the clay which go to make that Portland cement it is in the barrels ready to be shipped. Portland cement is first made the consistency of molasses in summer time. This is forced into pumps, from pumps into tanks, and goes from tanks into radiators, and when it comes from these radiators it is ready to go to the proper scales and be placed in barrels. Now, if you can dry Portland cement, which is made of nearly 60 to 85 per cent. of carbonate of lime, with its proper quantities of other materials, in twenty-four hours, you can surely take slummed clay and dry it in twenty-four hours. If any of you don't know how to do it, and will come to me after this meeting is over, I will tell you how it is done and explain it to you.

Mr. Eudaly: Would it be practical to run this clay through a filter press?

Mr. Batley: Mr. Eudaly knows very well that filter presses are used in every pottery in the United States. These presses are used in the manufacture of cement, of which 75 per cent. is water and 25 per cent. cement, and the cement is fully taken care of. Now, the filter presses are not only used to take care of clay, but the Standard Oil Company uses these presses to take care of oil.

Mr. Plumb: I want to ask whether it is practical to use this slumming process where the clay and water are quite a distance from the plant?

Mr. Purington: Yes, sir.

Mr. Plumb: And can this water, after it is drained off, be used over again?

Mr. Purington: Yes, sir.

Mr. Plumb: A process that can be used in the manufacture of Portland cement, that is being sold at $1.50 to $2 per barrel, may not be practical for a clayworker, where we sell two or three tons of our products for $6.

Mr. Hammerschmidt: I would like to have Mr. Lehmann himself explain this matter to us.

Mr. Lehmann: This water is drawn with a lever pipe that goes down with the settling of the clay and keeps the water very little above the clay. As soon as the clay goes down the water comes on top, and the pipe comes with it. For quicker drying where the place is very small, so you cannot dry in open air, we have an artificial dryer, and in this dryer we use direct heat or heat from the kilns. I take this dry air and run it above the clay inside the settling tank, and I use a suction fan, so that the hot air rises on top the tanks. There is a different arrangement by which we can put porous brick in the bottom of the tank, and we connect them with the hot-air flue, and we take the moisture out both from the bottom and the top, and the top is connected with the suction fan, and so we keep the air moving

Upon motion the Convention adjourned to meet Wednesday afternoon at 2 o'clock.

THIRD SESSION.

Wednesday Afternoon, Jan. 18.

President Townsend: We are just one hour late, but I don't believe any one regrets it, if I can judge from indications. I think you are all as pleased to see the exhibition given by the fire department as I myself. I wish I could stay a week. I regret that I have got to go home. But we must continue with the programme.

Secretary Stoll: The first number this afternoon is

THE FUTURE OF CLAY PRODUCTS.

By G. A. Tompkins, Avon, Ill.

To deal with this subject in a satisfactory manner much time could be interestingly occupied. Some of the first thoughts are, where will it lead, and how much will it take with it? With one sweep of the mind we take in the whole gamut of ages past, and look with questioning eyes into the dim uncertain future. We see the crude utensils and straw-bound bricks, the rudely decorated jars and jugs, the fire-burned bricks and wheel-turned pottery ware, the glazed ware of China, and the highly finished enameled ware of to-day, with its complements of fancy brick, artistic pottery, terra cotta, architectural designs and commercial products. Then with longing eyes we ask what will be the future?

To properly judge or form an estimable opinion of any subject one must needs have some understanding of the past and present. To build a house one either consults an architect who makes that business a study and is supposed to know the best, cheapest and quickest way to meet the conditions, or examine the buildings or homes of others with whom the builder is acquainted. These are carefully considered, that some of the many plans and specifications may be adopted to suit his present needs. The same is true in business relations. A prospective investor makes himself acquainted with the past conditions of his prospective purchase, studies the present, and then with all other conditions considered bases his estimate of the future.

While probably no national or even personal investments will be made on the basis of this article, the writer wishes to state that he will not be responsible for any undertakings or decisions that might be started by reason of the statements here made.

The future no one knows, and what it will bring forth is only a matter of conjecture. By looking over the past and comparing it with the present we may form an opinion and perhaps gain a few facts that will be of value.

The records of ancient history are proven many times by the hands of the early clayworkers. The powers of time have failed to destroy those monuments to our industry which were formed by the untutored hands of childish simplicity. No other industry can point to such a record. Surely "man may come and man may go," but the clayman goes on forever.

Footprints in the mud, dried by the sun, may have given the first idea of using that means of making articles for the use of man. Surely it required but little reasoning to see that if those prints remained in their position through some time, and that if such marks were lasting others could be made. Perhaps in childish play odd shapes were made and carelessly left to be fixed by the burning sun. These awakened some passerby to thought, that such things could be used to man's advantage. How it started and where history fails to record, and is surely beyond the reach of this article.

From this small beginning have grown ideas and facts from which we shall gain our ideas of the future. Peculiar and lasting articles were formed that equal any of the present day. They mixed clay with water and fashioned it with their hands. We are doing the same. They arranged some way to subject those articles to a high degree of heat that fixed them in their position to withstand the effects of time. So do we.

They placed peculiar marks and figures on their ware to suit their tastes and inclination. This to-day designates the maker and his reputation. They had their secrets in regard to coloring, mixing and handling. To-day only a few know how to produce the beautiful tints and shades found on some of our fancy wares. It is a fact that a greater part of the productions of clay goods of our age that are hand-made were made by the ancients. Is it possible we have made no advancement? Is it possible that the clay industry has not advanced with other studies of civilization? In the metals, with possibly one or two exceptions, we have far outstripped them; in fact many of our every-day articles were unknown to them. Our appliances for meeting the wants of man in everything are far beyond their dreams. To-day we do what would have taken them years to accomplish. How about the claywork? In only one way have marked changes been made, and that is by putting clay under pressure. By this we gain time and quality, and to me it is the basis of our future improvements.

G. A. Tompkins, Avon.

Man's tastes increase with higher civilization, and to meet them we must pass the landmarks of time swiftly or other enterprises will leave us behind.

The old hand-made articles must be supplanted by rapid machine work that combines utility and beauty. We have the best foundation to build on. Its stability and record is unquestioned. But to maintain our position with other contemporaneous improvements we must of necessity hasten. We will do it, and the putting of clay under pressure and thus forcing it to conform to the ideas of the maker in a rapid and sure manner will be the means to the end.

We know that clay can be put in a condition that will fill many of the places now filled by glass, paper and the metals. We know the first cost and supply are in our favor. We know the uses of clay have increased in the last few years, in fact some of the greatest strides in advancement have been made in the last two or three decades.

The combination of steel and clay products for building purposes is a happy combination, and will lead to great achievements. Our tall, complete, secure and lasting office buildings of our cities are among the wonders of the world. The security from fire as illustrated by the late fire in New York is a sure guaranty of our future in this line of work. Not only in large cities, but everywhere. Steel will be the backbone, and clay products will furnish the completed figure. From every crossroad of the great Western prairies comes faint but certain wails of anguish crying for deliverance from the slimy, sticky mud that sticketh as a brother, and which clogs the wheels of commerce and advancement. Slowly but surely this cry is being answered, and as our trade and population increases our paving brethren will reap the reward.

Another thought. We are periodically notified that some genius has discovered a way to make glass ductile. So far it is beyond our reach successfully. Does it require much stretch of the imagination to see our clay mixed with an ingredient that will produce that effect? What a stride that would be. Not an industry, not a profession, not an individual but would share with us in the leading industry of the world. Chemistry is comparatively a new laborer in our field, and we know not where she will lead us or how soon we may find the key to the secrets of mother earth and unlock the mysteries of her great storehouse.

Every factor points with sure and steady aim to the handwriting on the wall which says in letters plain and clear: The United States will be crowned queen of all nations in this as all other enterprises, and Illinois will be the brightest jewel in that crown. [Applause.]

Mr. Plumb: I want to add one suggestion to almost the closing sentence of the paper: There is both fame and fortune awaiting the discovery of any method of making glass malleable by the use of clay or any product.

Secretary Stoll: When I was arranging for the programme I wanted a paper on soft-mud brick by some one in Peoria, but, not hearing definitely from them, I had the programmes printed, leaving this topic off. A day or two afterwards I received word that Mr. Wookey would prepare the paper which he will now read for us.

SOFT MUD BRICK.

By B. Wookey, Peoria.

Mr. Chairman and Gentlemen of the Convention:

It gives me great pleasure to-day to be with you and to give you a cordial welcome as the clayworkers of Illinois to our beautiful city of Peoria, for we consider that Peoria is one of the most beautiful cities in the State of Illinois, and I am glad to say that you are the first convention that have the honor of assembling in this, our new city hall. We think it is one of the finest and most complete in any city in Illinois outside of Chicago. I said Peoria was a beautiful city, and it is also a progressive city. The business part of Peoria is situated in the valley, and we are surrounded with hills from the east, west, north and south, with a beautiful lake running in front of the city, and in the summer time it is dotted with pleasure and steam boats which are a great source of enjoyment to the citizens of Peoria. Not only a fine city hall, but we also have a beautiful building for free library, and we have thirteen or fourteen very fine school houses, with a splendid corps of teachers and principals, which have the care and education of the children. We have fifteen or sixteen splendid churches in the city, and on the Sabbath morning while the church bells are ringing the parents and children are filling the streets on their way to church, where religion and morality will be taught to them from the word of God. We have miles of improved streets. I think sir, about nineteen miles of paving, and seven or eight miles of asphalt. We also have electric cars running in all parts of the city, and for miles into the suburbs, and there are about fourteen railroads centering in Peoria. Well, sir, this is not all that we have. Some of the finest distilleries are situated here, and I think I can say in any part of the world, and we have a number of them. They manufacture millions of gallons every year, and we pay more revenue to the general government than any city in the United States. Their capacity for using corn is great. There is about 50,000 bushels of grain, with the sugar house included, manufactured into whisky and glucose every day. Our revenue to the government last year was somewhere near $23,000,000. Now, sir, you must not think that the citizens of Peoria drink all the whisky that is manufactured here. I know that abroad, east, west and nearly every other direction, people are apt to laugh when you speak of Peoria. They consider it a whisky town, as a gentleman said to me the other day in conversation. "Oh yes," he said, "I heard of you back in Vermont." But, sir, I have lived in Peoria ever since she was a baby, some forty-two years, and you will see fewer drunken men than you will find in most any other temperance town in the United States, and the two or three days; gentlemen, that you are here I think I can guarantee that you wont' see a single drunken man on the streets of Peoria. Our good Mayor and his administration always keeps our city orderly and in good shape. Our water works and fire department are out of sight. We have fires start here, it is true, but the fire department is on hand generally so quick that there are very few buildings burned to the ground. Now, gentlemen, you see that we provide for the drinking part, and we also provide for the pleasure part of the citizens, for our park system is very fine. Glen Oak Park is a perfect gem. It is not so large as some parks in other cities. It is ninety-seven acres, and has all the natural scenery, beautiful trees, and the running water from artesian wells. If you were only here in the month of June and could see it bud out in all its green beauty you would be delighted. Bradley Park is one hundred and forty acres. It is now under improvement. They have spent $30,000 on it, and when we have put $50,000 more it will be a diamond. In the lower part of Peoria we have a park of ten acres that is a perfect little beauty. That park is about completed, with a nice pavilion, a beautiful lake, and lighted up with electricity at night. So you see we are up to date in all modern improvements.

Now, gentlemen, you being clayworkers, we are blessed in Peoria and around Peoria with plenty of clay and good material for manufacturing brick. When I first came to Peoria, in 1855, they were then making brick, and I think there were about eight or ten yeards running. It did not take such a very large capital to start a yard then. We would get a sweep and a spindle and bore four two-inch holes in the spindle; then we would save down some hickory sticks about three feet long and drive them in the holes in the spindle, put four posts in the ground, one at each corner, get some pine boards three and a half feet long and one foot wide and ten cents' worth of nails and nail it all together, make a small table in front, large enough, say, to hold two molds, and then cut a hole in the front of the machine so the mud could come out on the table. We then got three molds, six bricks in a mold, so we had a brick machine complete. A hole was then dug in the ground at the back of the machine and filled with clay enough to make from seven to eight thousand brick. This was then soaked and let stand for two days and two nights. We would then get a horse for about $30 and an old set of harness and one singletree and a good long rope to keep the horse in the track. We would start up with five men, one molder, one temperer, two obearers and one pit filler. Five men would make every day from seven to eight thousand brick, generally getting through molding about 2 o'clock. The molder would then set the brick in the kiln and the temperer and two off-bearers would wheel to him, and they would wheel and set every day one day's molding. Each yard would have three machines and three pits. The clay digger would fill one pit a day and water it ready for molding. Our klins were usually about ten arches, and were inclosed with eight-inch casing, leaving, of course, a hole in front of each arch about one foot square to fire in. After the casing was up we would daub it thoroughly and set fire. We burned all wood in those days, and we generally burned in from five to six days. When we started to burn, we shoved the wood in without stopping, and burned quick and fast. They didn't mind a few soft brick then, and sometimes we had them tolerably hard. We pulled them out in large clinkers, sometimes as large as a wheelbarrow, but they didn't mind clinkers. They took the pick and picked them all apart. There was always plenty of good, hard brick to face up with, therefore they all went to market—soft, face and hard—and sold at $6 a thousand and paving brick for sidewalks at $8 a thousand. Since that early day brickmaking has improved in Peoria a good deal. Those bricks were what we called slop brick or water brick. The molds were made of pine wood, with a tight slide on the bottom, and we would dip the mold in a box of water, take it out of water, put on the table, and the molder would put in the mud as quick as he could. We used no wire, but cut them off with the hand. The offbearer would then take them and run down a yard about seventy feet long, turn the mold over, put it down on the yard, pull the slide off, lift up the mold, and you had six brick on the yard. We used no trucks in those days, but carried off every mold singly. Now there is only one yard in Peoria that makes water brick, and they use a machine instead of the hand molding, and they make a very good brick. They dig their clay down about twelve feet, and make with the machine from 10,000 to 12,000 a day, working by horse-power. We have a large plant run by Mr. Spurkes, the output of which, when they are running full blast, is 75,000 per day of paving brick. They have a shale clay bank about forty feet deep. They have twelve down-draft kilns and large crushers, and the machinery is all of the latest improved. Then Henry Dearing has a plant with modern machinery that runs out 25,000 building brick. His clay bank is about twelve feet. Mr. Randel runs a Martin machine, and makes about 12,000 or 15,000 a day. He digs his clay about twelve feet, and makes a very fine building brick, and burns in an up-draft kiln with all coal. John Madigan has a very complete brick plant, Martin machine, sand molder, runs by steam power; output, 25,000 a day. William Fox runs a Quaker machine, steam power, 25,000 a day. A. Giles, James Flanigan, Joseph Dalton, Mark Miller and Joseph Pierce each runs a yard with horse power machinery, and their output is 12,000 a day, all molded in sand. Henry Kane has a fine plant for making building brick, steam power; output, 25,000 a day. Six or seven of these gentlemen dig their clay from the surface about 2½ feet deep, which makes a very nice red brick for building purposes, and brick that is good and substantial when burnt reasonably hard. The brick from this clay, what we call our paving brick, is used principally in sidewalks, and our hard brick is not affected by any weather, no matter how hot or cold. You can take this brick and soak it in water for a week or month, if you please, and it doesn't make any difference whether the temperature is 10 or 20 below zero, you can leave it out until spring and I'll guarantee they will be as good and perfect as they were when taken out of the kiln. Most of the building brick that is made and burnt here is burnt in outside kilns. We use the same kind of wall as we did in the early days, scoved or cased, with the doors set in the casing three bricks from the bottom, which leaves a space for taking out clinkers of about eight inches, because we burn now with wood and coal. Instead of burning in five days we now take from eight to ten days. We watersmoke with wood. When the water smoke is off, and the fire gets close to the top, we commence to burn coal in the mouth of the kiln, and we run our runners of wood into the center, three sticks of four feet long, from each side of the kiln, which meets in the center and runs back. We use some wood at the mouth, with plenty of coal, and I must say that all the burns that are made in Peoria now are very good. The arches stand up smooth and straight after they are burnt, and I think, sir, that in every kiln that is now burnt we get about 90 per cent. of good, hard brick, and Peoria men that make building brick have all tried grate bars in their burning, but we have all thrown them out. We can do much better without them. In the clamps and down-draft kilns of course we use them, but not in the common kilns.

WM. HAMMERSCHMIDT, Lombard.

Our fuel in Peoria is very reasonable. Good hard wood, delivered on the yard, is from $2.75 to $3. We have plenty of coal around here—I think I am safe to say almost inexhaustible. We can get it delivered to our kilns for six cents per bushel.

Now, gentleman, this gives you an idea of the extent of claywork in Peoria. (Applause.)

President Townsend: We ought to be very thankful to the gentleman for the remarks he has made. The next is a paper on

THE FUTURE OF BRICK PAVEMENTS IN CHICAGO.

By Frank W. Moulton.

In speaking of the future of brick pavements in Chicago, I lay no claim to being either a prophet or the son of a prophet. On some subjects it may be impossible to foretell what a day may bring forth, but even the most superficial observer of conditions in Chicago is qualified to speak with a certain air of authority on the future of paving in general and of brick paving in particular.

The past is the herald of the future. Cities and nations and the revolving planets are like man. They are born, they live, they die. Although Chicago resembles other cities in many ways, she yet differs from them on account of her more rapid and phenominal growth. Like some children, she has been continually outgrowing her clothes. Her nakedness has been too long covered with diapers of cedar block. She is now a big girl, and should have a new and handsome brick-colored dress. It would add materially to her comeliness.

Before dealing with the future—and this future is in no manner akin to the futures dealt in by the members of the organization at the foot of La Salle street—I wish to treat briefly of the past and the present.

Chicago was built in a marsh. No one knows why. Possibly the charm and seductiveness of that placid stream, the Chicago river, had something to do with it. In an endeavor to rise high enough to permit sewage to run down into the lake instead of up into the lake, the grade was raised, and it was raised at more or less irregular intervals through a long period of years. In fact, the grade was raised and the wood pavement needed renewing at about the same time, from which it may be inferred that the grade was raised pretty frequently. Under the circumstances, therefore, a temporary pavement was possibly the ideal pavement.

But the grade-raising days have gone by; the city has been leveled up, and yet there are to-day 766 miles of Chicago's streets paved with cedar blocks. Twenty per cent., or 153 miles, is in fair or good condition. The remaining 80 per cent., or 613 miles, should be replaced in the near future; in fact, much of it should have been replaced years ago with a high-grade and permanent pavement. When I say that this wood pavement is for many miles, and on important streets, practically impassible for vehicles of whatever description, I am stating the exact truth, although I grant it must sound like a fable to those who have not seen it with their own eyes.

Let me particularize: "Commissioner of Public Works McGann and Superintendent Crosette, of the Street and Alley-Cleaning Bureau, yesterday" (I quote from a Chicago daily of Nov. 16 last) "investigated the streets and alleys of the Eighth, Ninth, Tenth, Eleventh and Twelfth wards. They found a dozen are more streets that were absolutely impassable."

During a heavy rain storm some weeks ago over 100,000 yards of cedar-block pavement floated, and, like Jonathan Swift's floating island of Laputa, could be moved about from place to place.

Ordinances have been introduced asking the City Council to authorize ferries in certain streets, and, although the ordinances were introduced chiefly for the purpose of directing the attention of the public to the miserable condition of affairs, yet I found, upon personal investigation, that the streets referred to could not be conveniently crossed except by means of a ferry.

One alderman, speaking of a street in his ward, said, "Neither artist's brush nor writer's pencil can picture the waste of water and mud and floating pavement which greets the eyes of those so unfortunate as to live in that vicinity."

Commissioner McGann said recently, "Chicago's streets are enough to bring the blush of shame to the cheek of her humblest citizen."

The wood pavement on Wabash avenue, from Twelfth to Twenty-second street, a distance of a mile, has deteriorated so rapidly during the past two or three months that it became absolutely necessary to repear it. In this mile there probably forty holes, each from ten to twenty feet in diameter. Tons of ciders were dumped into the holes, and thus the pavement was repaired.

Miles of West Side wood-paved streets have been repaired by filling the holes with plaster, tin cans and refuse of every kind and description.

These are the existing conditions. The question naturally arises, "Who are to blame for them?" The people themselves are to blame. Dishonest city officials and dishonest contractors joined hands and robbed the people, robbed them repeatedly, and the people allowed it. In fact the people got used to it. They were held up, robbed, cheated and bamboozled so frequently that they would have been surprised at any other treatment. Through such criminal combinations were most of the wood pavements laid.

But all things change, and now we have an honest mayor, an honest commissioner of public works, and some honest contractors, and the people are waking up.

Ever since the agitation of several years ago in favor of the boulevarding of East Jackson street there has been a regular and healthy growth of public sentiment in favor of better pavements. But there is yet a large element requiring education on that subject.

Commissioner McGann has said, "We have been able to do very little to remedy the condition of the streets. We have fought and fought, and the little we have accomplished has been after battling with resistance on every hand."

Under the new paving law, the Board of Local Improvments has the power to originate improvements. This power it has not exercised, evidently through fear of creating an increased feeling of antagonism, chiefly among those who seem to be totally unable to realize they are themselves directly benefited by having the street on which they own property transformed from a veritable Slough of Despond into a permanently-paved, first-class thoroughfare. The circulation of a paving petition on any street at once starts a war between the live men and the fossils—between those who favor improvement and those who are content with things as they are.

What is chiefly needed is the education of the public on the subject of street paving. The press should thoroughly discuss the merits and the demerits of the various pavements, the kind of foundation to be laid, the principal features of the paving law, etc., all for the general good. The whole subject is one of growing importance, and the newspapers have repeatedly criticised the existing wornout pavements, but at the same time it must be acknowledged that several of the Chicago dailies have been somewhat fearful that by mentioning brick or asphalt in their columns they would thereby be furnishing contractors with free advertising. They should, with a desire to benefit the city, speak without fear or favor of all pavements, and aid as only newspapers can in bringing about the permanent and proper repairing of hundreds of miles of the streets which are now an absolute disgrace to the city. As the old pavements have for years been deteriorating and going to pieces much more rapidly than the new pavements have been laid, it is evident that the day must come, and come soon, when the conditions will be so intolerable that a virtual revolution in public sentiment will result. The people will shake off their lethargy, the paving era will be at hand, and Chicago will take her proper place among the well-paved and clean great cities of the earth.

Let us then bear in mind that of the 766 miles of cedar-block pavement, 613 is in need of repairing. Of the 357 miles of macadam but 50 per cent. is in good condition. The 26 miles of granite is rough, noisy, worn, slippery and difficult to clean, and must ultimately be replaced with a pavement better suited to traffic conditions, and there are, in addition, 1,440 miles of unimproved streets, many of which should be paved in the immediate future. Chicago also contains 1,372 miles of alleys, of which 1,258 miles are unimproved, but 114 miles have been paved.

The total mileage of streets and alleys paved in 1898 was 36 1-5.

Estimates have been prepared for over 100 miles of pavement to be laid during the present year, a great portion of which is of the better class.

It is gratifying to note that brick as a paving material is rapidly increasing in popularity in Chicago, the result of improved methods of brickmaking and the conscientious manner in which the pavements have been laid.

The brick pavement of to-day probably more nearly than any other fulfils the conditions required in a perfect pavement:

F. W. MOULTON, Chicago.

1. The repressed vitrified paving brick is impervious to moisture.
2. It affords an excellent foothold for horses.
3. It is smooth.
4. It is reasonable in price.

The repressed paving brick is as dense as granite, and it will withstand a greater crushing test, as recent experiments have demonstrated.

Being nonporous, it is sanitary, a most important feature.

Paradoxical as it may seem, it is not only so smooth that it offers little resistance to traction, but during its entire life it affords an excellent foothold for horses, as it never wears slippery.

Unlike many other pavements, a brick pavement never decays.

A pavement of high-class repressed vitrified brick, with the interstices filled even with the surface with a cement or grout filler, laid on an eight-inch cement concrete foundation, will sustain the heaviest traffic in Chicago, is practically indestructible, and will outlast any other known pavement.

The alleys of Chicago, and more particularly those in the business portion of the city, are greatly in need of improvement. They should be repaved and kept clean. They should be called courts or arcades, and electric lights should be installed, so that they might at all times be as well illuminated as the streets. Shopkeepers would flock to them, thus adding to the revenue of the abutting property; the congestion of the streets would be relieved, and the general appearance of the downtown section of the city would be materially enhanced.

A portion of Calhoun Place, one of the principal business alleys of the city was recently paved with brick. The pavement which it replaced had fallen into decay under the influence, chiefly, of uric acid, an acid which, it is generally known, has no effect upon brick. In fact, this is so well understood that in Minneapolis, Washington, D. C., and other cities it has been found necessary to lay brick gutters in the asphalt-paved streets. The brick pavement in Calhoun Place was laid on a heavy cement concrete foundation, and it is, without doubt, the most durable and in every way the best sample of alley paving in Chicago. All the alleys in the business section should be paved in the same manner.

From a sanitary standpoint the paving of the alleys in the residence districts is frequently of greater importance than the paving of the streets. A wood pavement, sponge-like, will absorb the filth and garbage, while, unlike a sponge, the filth cannot be squeezed out of it. Every wood-paved alley is thus a continual menace to the health of the entire neighborhood.

Ordinances were passed at a recent meeting of the City Council for the laying of ten miles of brick pavement during the current year. Estimates have been made for the laying of forty miles additional. Many of the streets in the list of those to be paved are heavy traffic streets, where only the most durable pavements will give satisfaction.

The brick pavement in La Salle street, from Madison to Randolph, is practically as good as the day it was laid six years ago. The traffic over it is continuous and heavy. Dearborn street, from Jackson Boulevard south; North avenue, west from La Salle avenue; Ogden avenue, south from Madison, and Milwaukee avenue, north from Lake street, are among the thoroughfares which have been paved with brick, and the pavement has given universal satisfaction.

Chicago contains fifteen miles of brick pavement, all of which is reported in good condition.

A meeting of property owners on Twenty-second street, from Ashland to Western avenue, was held several weeks ago for the purpose of deciding upon the material to be used in repaving the street, one of the chief traffic streets of the western division of the city.

Three kinds of pavement were considered, but, after a thorough discussion, it was unanimously decided to use brick. Two street improvement associations have recently declared unqualifiedly for brick. These are straws which indicate the direction of the wind of public sentiment. The popularity of brick will continue to grow, provided brick pavements are conscientiously constructed, as brick pavements, like all others, may be laid either cheaply or well. After Chicago's long and bitter experience with cheap pavements, however, brick-paving contractors cannot afford to do cheap work. The price paid should be sufficient to enable the contractor to lay only a high-grade pavement. He should then lay the pavement in accordance with the specifications, and the city inspectors should properly perform their duties and inspect. If this course is followed, the future of brick is most brilliant. The field of operation is greater than can be found in any other city of the world, and, within the next five years, hundreds of miles of Chicago's streets and alleys will be permanently paved with brick.

I wish now to supplement what I have said with a few remarks of a more general nature, all of which, however, pertain to street paving.

The use of the grooved rail by the street railway companies of Chicago would double the life of the street pavements by dispersing the traffic over the entire street surface. It would be a boon to the street railway companies themselves and to their patrons, as there would then be no delays cause by the turning of heavily-loaded wagons out of the car tracks. The use of the grooved rail would directly benefit the city, as the saving in street cleaning and repairing would be enormous.

The day of automobiles is coming. Autotrucks, motor wagons and carriages propelled by electricity, gasoline or compressed air will within the next few years almost wholly supplant horse-drawn vehicles. Well-paved streets will then be an absolute necessity. The automobile owners will demand good streets and clean streets, and their demand will be complied with. Imagine, too, the enormous saving in street cleaning, when all of the horses, or even half of them, have been put out to pasture.

Chicago now contains 300,000 cyclists, every one of whom is a lover of good streets. If they would unite in an agitation for better streets, and would speak above a whisper, they would materially assist in bringing about the much-to-be-desired millennium.

The membership of the League of American Wheelmen has in less than one year fallen off 30 per cent. This great decrease in membership can be partly ascribed to the Spanish-American war, but I am yet of opinion that it can be chiefly ascribed to its control of racing. That is its sole reason for being, if one were to judge from the newspapers. It has a good-roads department, however, which has exerted great influence in bringing about an improvement in the condition of country roads. This work has devolved chiefly upon Mr. Otto Dorner, of Milwaukee, a modest and unassuming young man who has undoubtedly done more than any other person to convince the farmers of the country of their need of better roads. If the league would give up the control of racing, and devote all its energies to the cause of good roads and good streets, it would be the most influential organization of the kind in the world. Let it organize locally in each of the cities, interest the business men of the community, and commence an active and intelligent campaign for good streets and clean streets, and its membership would rapidly increase, while it would thus do more good in one year than it would in the control of cycle racing for a century.

The Board of Local Improvments of Chicago has declared that it is opposed to the laying of cedar-block pavements. This being the case it should say, as it has the power to say, in unmistakable terms, that no more cedar block shall be laid. The cedar-block specter should be hit in the head so hard that it will never again bob up.

The paving of a street improves business, empty stores find tenants, and the abutting realty is enhanced in value. The paving of one street in a poorly-paved section of the city congests traffic on the newly-paved street.

Whenever possible the streets of Chicago should be paved in systems. Two or more through parallel streets, as well as the connecting cross streets, should be paved at the same time.

The wear and tear of street pavements would be greatly lessened by the use of wide tires on vehicles.

The use of wide tires in the cities, as well as in the country districts of Illinois, would result in a saving of several million dollars a year in street and road repairing.

Chicago has no funds with which to repair and clean the streets. Without asking why, I would suggest that if the City Council would sell a few of the valuable franchises which it now so freely and lavishly gives away (so far as the public is concerned), and the money were honestly expended on the streets, the transformation scene would be startling in its suddenness.

No reasonable excuse can be offered for the present damnable condition of the streets. If Marshall Feld managed his business in the same manner as the city's business is managed, or mismanaged, he would be bankrupt inside of thirty days.

I agreed sometime ago to furnish the Clay-Worker with some photographs of Chicago's brick pavements. I made out a list of streets and gave it to a photographer. The photographer secured views of the streets, but as the photographs failed to show the kind of pavements on the streets, I made a personal investigation and found that I should have had him secure X-ray photographs. Subsequent excavations enabled me to ascertain that deep down under the dirt and filth the pavement was of brick, as I had supposed. When next I attempt to secure photographs of Chicago's streets I will make some arrangement with the street-cleaning bureau by which the bulk of the dirt is to be removed before photographs are taken.

The streets of Chicago will never be properly cleaned and repaired until this work is completely taken out of politics. The street problem will never be solved to the satisfaction of the public until the Department of Public Works is untrammeled and free. It should be made up of competent engineers who, being under no obligations to partisan rule, and absolutely free from the dictation of party bosses, can act solely for the good of the whole public. This most important department will always be in a more or less disorganized condition, and will be unable fully to render the high-class service which should be expected of it, so long as its personnel changes with every change of administration.

Finally, the condition of the thoroughfares of a city is a certain index to the condition of the city as a whole. Smoothly-paved and clean thoroughfares bespeak prosperity and good management. Rough, noisy and poorly-paved streets, filled with rubbish and filth, are a sure indication either that the city is financially impoverished or that its funds have been wasted or stolen.

CHICAGOANS.

They built a mighty city, in their strength,
With Babel buildings towering to the sky;
With palaces and temples filled with wealth,
And all the wonders only wealth can buy.

They fed with meat the armies of the world;
They bought and sold all grain by farmers sown;
Their commerce penetrated every land;
The wealth of every land became their own.

They gulped their learning in voracious gulps;
They doted on the arts, both fine and coarse;
Esthetics permeated each and all;
The mouthing of deep wit had made them hoarse.

With all their commerce, learning, art and wealth;
With optics and with noses upward turned,
They neither saw nor smelled the putrid filth
In every alley, waiting to be burned.

Nor did they see the foulness of the streets

W. F. PLUMB, Streator.

Through which, in haste, they wallowed day by day.
Their mental optics turned to higher things,
And would not deign to look on putrid clay.

Why should they care if streets remained unclean?
The streets, for all their care, might go to pot.
'Twas not their care if pavements would decay.
Let cedar block, like carion, lie and rot.
(Applause.)

President Townsend: I believe and hope that many of us will live to see many, if not all, of these improvements made. The next number on the programme is "Making Paving Brick—Not Cheap, but Good," by F. Plumb, of Streator.

Mr. Plumb: If brevity is the soul of wit, my paper is very witty. It will not take me more than ten minutes to read it, and the things you will find out that I do not know will bother a good many of you in days to come in determining some of the questions I have raised.

BETTER PAVING BRICK.

By W. F. Plumb.

In all the pursuits of men there is room for improvement. The manufacture of paving brick furnishes no exception to this general rule. Even now the situation demands better brick for paving uses; better brick than we are making; better brick than we ever knew how to make.

We are doing well—very well. In the last six or eight years we have improved the quality of our output very much. We understand our clays and shales better. We know more about proper grinding and screening, about burning and about cooling, to secure durability and toughness; yet the goal of that which is required and attaintable has not been reached.

Our competitors for public approval in street paving are granite and asphalt. We must, as far as practicable, get the good qualities of our competitors and discard the bad.

That which most recommends granite is its durability in use. That which most recommends asphalt is its smoothness and noiseless quality in use. Granite is noisy and hard on animals and vehicles. Asphalt is slippery and easily worn out with heavy traffic.

It then follows that we need a brick that shall furnish a smooth street surface to campete with asphalt in its best features, and a brick that possesses more of the toughness and hardness characteristic of granite than any we are yet making.

The more important of the above requirements is hardness and toughness. How shall these be secured? Will it be by finer grinding and closer screening, and this then to be followed by greater care in burning and then longer time in cooling?

Who has exhausted these problems, so that he can say the best processes have been found out?

To do any one or all of the above will cost money, but a better brick will justify the outlay.

We have been running up and down the gamut of size and shape in this matter, but have found, as yet, no peace.

I well remember when a paving block was manufactured and put down in this city and elsewhere, which block was four by five by twelve inches, having a total of 240 cubic inches. This block was found to be too large. It was not always properly burned, on account of its great size. Such blocks are not popular now. We have retreated from that size until now a good, acceptable brick has little more than one-third the cubic inches found in the large block.

The value of repressing has recently received a set-back by an article in one of our clay journals in which it is claimed in some of our clays a side-cut brick is injured by repressing.

The experiments made by Professor Orton, of Ohio, and the remarks of Professor Wheelock, of Missouri, in that article, based, as they seem to have been, on rattler tests, go to show that there is an induced lamination given to the side-cut block by the repress.

We are, then, finding out that the wearing quality is not in the large block, nor is it necessarily in the repress.

It is much more likely to be found in some of the other processes. Somewhere along here, by experiment, we shall find a brick that will have all of the essential wearing qualities of granite. When that is done the future of the paving is secure against the attack of any of its present competitors.

At best these discussions can only suggest the field in which these improvements are to be made.

We may find that when repressing the side-cut block that it must go into the mold on its edge. We may find that rounded corners had better be dispensed with. We may run counter to the set notions and demands of some of our city engineers who write specifications for street paving. City engineers have much yet to learn, in common with us. We shall make discoveries that will disturb pet ideas.

I have great respect for the rattler test and the crushing test, but somehow it seems to me that the absorption test may be somewhat misleading as to the real value of a brick. A block of glass would show well in the absorption test, but be so brittle as to be valueless for paving uses.

Let us not be disturbed if we finally get back to a brick the size of a common builder, and made on the side-cut plan, without having been through the repress.

Let me ask who can tell us how fine our shale should be ground to get the best results? Who, by actual experiment and observation, has gone to the bottom of this question? Do you get better brick by a complete and thorough course in the dryer? or is it just as well to send the brick from the dryer to the kiln, with the brick partially dried out? Is slow watersmoking better for the quality of the brick than rapid? which one of the two? When brick are burned, is two weeks' cooling better than one week? and would three weeks be better yet? Who can give us the bottom facts here?

A word as to materials and I will close. Many of the shale pits where our material is taken from show a marked difference in character and quality in the various layers that go to make up the whole mass. We have undertaken to mingle the whole mass together by cutting from top to bottom of the bluff. This is undoubtedly a proper thing to do. Now, how thoroughly should this be done? Are the ordinary methods of grinding and mingling all that is needed to get the best results? Would there be any value to be had in grinding our clay and let it stand in a mass several weeks or even months before sending it to the mill?

Much more might be said on the topic assigned me, but enough, however, to show that we have yet much to learn. The past has demonstrated our ability to improve. That we shall make great strides for the better I am confident, and that our greatest achievements in this direction will be found in the line of simplicity and painstaking methods.

President Townsend: That paper is full of good points, I am sure.

Mr. Pike: I would like to ask Mr. Plump if he has tested the degree of fineness to which that shale should be ground to make the best paved streets, considering toughness, structural points, etc.

Mr. Plumb: I have only my own observation. I am satisfied that we have annealed our brick too rapidly. It is only theory on the grinding. I am sure, if we grind our shale fine, we make better brick. If it is necessary for us to pulverize our shale, let us pulverize it as finely as flour. I have not experimented near as much along this line as I would like to.

Secretary Stoll: The next on the programme is a paper on "The Pottery," by Mr. Wolfe, of Peoria. If there are no objections we will give the paper to the trade papers and consider it read, as our time is somewhat limited.

(The paper is an excellent description of the modern methods of manufacturing pottery, and will be given in full in a subsequent issue of the Clay-Worker. —Ed.)

President Townsend: I regret this, but do not see how we can well do otherwise. The next number on our programme is a poem by Mr. D. O. Loy, of Atkinson.

Mr. Loy: Our meeting has been full and complete. I have had one of the best times I have ever had at a clayworkers' convention. I have said to our Programme Committee that I very much dislike to read or recite to tired audiences, and I beg to be excused. I have nothing in the way of a poem to tell you how to make brick or tile.

Secretary Stoll: We will now hear the

REPORT OF COMMITTEE ON RESOLUTIONS.

Whereas, The officers of this Association, having secured suitable space for the permanent display of the clay products of the State at the State Fair Grounds at Springfield, and

Whereas, A creditable display of this character will tend to attract attention to the value and importance of the clays and clay industries of our State, be it

Resolved, That the members of this Association be urged and requested to lend their individual efforts to secure a representative display of all clay wares by bringing the matter to the attention of clayworkers throughout the State urging those who have suitable materials to send the same to the Exhibition Building and to assist in the proper arrangement of the same, in order that the exhibition may reflect credit on the Association and redound to the benefit of the entire clayworking fraternity. And be it further

Resolved, That the State Board of Agriculture be requested to appropriate annually the sum of $250 for the proper care and maintenance of their displays.

Whereas, The State penitentiary at Chester, Ill., is manufacturing brick with convict labor and selling them in the open market in competition with the brickmakers in that locality, and

Whereas, This is unjust and will result in disaster to those who have capital invested in an industry the product of which is used in the building of homes and commercials structures, and which by right is entitled to protection from such unfair competition from a State institution, therefore be it

Resolved, That the individual members of this Association are requested to confer with their several representatives in the State Legislature and urge upon them the importance of remedying the evil by prohibiting the sale or use of brick made by convict labor for any other purpose than the use of the State. And be it further

Resolved, That a committee of three be appointed by the President to investigate the subject and devise plans for the empolyment of convict labor in the improvement of public highways and report at the next convention, offering such suggestions and remedies as in their judgment the situation requires.

Whereas, The success of this, our Twenty-first annual meeting, is most pleasing, the number in attendance showing a gratifying increase over that of former years, and the unflagging interest manifested in the work of the Association, assuring the same steady growth and influence that has characterized our meetings in the past, and

E. M. PIKE' Chenoa.

Whereas, The success of our Convention being in a large measure due to the city of Peoria and her efficient officials, they having afforded us unexcelled facilities for our convention work by furnishing free most comfortable and convenient hall and committee rooms for our meetings, and

Whereas, The worthy Mayor, Honorable John Warner, the City Engineer, A. D. Thompson, Mr. Frank Quinn, who officiated so graciously as toast master at the splendid banquet, the local committee of clayworkers, under the energetic direction of Chairman J. C. Madigan, each and all of whom have been untiring in their efforts to facilitate our work, as well as adding immeasurably to our social enjoyment, therefore, be it

Resolved, That the sincere thanks of this Association is due them one and all, and that we will ever hold Peoria in fond remembrance; and that we also extend thanks to the daily press of Peoria for the full reports they have given of our proceedings, and also to the National Hotel for ample accommodations provided for our bodily comfort. Our gratitude is due to Mr. George Wolfe, of the Peoria Pottery Company, for the very pretty souvenir button which will be preserved as a very pleasant reminder of our visit to Peoria.

E. M. PIKE, Chenoa, Chairman.
E. R. ROGERS, Alton.
J. PENNINGTON, Springfield.
Committee.

Mr. J. J. W. Billingsley: I move the adoption of the resolutions.

Motion seconded by Mr. Mamer and carried.

President Townsend: I will appoint on the Committee on Legislation F. Plumb, of Streator; Dr. A. L. Converse, of Springfield, and William Hammerschmidt, of Lombard.

Secretary Stoll: This brings us to the report of the Treasurer.

Treasurer Starr then read his report, showing a substantial balance on hand.

Mr. Mamer: I move that the rêport be accepted and placed on record.

Motion was duly seconded and carried.

Secretary Stoll then read his report, showing that the membership list was some larger than that of the year previous.

Moved by Mr. Pike and duly seconded that the report be accepted, which motion was carried.

Then followed the election of officers, resulting in the re-election of President Townsend, Secretary Stoll and Treasurer Stare, and election of Mr. C. C. Barr, of Streator, as Vice President.

Mr. Randall: I want to make a motion that, when we adjourn, we adjourn to meet the second Tuesday and Wednesday in January, instead of the third Tuesday and Wednesday, because it will be more convenient for us and will make no material difference to any one else. This is a personal matter with me. The date of issue of the Clay-Worker is the 15th of the month. We ought to have been out four days ago, but in order to make the report of the Convention in full we have deferred publication for a week. It makes no difference to the other papers; they are not due until the 1st, and if the Convention will agree to the change it will be a courtesy and accommodation to me. I move that the Constitution be changed accordingly.

Mr. Hammerschmidt: I would like to do anything that Mr. Randall wants, but I do think this is early enough in Janary. Right after the holidays our Township and County Commissioners hold their meetings, and I had to miss two important meetings.

Mr. Batley: I would second Mr. Randall's motion.

Mr. Plumb: I want to add a word. I would like to do as Mr. Randall suggests. There is another change I want to suggest, and that is in regard to our banquet. I think it ought to be changed to the last evening instead of the first. People come to the banquet and then go home, and I would suggest to the Secretary that he rearrange the programme so that the banquet be held the last evening.

Mr. Eudaly: I move as a substitute for Mr. Randall's motion that we leave this matter in the hands of the officers. I think questions of this kind should be given more attention than we are likely to give them at this time.

Mr. Billingsley: I move the substitute be laid on the table.

Secretary Stoll: I want to say one word in regard to this matter. The Constitution provides for the third Tuesday, and I would rather have the expression of the other members. I don't want this matter left on my hands.

President Townsend: I do not believe that there is a member of this organization but knows the value of the Clay-Worker to this Association. I do not believe there is a stronger or more earnest worker for this Association than Mr. Randall, and I want to do all I can to assist Brother Randall in the good work he has been doing and seems determined to carry on; therefore, gentlemen, I want you to vote for this question—that the meeting of this Association be changed to the second Tuesday.

Mr. Eudaly: I want to withdraw my motion for the substitute.

President Townsend then put Mr. Randall's motion, which carried unanimously.

Mr. Pike: There is another matter that I would like to bring up here, and I think you will all agree with me. We have a person here who has attended these meetings regularly for a number of years, and, I hope, will continue to attend for a number of years to come. I move that we elect Miss Wallace an honorary member of this Association for life. (Applause.)

Motion seconded and carried. There were cries of "Speech!" "Speech!" but, for once, Miss Wallace refused to talk.

Mr. Hammerschmidt: I move that we adjourn.

Seconded by Mr. Mamer and carried.

THE BANQUET.

The most pleasant and successful feature of the Illinois Convention was the banquet tendered by the brickmakers of Peoria, if one may distinguish one feature from another of a meeting every arrangement and detail of which seemed well-nigh perfect. From the moment of arrival till the last good-bye was said the visitors were made to feel that the town was theirs and all the contents thereof. But the banquet was a particularly happy affair. Early in the evening Chairman Madigan appeared in the lobby of the hotel with a fine orchestra, which at once proceeded to business and made the hour preceding the entry into the dining hall pass very quickly. At 9:30, the appointed time, marching orders were given, and, headed by Mayor Warner, the party marched into the spacious dining room. The tables were prettily decorated with flowers and candelabra. Plates were laid for one hundred, and nearly every chair was occupied. The music of clinking silver and china soon added to that of the orchestra. An excellent feast was served, as indicated by the following menu:

Blue Points.
Consomme Jardinere.
Celery.
Olives. Radishes.
Boiled Salmon. Hollandaise Sauce.
Parisienne Potatoes.
Chicken Patties.
Browned Potatoes. French Peas.
Boned Turkey. Aspic Jelly.
Boiled Ham. Tongue.
Mareschino Punch.
Stuffed Roast Quail. Cress.
Fresh Shrimp Salad.
Neapolitan Ice Cream. Assorted Cake.
Fruit. Salted Mixed Nuts.
Coffee.

With the lighting of cigars came the tap of the toastmaster's gavel. Alderman W. H. Carroll introduced Mr. F. J. Quinn as Peoria's brightest young lawyer and the toastmaster of the evening, and a master toaster he proved himself. In a very happy address he welcomed the guests and thanked them on behalf of the city for tarrying for a time within her gates. He was loudly applauded, as he deserved to be.

Alderman Thomas N. Gorman was introduced, and spoke to the toast, "Our Guests." Mr. D. V. Purington, of Chicago, responded in his usual entertaining style, and was followed by Alderman W. H. Lynch. "Our Hosts" gave Mr. W. A. Eudaly, of Cincinnati, an opportunity to orate, which he did most gracefully, though the first speaker of the evening to respond to a formal toast without manuscript. Mr. T. A. Randall, of Indianapolis, handled "Our Association" in a manner that elicited applause, and was followed by Poet Laureate D. O. Loy, of Atkinson, who toasted "The Ladies" in rhyme.

This completed the list of formal toasts, but, notwithstanding the hour was late, there was an evident desire for more of the same sort, and so impromptu speeches were called for. In turn, Mr. F. W. Moulton, Chicago; T. P. Plumridge, St. Louis; W. J. Woolley, Anderson, Ind.; Faucet Plumb, Streator; E. M. Pike, Chenoa, and John Madigan, of Peoria, spoke entertainingly. Songs by James Murphy and John Heiple, sweet singers of Peoria, were interspersed with the speeches, and the former brought the evening's entertainment to a close by leading in "Auld Lang Syne."

THE TRIP ABOUT THE CITY.

Wednesday forenoon was spent in viewing the city. A sufficient number of comfortable trolley cars were lined up in front of the National Hotel to accommodate all who wanted to go, and at 9:30 sharp the party trollied away under the guidance of the local committee, John Madigan, A. H. Kanne, Geo. Spurck, James Dalton and A. E. Giles. These gentlemen were untiring in their efforts to make the visitors happy, and succeeded so well that every visitor returned to his home firmly convinced that Peoria is the greatest convention city in the country.

The first stop was made at the Atlas Distilling Company, where the party was received by Mr. Adolph Woollen, who gave the party a cordial welcome, telling them if there was anything they didn't see and wanted to ask for it. This some of the bolder brethren did, and, after sampling it, decided to take some of it home with them.

Leaving the distillery, the party returned again to the trolley car, and were taken to Prospect Heights, from which a beautiful view of the Illinois river and valley were obtained. Prospect Heights is said to be the highest point in Illinois. The ride out to Prospect Heights consumed so much time that, after the party had spent some time at that place, they returned direct to the hotel, well pleased with the morning's recreation.

THE ANNEX.

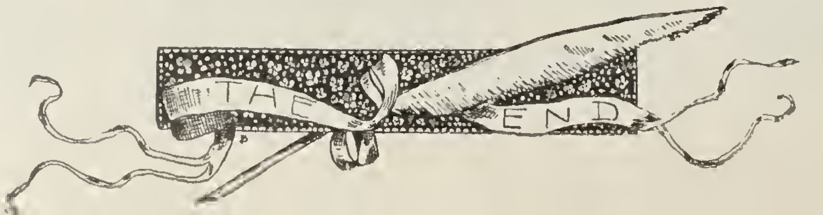
In a cosy ante-room in the rear of the Convention Hall were exhibted charts of improved kilns, a model of Grath's new coking furnace, specimens of brick and fireproofing made of washed clay from the works of F. Lehman & Co., Chicago, and sample brick of various sorts. Over and above all was a variegated mass of trade literature comprising the catalogues and circulars of most of the leading clay machinery manufacturers. Mr. Purington contributed to the wall decoration a fine lithographic view of the works of the Purington Paving Brick Co. at Galesburg. The clay journals were all in evidence, and an ample supply of the little red hat calendars of the Clay-Worker disappeared almost as if by magic. We surmise that not all of them were pasted in the headgear of the visitors as intended.

The annex is the "green room" of the Convention, and was the scene of no little hilartiy. Here the Knights of the Grip gather and swap tales of trade and social conquest that ofttimes rival in warmth of color Arabian Night's Tales.

Among the exhibitors were the Wallace Manufacturing Co., Frankfort, Ind.; H. Brewer & Co., Tecumseh, Mich.; the American Clayworking Machinery Co., Bucyrus, O.; Woolley Foundry and Machine Co., Anderson, Ind.; Frost Engine Co., Galesburg; Leader Manufacturing Co., Decatur; E. M. Freese & Co., Galion, O.; Elder & Dunlap, Bloomington; E. M. Pike, Chenoa; F. E. Swift, Washington; W. A. Eudaly, Cincinnati; Illinois Supply and Construction Co., St. Louis, and F. Lehman & Co., Chicago.

LIST OF MEMBERS.

Chas. Piester, Abingdon, Ill.
T. Townsley, Alexis, Ill.
E. Rogers, Alton, Ill.
W. J. Woolley, Anderson, Ind.
D. O. Loy, Atkinson, Ill.
Lincoln, Solfisburg, Aurora, Ill.
Albert Solfisburg, Aurora, Ill.
H. F. Townsend, Avon, Ill.
G. A. Tompkins, Avon, Ill.
Elder & Dunlap, Bloomington, Ill.
American Clay Working Machinery Co., Bucyrus, Ohio.
John Hull, Cambridge, Ill.
Mamer Bros., Campus, Ill.
Geo. Gillen, Cantrill, Ill.
W. P. Ball, Carbon Cliff, Ill.
J. W. Stipes, Champaign, Ill.
Geo. J. Walter, Chasworth, Ill.
E. M. Pike, Chenoa, Ill.
William Simpson, Chicago.
D. V. Purington, Chicago, Ill.
Geo. H. Hartwell, Chicago.
Windsor & Kenfield, Chicago.
F. Lehmann, Chicago.
H. B. Skeele, Chicago Heights.
W. A. Eudaly, Cincinnati, Ohio.
G. H. Wessels, Crescent City, Ill.
Davis Brown, Decatur, Ill.
L. H. Martin, Dwight, Ill.
H. L. Hix, Earl Park, Ind.
D. E. Kretsinger, Egan, Ill.
H. C. Patton, Flanigan, Ill.
W. R. Cunningham, Frankfort, Ind.
W. S. Purington, Galesburg, Ill.
F. G. Madison, Galesburg, Ill.
Frost Manufacturing Co., Galesburg, Ill.
Freeze & Co., Galion, O.
J. J. W. Billingsley, Indianapolis, Ind.
T. A. Randall, Indianapolis, Ind.
F. Adams, Indianapolis, Ind.
C. E. Steinmeyer, LaSalle, Ill.
J. W. Kirpatrick & Co., Litchfield, Ill.
Wm. Hammerschmidt, Lombard, Ill.
R. McShane, Lostant, Ill.
F. A. Martin, Mazon, Ill.
Mendota Tile and Brick Co., Mendota, Ill.
C. O. Pellett, Murphysboro, Ill.
J. M. Powell, Orestes, Ind.
D. T. Lorriaux, Ottawa, Ill.
E. W. Bach, Ottawa, Ill.
E. J. Hess, Ottawa, Ill.
J. P. Middlekoff, Paxton, Ill.
John Jensen, Pekin, Ill.
John Madigan, Peoria, Ill.
B. Wookey, Peoria, Ill.
Wm. Malone, Peoria, Ill.
A. E. Giles, Peoria, Ill.
Kanne Bros., Peoria, Ill.
Spurck Brick Co., Peoria, Ill.
Wm. Fox, Peoria, Ill.
M. Dering, Peoria, Ill.
Geo. French, Polo, Ill.
M. Smith, Secor, Ill.
John Pennington Springfield, Ill.
F. Plumb, Streator, Ill.
T. C. Tridell, Streator, Ill.
C. C. Barr, Streator, Ill.
W. L. Ross, Streator, Ill.
W. P. Grath, St. Louis, Mo.
T. P. Plumridge, St. Louis, Mo.
L. H. Lambert, St. Marys, Ill.
H. Brewer & Co., Tecumseh, Mich.
Oliver Tillbury, Towanda, Ill.
J. W. Skinner, Varna, Ill.
F. E. Swift, Washington, Iowa.
C. O. Swift, Waverly, Ill.
G. C. Stoll, Wheaton, Ill.



PACIFIC COAST NEWS.

LOCALLY speaking, the brick and clay industry is very quiet, and may possibly remain so for some time. The building trade usually does not start up before March or April, and even when it does the yards have a plentiful supply on hand—enough to keep the building trade going for quite a while. In looking the facts straight in the face, the prospects at present are not over encouraging to the manufacturer. However, a few months may change the whole situation. Let us hope so. The country trade is more promising, and the outlook for export trade is good. The Hawaiian islands trade is increasing all the time, and the prospects are that it will continue to do so for a long time to come.

The sewer pipe trade has been very fair, and it promises to increase greatly this year. The rains that ushered in the new year have caused a very hopeful feeling to prevail throughout the trade, and California now feels safe from a repetition of last year's drought, and confidence, which was lacking somewhat, is now fully restored throughout the State.

Bryant Bros., who recently located in Phoenix, Arizona, from Colorado, have started work on a new brickyard near that city. The yard will have a daily capacity of 10,000.

Marshall & Deeds will open a brickyard at Enterprise, Utah.

The Crocker Estate Co. will erect a seven-story building on Post street., San Francisco. The exterior of the structure will be of brown pressed brick and terra cotta, with stone trimmings. The cost of the building will be about $200,000, and it is to be fire-proof throughout.

The Washington Brick, Lime and Manufacturing Co., of Spokane, Wash., is to begin at once to double the capacity of their brickmaking plant at Spokane, Wash. The company also owns the large brickmaking plant at Clayton, and the lime kilns at Springdale, and has also decided to greatly improve all of their plants. The original plant at the Spokane works cost $10,000, and $5,000 additional will be spent in doubling the capacity.

D. McCarty has discovered a bank of clay at Santa Monica, Cal. He was excavating, and at a depth of about 14 inches he struck a stratum of compact clay, almost entirely free from sand, of uniform consistency, and showing a smooth polished surface when cut with the spade. The clay is of a dark rich brown when first taken, and when exposed dries to a lighter brown. The deposit seems to be extensive, and the quality of the clay seems to improve as the excavation progresses. Assays and experiments will be made to determine the real value of the clay and its usefulness in the arts.

Herman Steinhouer, of Greenleaf, Oregon, has just finished burning an experimental kiln of 1,500 brick, the first ever burned on that side of the mountains. The bricks were perfect, and as the clay is of a very superior quality for brickmaking, burning on a large scale will be started next summer.

The Riverside, Wash., brickmaking plant has closed for the winter.

A deposit of clay suitable for making pressed bricks has been discovered near Vancouver, B. C., and arrangements are being made to establish a compressed brick factory near that city.

It is said that negotiations are under way for re-opening the brickyards on the islands near Tacoma, Wash.

A brickyard is to be started this month near Walla Walla, Wash. The company will have a capital stock of $50,000, and the work will be carried on on a large scale. It is expected that the works will be in operation by Feb. 1 SUNSET.

THE PASSING OF OLD "AUNT RITTA."

Henrietta Bacon (better known as "Aunt Ritta") died Sunday night at 11 o'clock at the residence of Mr. and Mrs. John W. Sibley on the South Highlands. She was upwards of 100 years of age, and succumbed to an attack of grippe after an illness of two weeks.

She has been in Mrs. Sibley's family for four generations, having served as her grandmother's waiting maid in her young ladyhood. She was a genuine type of the ante-bellum Southern negro, whose loyalty and devotion to her mistress was beautiful and unwavering. When the slaves were emancipated she refused to leave her mistress, and upon her death her allegiance was transferred to the daughter (Mrs. Sibley), and has remained with her constantly to the present time. The family cared for her as tenderly as one of their own blood, and mourn her departure with keen regret, realizing that her type is fast disappearing. One of the sweetest incidents of her old age was the sitting for a picture last year (see page 227, March, 1898, Clay-Worker) with little Hettie Sibley, the great granddaughter of her first mistress, thus linking together the dawn and close of the century. Her remains will be carried back to Georgia this morning and laid to rest in the family burying ground. As is the case with most of her class, she was deeply religious and died happy in her faith.

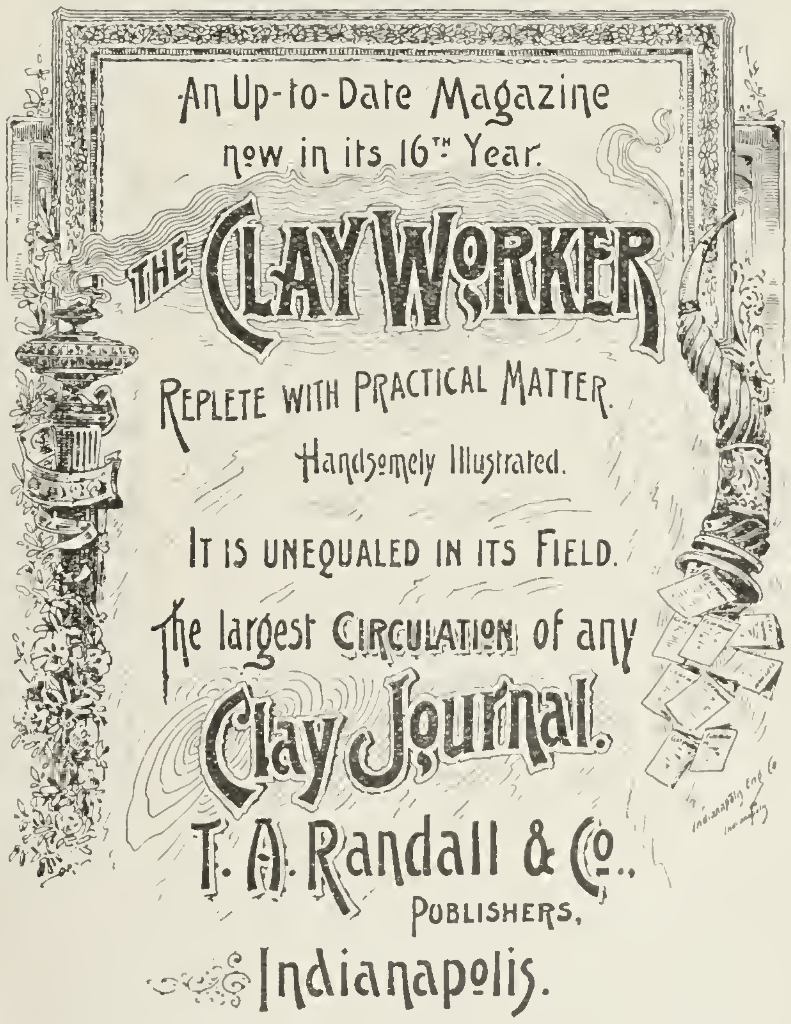
A simple service was held over her remains yesterday afternoon. Up to the time of her death she was still energetic and took an active part in the household duties.—Birmingham Age-Herald.

CHICAGO TO COLUMBUS.

Those Who Can Go That Way Invited to Join the Party Chaperoned by Gates and Purington.

Dear Randall—Purington and I would suggest that you ask those coming through Chicago to write early for sleeping-car reservations to H. R. Dering, Passenger Agent Pennsylvania lines, northwest corner Clark and Jackson streets, Chicago. He agrees to reserve sufficient cars for the accommodation of those attending, and take good care of them on the trip, and it is undoubtedly the most convenient line, and the trip in a body has always been jolly.

The train will leave the Union Passenger Station, Canal and Adams streets, Chicago, Monday evening, Feb. 6, at 8:15, and arrive in Columbus at 7:30 the next morning. We are anxious that every one should have a lower berth in the center of the car, and while we are willing and anxious to pick it out for each of them, we still suggest that they write direct to the man who is trained to the business. GATES.



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Indianapolis.

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Indianapolis, Ind.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

Terms of Subscription:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

Advertising Rates

Furnished on application. The Clay-Worker is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

Vol. XXXI. JANUARY, 1899. No 1.

CURRENT COMMENT.

The new year makes a brave start, and, apologizing for the "slanguage," we are right in it.

* * *

The Peoria Convention, the first of the year, was a most gratifying success, vide the full report in this issue.

* * *

The preceding pages are themselves sufficient excuse for the lateness of the Clay-Worker this month. Like a good dinner, it will be the more appreciated for the waiting.

* * *

The clayworker who cannot enjoy the feast of good things in this spread is certainly the exception. He must truly have a bad case of mental dyspepsia, and is deserving of keenest sympathy.

* * *

Especially so when it is remembered that this is but a foretaste of the good things that will follow the coming month, when we will give a full verbatim report of the National Convention; then, indeed, may "good digestion wait on appetite."

* * *

Every indication points to the largest N. B. M. A. Convention in the history of that body. Expansion is the rule of the hour, and the coming annual gathering of the brickmakers of the Nation will be up with the times. The programme (see page 28) speaks for itself. Every clayworker in the land who can do so should arrange to attend and take an active part. Remember, the date is Tuesday, Feb. 7.

* * *

The arrangements for the display of specimen clay products, mechanical devices, etc., etc., in connection with the coming National Convention are all that need be desired. The Executive Committee has provided ample space for all who may want to exhibit anything of special interest to brickmakers. This space is absolutely free. There is no charge of any sort in this connection, and but the one restriction, namely, that exhibits be closed during Convention hours. Every exhibitor should be as ready to abide by this rule as he is to accept the space provided through courtesy of the National Association.

REDUCED RAILROAD RATES TO COLUMBUS.

Those attending the National Convention from points west of the Mississippi river, excepting St. Louis, should use mileage when they can or buy tickets only to points across the river, and then repurchase through to Columbus, taking the necessary certificate, which will entitle purchaser to a return ticket at one-third the fare paid from the point east of the river. The New England, Southern, Eastern and Central Traffic Associations each grant the two-thirds rate on certificate plan, as in former years, the Western Passenger Association alone refusing to extend that courtesy.

TO THE MEMORY OF JAMES TAYLOR.

It is with more than ordinary sadness we record the death of our friend, James Taylor, of Port Monmouth, N. J., and we are sure that many, if not most, of the readers of the Clay-Worker will read of his departure with unfeigned sorrow. He had been so long a favorite contributor to these columns that he had become much beloved personally. He will be especially lamented by those who have long known him as a leading spirit and wise counsellor in our annual conventions. There he was at his best, if so well rounded a man could be said to be better in one character than another. He died Dec. 24, yet we had only a few days previous received a most cordial personal letter from him, dated Dec. 19, full of his sunshiny humor and kind greetings, winding up with, "I have had a good measure of health, and have been able to do some small work, but my health will not allow me to undertake any serious or continuous work, so I must rank with the loafers. I am looking forward with hope to our reunion at Columbus in February, and pray that I may not be disappointed. Give my kindest regards to your good wife and the children, and may the gift that maketh rich and addeth no sorrow thereto be yours all through this lower journey and rest come at last." "Rest" came all too quickly for our friend, who we will mourn in the years to come. His absence will be felt at our annual Convention, and his contributions to the literature of his profession will be missed sadly, but through the printed records and in the recollections of those who knew him best, he will still live on, and his labors bear rich fruit long years after his mortal remains have turned to clay.

"So calm, so constant was his rectitude,
That by his loss alone we know its worth
And feel how true a man has walked with us on earth."

THE SPIRIT OF PATRIOTISM.

"My country, right or wrong," is the proper motto of every citizen of every land. It is the only true test of patriotism. It does not follow that we must in our personal opinions believe that every measure determined upon is the wisest possible thing, but it does mean that when any given measure is agreed upon, every man, woman and child should do their best to make it a success. This is especially true in a republic where the will of the majority is the law. The minority must not sulk or render assistance grudgingly. That is the most cowardly species of treason. A year ago, when the war-cloud was hovering in the horizon, a great many men doubted the wisdom of making war upon Spain in the interests of humanity alone, but things drifted that way and the war came. It was short and sharp, because when it came all loyal Americans rendered moral and material aid under the inspiration of the motto, "My Country, right or wrong." Spain has been conquered, and peace now reigns, but the sequences of the war are likely to imply more than mere physical force. The higher order of statesmanship is to be developed and applied. The responsibility of those in authority is great. Whatever they may agree upon is to be carried out in the spirit of, "My Country, right or wrong."

ALL'S WELL AT THE SMOKY CITY.

In an interesting letter Mr. W. E. Sankey, of the firm of Sankey Brothers, the well-known brickmakers of Pittsburg, states that business in the "Smoky City" is as good as it has been for some years past. They and the other brickmakers there have had a good season; both of the Sankey plants have run steadily through the year, and will continue as long as weather will permit. Stock brick are selling at $11.00 to $12.00. They recently booked an order for half a million for the Woodville County Home. The prospects are good for a still busier season the coming year. The brickmakers of Pittsburg are still operating on the same old plan of each one for himself, and has Satanic Majesty for the hindmost. Just now there is considerable talk of attending the National Convention at Columbus, and it is safe to predict there will be a good big Pittsburg delegation there. Perhaps after enjoying Buckeye hospitality for a few days, and recounting the good times they have had together in the past, Pittsburgers may be more in the mood to consider favorably the idea of forming a local organization. The idea is all right if it can only be carried out.

LEGISLATIVE REFORMS.

This is the season of legislation. We, the people, are devoting a few days to the posting of our public books and investigating the business of the year just ended and the preparing for the future, but as it would be inconvenient for us all to meet at one time and in one place, we have delegated a few to speak and act for us, agreeing to abide their decision, for the time being, at least, though reserving the inherent right of every high-born American to kick at what does not suit us, and there is always enough of that to make things lively the balance of the year.

So far as has been developed there is but one purpose in view in the several Legislatures, and in Congress as well, and that is, to reform things, giving the appearance that this is emphatically a period of reformation. There is hardly a department of government, State or National, that is not threatened with reform of some kind or other; whether the result will be any betterment or not remains to be seen, or whether all things will not continue substantially as they have been, need not seriously disturb any one. One thing seems already manifest, there is to be no modification of the law that bread is to be earned by hard work, and the best, if not the only, way to accumulate is to lay aside a portion of what any labor produces. No legislation can alter this dictum.

THE REASONS FOR THE FAITH WITHIN US.

It is only because we believe that the annual meeting of such a body of men as constitute the N. B. M. A. is of immense value to our industry that we so earnestly insist that every up-to-date brickmaker should be there. Reviewing the achievements of the last years in the science and art of brickmaking, and the art of disposing of the produce of our yards, and calling to mind the many valuable hints which have been dropped at our conventions, not througn the well-prepared papers only, but as well through the impromptu discussions of those not accustomed to public speaking, but original thinkers, we cannot divorce the Convention from this progress, or refrain from urging a large attendance. Of course, we expect our old fellow workers, we mean our quondam, not old in years but in service—a convention would hardly be complete without them, but we want new blood, even young blood. It is astonishing how much the pleasure and profitableness of such a gathering is enhanced by the presence of new members. It broadens our vision of the field. One hardly knows how many men of large business capacities and larger social qualities are engaged in brickmaking until he meets them in Convention, and when every succeeding meeting introduces new members, no matter what may be their ages in years. Though we are all young, we are glad to greet men younger than ourselves, and to impart useful knowledge to them while we partake of their youthful enthusiasm.

While we maintain that a well-conducted trade journal is the chief agency in improvement and advancement in any industry, specially when it consists in the experiences of practical business men, not in clippings and carpings, yet the Convention is so inwrought with the journal as to hardly merit a second place. There is much in the word of mouth that cannot be conveyed through the pen and cold type, and then there is that flow of sociability which remains a memory and an inspiration until the next Convention. We have so often urged the members to bring their wives, who are entitled to a mid-winter vacation, that is is hardly necessary to repeat the invitation. Those who do take their wives, their daughters or their sweethearts to Columbus, will sow the seed for many pleasant reveries in the days to follow. The Columbus ladies are going to make it very pleasant for their guests.

TRADE LITERATURE.

WITH THE NEW YEAR there comes renewed life and energy in all lines of trade, and the printer's art is just now being drawn on for trade purposes more extensively than ever before, and modern methods and facilities are producing effects that a few years ago would not have seemed possible, except in rare and costly works of art. The trade catalogue of to-day is a work of art, the letter-press and engraving passing in excellence and effect anything of the sort ever before produced. At least this is true of those coming to the Clay-Worker sanctum.

One of the best examples we have seen bears the imprint of the Wallace Manufacturing Co., Frankfort, Ind. The cover is a very dark chocolate brown, and on the front leaf "Industry," in the attractive form of a maiden of the old school, holds in her outstretched hand a red brick, as if saying, "See, it is a perfect brick, the product of the Wonder brick machinery." Within the covers we find a series of beautiful half-tone engravings of the several sizes of Wonders, cutting tables, both end and side-cut, tile tables, pug mills, clay crushers, dry pans, clay hoists, elevators, trucks and other brickyard supplies. They will gladly send a copy to any Clay-Worker reader who is interested in stiff-clay machinery.

THE CHAMBERS BRICK MACHINERY is the title of a large and attractive book received from Messrs. Chambers Bros. & Co., Philadelphia, Pa. It is their fifteenth catalogue. and comprises 120 pages of interesting matter and illustrations. The first of the latter is a portrait of Cyrus Chambers, Jr., president of Chambers Bros. Co., "the first American inventor to successfully reduce to practice an automatic cutter for continuous stream brickmaking machines." Next follows a carefully-arranged table of contents, which enables the seeker after information relative to any particular machine or device to turn to it quickly. This is important, inasmuch as the catalogue includes a full line of stiff-clay machinery and all the accessories and appliances used in making stiff-clay brick on the modern yard, from a steam engine to an ash scoop. At the beginning they quote the standard size of common building brick as adopted by the N. B. M. A., namely, 8¼x4x2⅜ inches. Then follows an interesting treatise on their machinery, each feature of which is carefully described and illustrated. A copy of this valuable book will be sent free to interested parties, who are requested, when writing for it, to mention the Clay-Worker.

FROM FAR-AWAY SPOKANE comes a neat little pamphlet bearing the imprint of the Washington Lime, Brick and Manufacturing Co., announcing that that company is manufacturing dry-press brick, both square and ornamental, of a very superior character. They make a white brick and a granite brick that are proving very popular; also vitrified paving brick and sidewalk tile, likewise a line of fire-clay products and stoneware pottery.

THE JEFFREY MFG. CO., Columbus, O., have issued a special catalogue treating on electric locomotives which are particularly adapted for mining purposes. It is handsomely illustrated and will prove valuable to any one interested in that line. A copy can be had for the asking. The same company is mailing a little pamphlet illustrating and describing their new Columbian separator screen and bolter for the manufacture of cement, a device that has some peculiarly valuable features. As will be seen by referring to their ad. on page 73, they manufacture a full line of link belt chains and elevators. For samples, etc., address them direct.

"EXAMMINE ME INTERNALLY" is the catchy title of a leaflet from the Crescent Manufacturing Co., Shoustown, Allegheny Co., Pa. Following the injunction, we find cuts similar to those appearing on page 65, with the story of the Eureka Clay Screen briefly told. Those interested in the screen problem will do well to send for a copy.

THE ATLAS BOLT AND SCREW CO., Cleveland, O., are distributing a handy little pocket memormandum book containing calendar for 1899, atlas of the United States, rates of postage and much other general information. Drop them a postal card and they will do the rest.

A MEMORANDUM CALENDAR PAD comes with the compliments of the Menomonie (Wis.) Hydraulic Press Brick Co., with the cheerful announcement that their 1898 business far exceeded that of the previous year, and they have reason to hope that 1899 will do still better. "Hope tells a flattering tale," but we trust they may realize their fondest hopes, and send us another calendar a year hence with still happier tidings.

WE ARE indebted to the Chattahoochee Brick Co., of Atlanta, Ga., for a transparency of the battle of Manilla Bay. The view is startling in its action, depicting something of the terrors of a naval battle. Holding the picture to the light, there comes to view above the smoke and fire of the guns the officers and crew of the good ship Maine,

"Looking down at their shipmates,
Through a halo of light,
Avenging their death
In the Manilla Bay fight."

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- "777" Brick Machine.
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- Daytonian No. 2 Brick Machine.
- No. 3 Brick Machine.
- No. 1 Combination Brick Machine and Pug Mill.
- No. 2 Combination Brick Machine and Pug Mill.
- Sewer Pipe Presses.
- Victor Repress.
- Columbian Repress.
- No. 3 Perfection Hand Brick Press.
- No. 3 Perfection Roofing Tile Press.
- No. 3 Perfection Dry Press.
- Nos. 1 and 2 Perfection Hand Presses.
- Clay Separators.
- A-1 Automatic Cutting Table.
- A-2 Automatic Cutting Table.
- Imperial Automatic Side Cutting Table.
- Unique Board Delivery Automatic Cutting Table.
- Triumph Side Cutting Table.
- Novelty Board Delivery Cutting Table.
- Combined Tile and Hollow Block Cutting Table.
- Double Shaft Pug Mill.
- Compound Geared Pug Mills.
- Single Geared Pug Mills.
- Clay Conveyors.
- Cup Elevators.
- Clay Screens.
- Dry Pans.
- Engines and Boilers.

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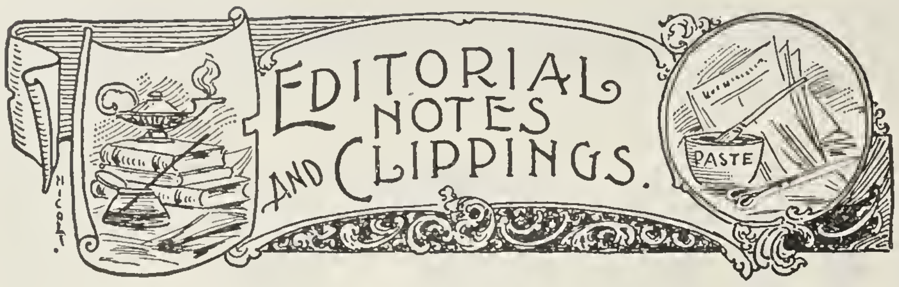
- Bevel Geared Winding Drums.
- Winding Drum Fixtures.
- Tempering Wheels.



Glidewell Bros. will start a new brickyard at Tullahoma, Tenn.

N. E. Ringsak, Mancos, Col., desires to receive catalogues of brick machines.

C. W. Neff contemplates the establishment of a brick plant at Johnstown, Pa.

William Emen, DeKalb, Tex., writes that he wants to buy a dry-press brick machine.

Z. Fielder, Hannibal, Mo., writes that he wants a good second-hand stiff-mud brick machine.

A. Brewster & Sons are making plans for the establishment of a brick plant in Pine Bluff, Ark.

A large paving-brick plant in which Lewis Harper is interested will be established at Conneaut, O.

Herbert F. Duns has purchased the interest of Frank W. Swallow in the brickyards at Exeter, N. H.

J. C. Glimpse, of Carlock, Ill., writes that he is in the market for 20,000 to 25,000 pallets 10x34 or 35 inches long.

George Weifenbach, Apartado 256, Guadalajara, Mexico, writes that he wants to buy machinery for making drain tile.

The Windfall (Ind.) Manufacturing Co. advise us that they are in the market for a machine for manufacturing drain tile.

A correspondent at Salt Lake City writes that the brickmakers there have had a very good season, with prospects good for a good trade this year.

The Gate City Brick Co. has been incorporated to manufacture brick at Kansas City. The incorporators are J. H. Looney, John H. Doane and George Hey.

The Suburban Brick Co. has been incorporated at Wheeling, W. Va., with a capital stock of $500,000. George O. Robinson, B. F. Hogeman and others are interested.

In a recent letter, F. H. Eggers says the Cleveland brick manufacturers are all running full time. He says they are still putting in sewers in his city as lively as in the summer time, and this helps keep the brick men busy.

The Bonnot Co., Canton, O., write that they are very busy, having contracts on hand amounting to nearly $1,000,000 carried over from the previous year. Orders for represses and automatic cutting tables are coming in very satisfactorily.

O. Hensel, of New Ulm, Minn., writes that Mr. Aufderheide, of New Ulm, and A. C. Ochs, of Springfield, Minn., have decided they can get better results by burning their brick in permanent kilns, and will each of them put up permanent kilns in the near future.

The recent election of the Board of Directors of the Builders' and Traders' Exchange at Omaha, Neb., resulted as follows: President, A. J. Vierling; vice-president, J. Fred Smith; treasurer, W. C. Bullard; secretary, W. S. Wedge. The latter reports the Exchange in a very prosperous condition.

The Atlas Bolt and Screw Co., Cleveland, O., in a recent letter say: "We have a number of inquiries for dryer cars and have recently gotten up an all-angle steel car, which sets low on the track and is economical in every respect. Our line of steel dump cars are meeting with a ready sale, and those needing first-class and durable equipment will get these."

J. B. Morrison, superintendent of the Elgin (Tex.) Press Brick Co., writes that trade is very good in that section, with good prospects. He says if the State Railroad Commissioners and the railroads can get rates properly adjusted again, their business will improve materially, as heretofore the freight rates have cut them off from a great deal of their territory. Mr. Morrison says they are still running their plant the same as in the summer.

In a recent letter inclosing subscription the Washington Brick, Lime and Manufacturing Co., of Spokane, Wash., write encouragingly of the trade and prospects in that vicinity. During the past year they have rebuilt their plant at Clayton, Wash., which was destroyed by fire, and are in better condition than ever to supply their growing trade, and are about to install a complete sewer-pipe plant in connection with their works. If possible, Mr. J. H. Spear, the secretary and treasurer, says he would like to attend the Columbus Convention.

A. O. Jones has a brick handler to load from truck to railroad car. The device will save several hands and avoid chipping of brick. Mr. Jones will show the new apparatus at Columbus during the Convention.

Zanesville, O., brick men have enjoyed a very busy season. Most of them have sold out their entire stock and are now enlarging and improving their plants, getting ready for a heavy spring trade. Every indication points to a large demand for brick the coming season.

Jas. N. Hensley, the well-known representative of the Monarch and new iron Quaker brick machine, has just returned from a trip south through Arkansas, Mississippi and Tennessee. He tells us that he took orders for three complete Monarch outfits and also for three Quaker outfits. Mr. Hensley reports the outlook for business for 1899 very flattering indeed.

Groman Bros., South Bethlehem, Pa., in sending in their subscription, say they have had a very good season, having sold all their brick and have orders on hand for 1,000,000 brick ahead. In order to meet the increasing demand they are putting in a Standard steam dryer, Chambers, Bros. & Co. stiff-mud machine and double-die repress. They expect to have everything in shape to be running the first of February.

A NEW CROP OF CALENDARS.

Prosperity is in the air, and finds expression in many different ways. One of the sure indications is the number and character of calendars sent out by advertisers. The 1899 crop is the largest and finest we have ever harvested. They come from all quarters, and are as varied as a maiden's fancies. The first arrival was a large, elegant lithograph of the famous picture, "Neighbors," bearing the modest imprint of the Frost Manufacturing Co., Galesburg, Ill. There is a maximum of picture and a minimum of calendar.

From the Canton and Cleveland Brick Co., Canton, O., comes a beautiful combination of chromo and calendar about equally divided. At the top is an excellent reproduction in colors of Moran's great painting, "The Atlantic at Sunrise."

The Marion (O.) Steam Shovel Co. have a handsome hanger of original design executed in fine style. "Invention's Gift to Labor" is the theme, and it is charmingly depicted. To the left a lovely female figure points to a Marion steam shovel suspended in bold relief before a background of the globe, making doubly forceful the words beneath, "used in all quarters of the globe." On the right hand stands a typical "Paddy," his shovel and pick discarded and a look of gratitude on his face, which says as plain as words, "It's a lot of hard worruk yez saves me." This calendar is certainly one of the best of the season

H. C. Baird & Son, Park Hill, Ont., have favored us with a large and handsome calendar. Grouped in a mass of graceful scroll work and appropriate lettering are views of stiff-clay and soft-clay brick machinery and supplies for which they are the Canadian agents.

Reese-Hammond Fire Brick Co., Pittsburg, Pa., contribute a medium-sized but very acceptable wall calendar. It is a lithograph in plain black and white. The central figure is a plump baby boy soldier, standing with sword in one hand and the stars and stripes in the other. Beneath is the catchy inscription, "I'se no 'Paniard."

Another, similar in execution, but bearing the likeness of a soldier older grown, and one dear to the hearts of every member of the Illinois Clayworkers' Association—big, hearty Will Hammerschmidt—bears the compliments of the Lombard (Ill.) Brick and Tile Co.

The Brockway Brick Co., Fishkill-on-Hudson, N. Y., remember us with a timely pictorial calendar entitled "Our Army and Navy." Upon the front page, above their own imprint, is a portrait of President McKinley over which floats Old Glory, and the eagle proudly soars, bearing the laurel wreath. There is a page for each month, and each one is decorated with a portrait of a hero of the war.

An exceptionally appropriate and very unusual offering comes from the Northwestern Terra Cotta Co., Chicago. It is a dark-red terra cotta tablet, 12x14 inches, richly ornamented in low relief. The center of the plate bears the name of the donors and a neat tablet or calendar pad that can be renewed from year to year as time flies leaving in its wake the memory of these trifles that make up the sum of life.

The "Monarch" BRICK.... MACHINE,

Unquestionably the

Leading Horizontal "Soft-Mud" Machine.

More in use than other of its class.

* * *

The "Iron Quaker" Brick Machine

Unquestionably the

Leading Upright "Soft-Mud Machine.

Horse and Steam Power.

More "Quaker" Machines in use than any of its class.

HERE'S ANOTHER GOOD ONE.

P. E. ANDERSON & SONS.
MANUFACTURERS OF
Brick and Drain Tile.

Chesterton, Ind., Oct. 17, 1898

The Wellington Machine Co.,
Wellington, Ohio.

Gentlemen.-

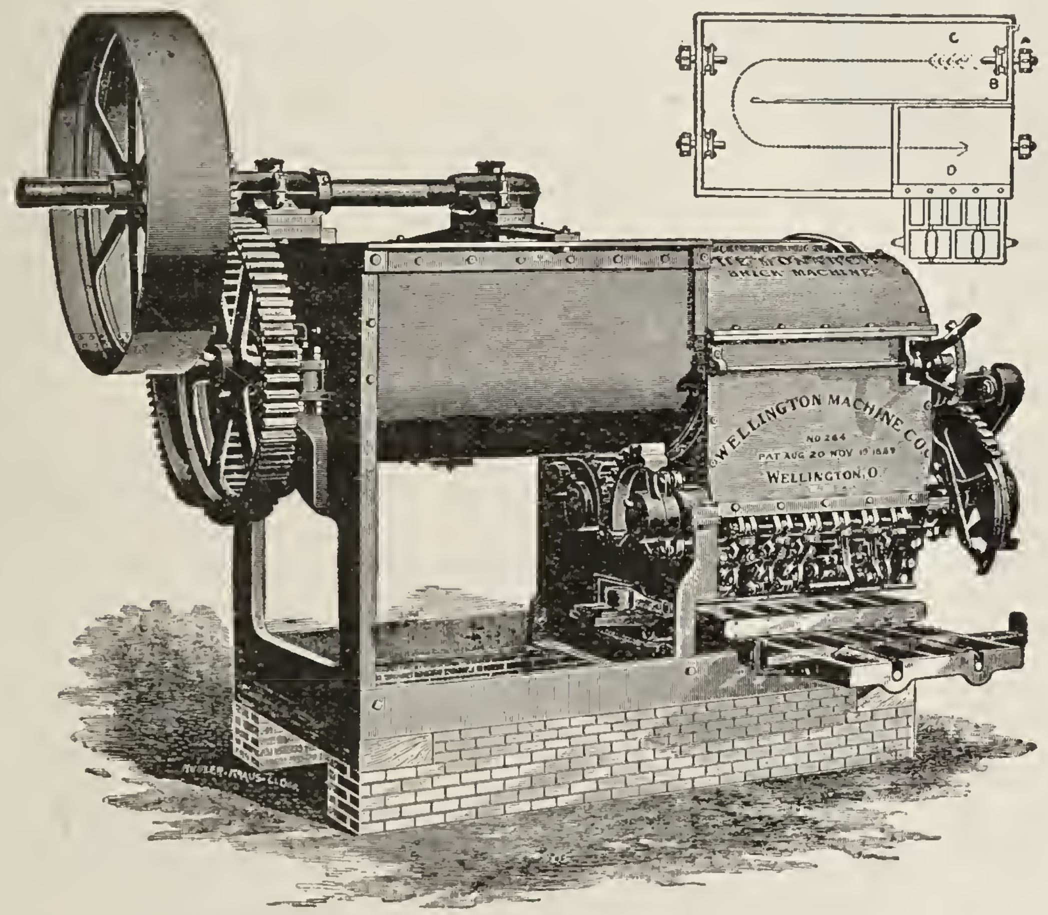
Yours, inquiring how we like the "Monarch" Machine purchased of you, received. We beg to inform you that the machine does all that you claim for it. We would rather have the "Monarch" than any other soft-mud machine we have seen. It makes good square brick from stiffer and tougher clay than other machines we have seen, with little or no wear no leaking or mud as on other machines. It is so simple in construction that it requires no expert to operate it.

As to the sander, we will say that it can not be beat. Where you want to make brick with a smooth face, the sand can be used dry as powder and it will not leak, therefore, not requiring a man to shovel back sand as on many other machines of its kind. We believe that this outfit with good care will last us for 50 years, as there is nothing to wear out except the knives.

Wishing you success, we remain,

Yours respectfully,

P. E. Anderson + Sons



We have the Best and Lowest Priced

Mold-Sander.

* * *

No one else makes . . . .

BALL-BEARING TRUCKS and BARROWS.

The Greatest Improvement in small articles ever put upon a brickyard.

* * *

ALL OTHER AUXILIARY TOOLS, MACHINES AND SUPPLIES.

The Wellington Machine Co.,

Send for Circular. Mention the Clay-Worker *WELLINGTON, OHIO.*

THE MAYOR OF PHILADELPHIA SENDS GREETING TO THE CLAY-WORKER AND CLAYWORKERS.

MILD SPRING-LIKE weather, with an occasional fog, has wrought destruction in the well-being of our citizens, and "la grippe," well named for its tenacious hold, is still the reigning terror, although a heavy fall of snow may be the means of wiping out this new found zymotic.

I regret in this connection to have to report the almost sudden demise of Samuel R. Huhn, at the early age of 48 years, due to pneumonia. He was the son of J. R. Huhn, one of Philadelphia's oldest and best known brickmakers, having started in 1857, and owning at one time a plant at 3rd and Poplar, now entirely built up with good, substantial residences.

The plant was afterwards transferred to 33rd and Dickinson, and in 1883 was taken charge of by the deceased, who had previously served two terms as a member of the Legislature for the Seventh District. During the erection of the general post-office here, between 1876 and 1880, the Huhns came in for a large share of the contracts, making successive deliveries of over eleven million brick.

The funeral took place at 10 o'clock on the morning of the 1st from his late residence, 1639 Girard avenue, being attended by representatives of the Master Builders' Exchange, the Volunteer Firemen's Association, the 30th Republican Club, some of the local builders, and members of the N. B. M. A., including T. B. McAvoy, Frank McAvoy, Charles Young, Charles Murtha, Peter Carroll, Webster & Nephew and others, the interment taking place at Mount Moriah.

—Murtha & Early.—

Mentally shaking hands with Murtha & Early over the 'phones, I learn that the output for the past season was good, all things considered.

This end of the 'phone—"How's that? About the same as last year? What was last year's output?"

That end of the 'phone—"Between fourteen and fifteen million."

My end—'"Considering the satisfactory condition, then, we may fully expect to see Mr. Murtha at the next Convention in Columbus?"

Their end—"Well, I can't say for certain. Mr. Murtha is away at present, but I guess he'll be there."

"Thanks."

"Same to you and the Clay-Worker."

—Thomas Flood.—

My voice reverberated through the open kilns and lost itself in the woods of Nicetown Lane. No answer, and again I walked and yelled, but the yard was full of vacancies. Every man Jack was taking a vacation and had been for some time, but soon the yard will take up new energy and fresh, hard muscle, and dear, sweet bread-and-sleep-making labor will cause the hum of many voices to take the place of this awful stillness; not now, however. I will tell you more later on.

Tramping over the fields, I was welcomed with a sturdy hand-shake and the aroma of a good cigar at the office of

—Joseph C. Siner & Sons.—

C. B., junior, in response to my question as to conditions said: "I don't think we can complain. I'm looking after this yard, and we have managed to get out about three and one-half million for the year; have just got through burning a kiln of hard for immediate delivery, and have only a few salmon left over. The outlook for 1899 seems bright (so did he), and there will be a call for salmon.

"Here, of course, we dry by natural means. Over in the other yard at Harrowgate, where my father is, hot air is the agent, and he managed to get out about six or seven million last year. He won't close down until January, and then only to make a few repairs. Say! I'd like to go to that Convention. I guess a fellow would have a pretty good time. My uncle and Tom Flood used to go, and I've heard them talk of some pretty good times." As I boarded the car his outstretched hand made the connection, and I heard, "Come and see us in the spring, meanwhile remember us to all the clayworkers."

One of the pleasures I indulged in on the second Christmas day, Monday the 26th, was that of being an eye-witness to a jolly feast given on the main floor of the Philadelphia Bourse by one of our enterprising evening newspapers to all boys of this city selling that paper.

Two thousand four hundred and seventy boys, ranging in years from five to sixteen, sat down to a good turkey dinner, topped off with pie, ice cream and candy.

Such a clatter; but nearly 5,000 bright eyes reflected with pleasure as the mouths worked in unison with the knives and forks, and his Honor, the Mayor of Philadelphia, roared out his greetings, and wished them all a Merry Christmas. Approaching him, I tendered the season's greetings from the Clay-Worker and the clayworkers in general. After expressing his thanks

—The Mayor Sends His Greetings to the Clayworkers.—

"Say to the Clay-Worker, I wish it a happy and continued success, and may the Clay-Worker be the means of teaching the public of America art."

—Frank McAvoy—

and his father, T. B., are back from Colorado Springs, both in splendid physical condition. Frank with seventeen pounds more flesh than he carried in the winter, and as jubilant as a boy. 'Cause why?

Two more Bushong kilns are to be erected at Perkiomen Junction. Frank Toomey is sending up a Ledgerwood hoisting engine, and other new improvements, running up into $10,000; will make this plant the finest in the State. The past season has been good, and orders carried over calling for 4,000,000 to be delivered at an early period in this soft, coy young year.

Then there's those other things he's interested in. What are they?

Oh! I guess I'll have to tell you some other time, too near Convention time now.

By-the-by, have just received a notice from the Eastern Hydraulic Press Brick Company, through its genial manager, F. G. Middlekauff, that on and after Jan. 1 their offices, exhibits and salesrooms will be located at the southeast corner of Broad and Chestnut streets, in the Real Estate Trust Building. He has extended a very cordial invitation for me to visit them, but until I have learned something of the topography of the places, as to where the matches are kept and which side the glasses are on, I don't contemplate a very long visit.

Mr. Middlekauff tells me they have not only doubled the capacity of their works during the year, but have been manufacturing night and day, and expect to do so right through the winter.

—Mr. Isaac Matson—

Sends greetings to all. He is just so anxious to get off to the Convention that when his son George got a slight touch of the "grippe," just after Christmas, the first question he put to the doctor was, "Will that boy of mine be well again by the end of January?"

At present the outlook is for fifteen or twenty Philadelphia men being present, and may good fellowship bring about business, one with the other, and good luck attend all during this, the new year. W. P. LOCKINTON.

IOWA AND NEBRASKA.

There will be a joint convention of the Iowa and Nebraska clayworkers at Sioux City, March 1 and 2. An interesting programme is being prepared and will be given in full in the February Clay-Worker.

HO FOR COLUMBUS.

For the Brickmakers' National Convention, at Columbus, Feb. 7 to 10, 1899, the favorite line from Cleveland, the Mahoning Valley, Western Reserve and northeastern Ohio generally, will be the Cleveland, Akron & Columbus Railway.

The service of this line between Cleveland, Akron and Columbus is thoroughly adequate to the needs of the traveler.

The morning train leaves Cleveland Union Station at 8:50 a. m., carrying a through parlor car, and the night train leaves Cleveland Union Station at 7:40 p. m., carrying a special sleeper between Cleveland and Columbus, in which passengers are allowed to remain undisturbed until 7 a. m., the car being set aside at the west end of the Union Station at Columbus. Special attention is called to this feature.

There is no similar accommodation between Cleveland and Columbus, and the delegates to the Convention will undoubtedly prefer to travel at night in this manner. Full information in relation to this service and the rates available for the Convention may be obtained upon addressing C. F. Daly, General Passenger Agent, No. 945 Society for Savings Building, Cleveland, O.

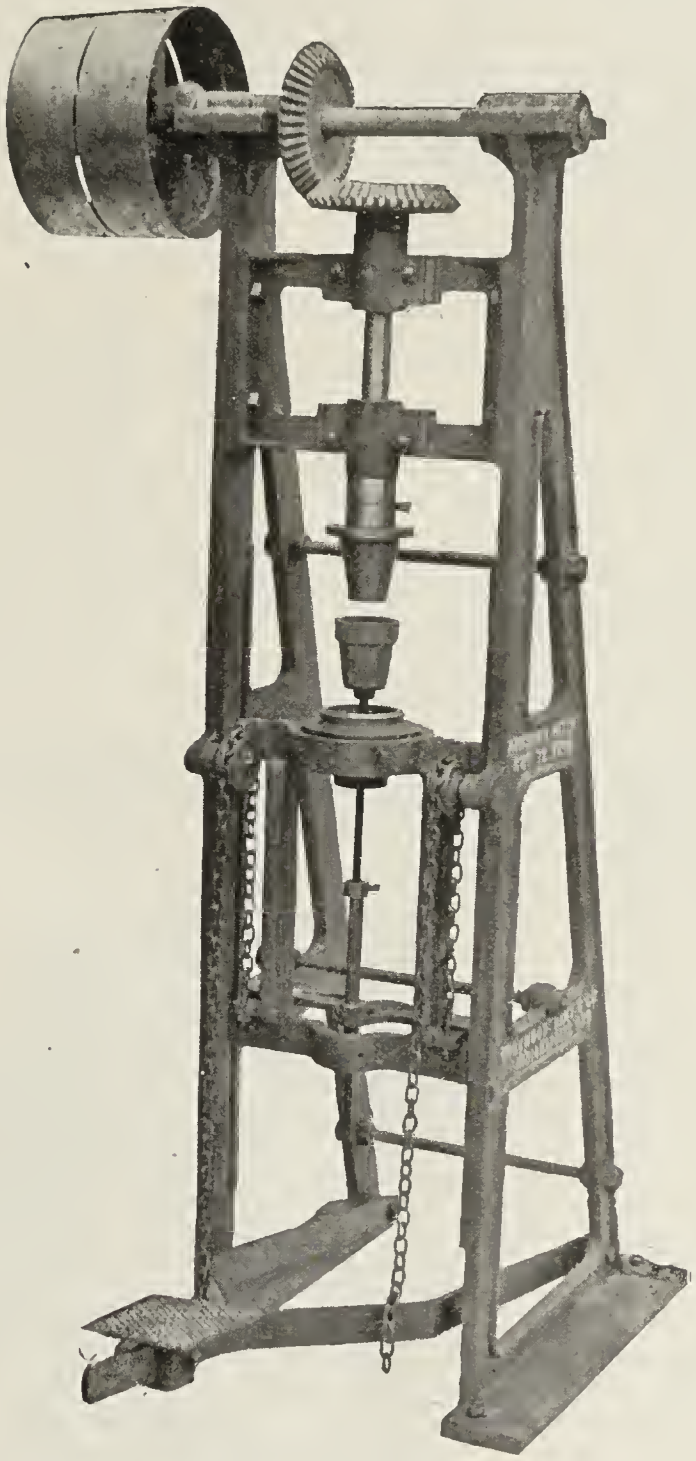
THE ONLY SUCCESSFUL

FLOWER POT MACHINE.

(PATENTED.)

Capacity in Ten Hours:

6,000,	2 inch Pots.
4,500,	3 " "
3,500,	4 " "
2,500,	5 " "
2,000,	6 " "
1,500,	7 " "



Makes Better and Cheaper Pots than can be Made by Hand. Does not Require Expert Workmen.

Write for Circulars and Prices.

The Rockwood Mfg. Co.,

No. 332 South Pennsylvania St. *INDIANAPOLIS, IND., U. S. A.*

THE NEW YORK MARKET.

WHEN THESE LINES APPEAR in the Clay-Worker 1898 will be numbered with the past, and, to judge by the reports from the different sections of this broad land, the brickmaking industry has felt a decided reaction from the low rates of the past few years, when, in many cases, no profit was in sight. Where there is no returning interest there is sure to be a loss. The tide-water yards have no cause to complain that the rates have not been remunerative. The profit has been a fair one, and at times the price of pale brick was as high as the hard were during the summer of 1897.

—The Tide Has Turned.—

"For a few years" the trade will be one that will pay returns on the investment. Small things in all lines of trade make great changes, and certainly the outlook in the beginning of the season was not of an encouraging nature. There were more yards in operation than the year before, and the price was falling. Then came wet weather and loss of green brick. When the weather settled it was a push by all to get the first kiln in market. Then, like a clap of thunder out of a clear sky, came the report of the strike on the yards at Haverstraw. All were willing to admit that it would be of short duration. The demand of the men, if acceded to, would only tend to help the trade by reducing the number made, and at that early date it was manifest that the market was overstocked, and, with good weather, it would require a microscope to see the prices.

—The Strike and Its Effects.—

The concession to the demand of the men by one yard had scarcely been discussed by the bosses when the men made a further demand, which led to a strike far beyond the expectations of all, and though not successful on the part of the men, it was of great benefit to the bosses. The change from a buyer's market to a seller's was soon apparent, as the shipment from forty or more yards was taken off the market entirely.

If foresight, or knowledge, or some judgment had been used by the maufacturers at that time, the price for the summer months would have ruled much higher. But it was a case of every one for themselves, as the market was taking stock as fast as it came in, and the close of the strike would release all the yards in Haverstraw, and the market would fall. I will ship and take what is going and the prices from week to week showed that although the market was in the hands of the brickmaker, he, as many times in the past, would not listen to advice to hold back, but send his vessel to market as fast as she was unloaded, and the market would feel the arrival of a large tow from Up River or Newburg Bay, and the buyer would hold off for a day, and help one another by taking stock off of one of the other boats, and the market would show a drop of twelve and a half cents or, in some cases, a quarter per 1,000, when the market was the seller's all the time with any foresight used by him.

Concerted action could never have achieved the reduction in output that the strike did the past summer. If they had all agreed to curtail there would be those who would not be expected to keep their word, as in duty bound they should, but instead rush the stock on the market in the expectation that the rates would advance, and would result in all giving in and freer shipment, and the others would get left. There is no imagination in this; it has been done before and by those who one would think would have some respect for their word.

—The Unexpected —

Continuation of the strike for over two months, and the consequent holding of the many millions that would otherwise have been placed before the dealers in New York should be a lesson that every one connected with the manufacture of brick should study well. Why? Simply because it furnished facts that no one could have pursuaded the manufacturer existed. One of the facts certainly was that the market could get along without the full production. One year ago, if any one should have said that in 1898 the largest producer of common brick would be off the market for the length of time that followed the strike, the cry would have been from all, Why, there will not be stock enough to keep the builders going, and the prices will be way up. The result of 1898 stands before them and controverts any argument that they could bring against it. The market did not suffer, and the prices were nothing fancy, and facts are stubborn things to get around. Without them, as set forth the past season, you could not have convinced the many—as I have reason to believe that there are some in the trade who do give the matter due consideration, but what can they do when others will not see the facts that are prominently before them; yes, and touch their pockets from year to year.

Waiting, still waiting, for the return of the old prices and demand with the return of "good times," then we will be all right. Yes, like the virgins who did not provide their lamps with oil, since the good times they tell about, not in '69, but still later, when seven and eight dollars per 1,000 ruled. A new factor has come in which must be considered, and that is the skeleton frame, not to mention other materials which largely take the place of brick.

—Knowledge—

Is power, but a knowledge of one's business should be broader than just the limited confines of the brick yard. The manufacturer should study all the points of consumption, and compare with the past; learn why the use of brick is curtailed—and I will say at this point that the tide-water manufacturers have two objective points when they go to New York city, the one 52d street, to see his agent: the other, go on 'Change down town in Courtland street. When there, if he will only take a few minutes and walk up to Broadway and look up and down that street, he will see prominently before him a class of buildings that should set his thinking faculties hard to work. Within the range of his vision some of the tallest, and one of the tallest buildings in the world, thirty stories in heighth, is in view, should be an object lesson to inform himself as to all that is connected with the trade, and see if he, although a manufacturer in a small way, cannot help along the trade by some means that his knowledge would show to all would be profitable.

—Centralization—

Of capital is taking place so rapidly in this country that long-talked-of consolidation of the brickyards which are feeders to New York market may become an established fact. If it ever does it will be by men outside of those who are now making brick. If Gabriel came down and showed them how they could improve their condition, they would think that some one else would probably do better and refuse to sell. They do not seem to consider that all the moneyed institutions are reducing interest rates from the loans of money; all large loans are floated at low rate. Capitalists will take chances for larger incomes from trade, and why not the brick trade?

—The Brick Market—

Is holding its own, and there is no reason why manufacturers should not realize a fair price from now till new brick shipment from along tidewater begins. The ice king up to the present time has not entirely shut off all communication.

—$5.50, $5.75 and $6.00; pale, $3.50 and $4.00.—

Hackensack may be classed with the top quoted rates; as usual, the demand carries the price of all along.

Hackensack, Jan. 2, 1899. A. N. OLDTIMER.

FROM INDIANAPOLIS THE SERVICE OF THE **Pennsylvania Lines** Is the Best.

FIVE DAILY THROUGH TRAINS AS FOLLOWS:

Leave	Indianapolis,	5:50 a. m.	Arrive	Columbus,	11:30 Noon.
"	"	8:25 a. m.	"	"	12:50 p. m.
"	"	2:30 p. m.	"	"	7:35 p. m.
"	"	5:00 p. m.	"	"	11:40 p. m.
"	"	7:10 p. m.	"	"	12:05 a. m.

W. W. RICHARDSON, D. P. A.

FARE ON THE CERTIFICATE PLAN

$7.15

....FOR THE ROUND TRIP.

Ho! For Columbus!

The Chicago Delegation Invites Company.

SPECIAL ACCOMMODATIONS VIA THE

Pennsylvania Lines.

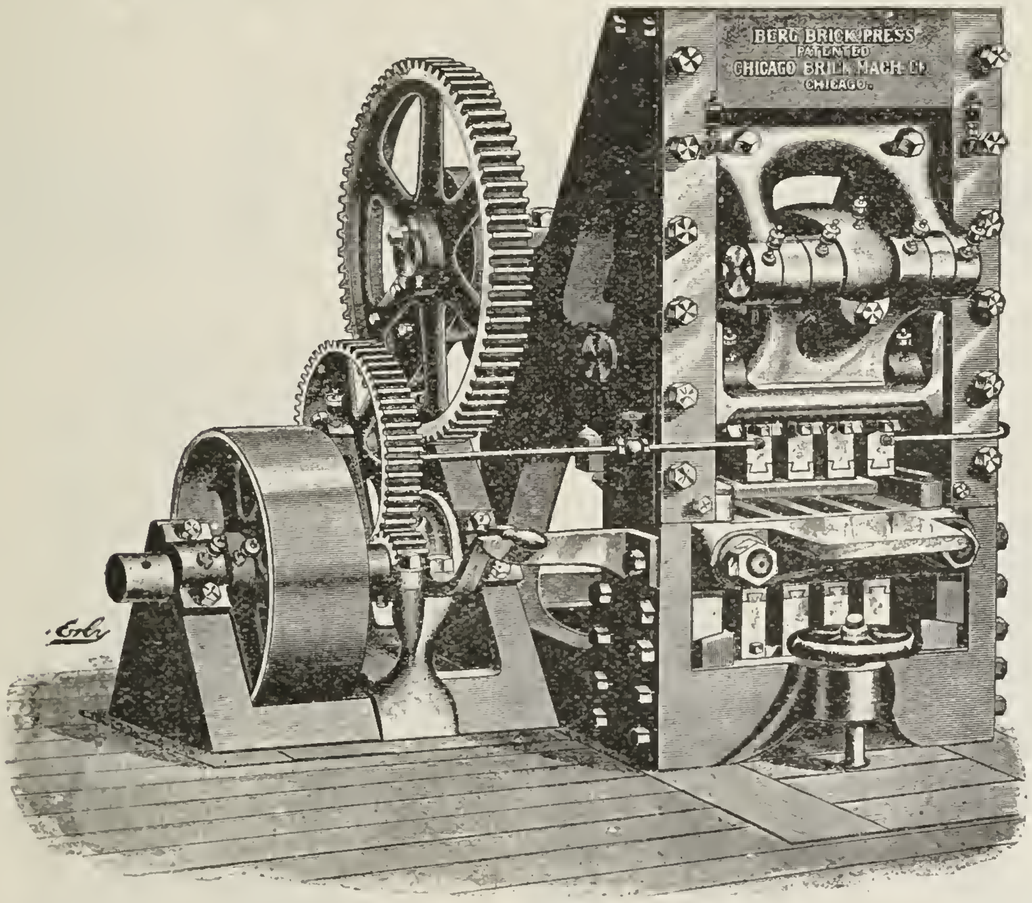
THE Chicago Delegation to the coming **N. B. M. A. Convention**, at Columbus, will leave the Union Station, Canal and Adams Sts., Chicago, Monday, February 6th, at 8:15 p. m. arriving at Columbus, 7:30 next morning via Pennsylvania Lines. A rate of one fare and one-third

$11.15

On the certificate plan has been arranged for. Special Pullman sleeping car will be provided for the delegates. Brickmakers from out of town points are invited to join the Chicago party. For sleeping car berths, write at once to

H. R. DERING, A. G. P. A., Pennsylvania Lines, **Chicago.**

See that your Tickets read via PENNSYLVANIA LINES.



Up-to-Date Machinery.

OUR **BERG BRICK PRESS** is the Most Modern in design and construction of all Dry Press Machines. Simplest, Strongest and most Durable.

It has three distinct pressures and an unequalled Mold Box. Absolutely unbreakable and fully guaranteed. Circular on application.

Our line of **Stiff Clay** and **Soft Clay Machinery** is also strictly **Up-to-Date.** All the latest improvements and most convenient devices.

Send for new 1899 catalogues.

CHICAGO BRICK MACHINERY CO.,
225 DEARBORN STREET.

ST. LOUIS NOTES.

THE depressing effect of the weather has no doubt had its effect on business of the month, and the year starts out poorly. The hope of the brickmaker is that the old adage may be verified, and a good ending may be made of a bad beginning.

The block on the southwest corner of 7th and Oliver streets has been torn down, and the contract has been let for a four-story building to be occupied by the St. Louis Republic. The exterior will be stone, with terra cotta cornices. The construction will be such as to permit the addition of other stories, when occasion demands.

Foundations are going in for large buildings on 11th and Washington ave. The contract for the superstructure has not been let.

The Superior Press Brick Co. secured the contract for one and a quarter million of brick for the addition to the St. Louis University.

The Hamilton-Brown Shoe Co. has recently bought a block of ground in South St. Louis upon which they will erect, at once, a large shoe factory. The location is central to a large class of industrious people, who will find employment within the walls. It is proposed to build it on the slow-combustion plan, and provide reading rooms, wash rooms and possibly a gymnasium. When completed, 1,200 people will be employed.

The patent continuous kiln built in the Union Press Brick Works yard is not working as satisfactory as it was hoped for.

Several lettings have been made of paving brick contracts, and more are to follow. The Neidringhaus plant does not seem to be turning out a very good brick. Reports state that on the contract for paving Hamilton avenue 40 per cent. were rejected. This is a very large proportion, and when the rejected brick exceed 10 per cent. it is fair to presume that inferior brick will go in, and the inspection will not be as rigid as it might and should be. One inferior paving contract will do more harm than can be remedied in a year. A number of the last batch of contracts were awarded to Alex. Neidringhaus. Maybe he will be able to use more of his own brick than a regular paving contractor. It is generally conceded that Neidringhaus has a "pull," but from the Hamilton avenue incident the traces must have been weak. Several St. Louis people were made glad by the receipt of a dividend check of the Purington Paving Brick Co., of Galesburg, Ill., on Jan. 3. That company is now supplying about 75 per cent. of the paving brick used in St. Louis, and no "kicks." Make it 100 per cent. D. V., and don't let the macadam and asphalt people supplant the use of paving brick in St. Louis on account of poor material.

The world's fair to commemorate the Louisiana purchase has been inaugurated with a great flourish, and is to be held in 1903. Real estate men are rubbing their hands in every corner, and a repetition of Chicago prices during the last world's fair in that city is flitting through the minds of the St. Louis brickmakers. There is a great deal of difference between a banquet at which it is decided to hold a world's fair and getting together 5,000,000 of St. Louis dollars. There are several times 5,000,000 dollars to be had in St. Louis, but 4,999,000 have been pounded down with a pile driver and held in place with a mountain of conservatism. If you can move that mountain you get the money, and the world's fair will be a success.

The recent trial of Walter Grath's new patent coking furnace is reported to have been so successful that he has received several applications from Illinois and Iowa for the right to use it.

The papers to-night record the death of architect W. M. Bulkly, of the firm of L. C. & W. M. Bulky. He was one of our brightest young men, and a rising architect. He was essentially the friend of the clayworkers, as evidenced by his works. While reserved to a marked degree, those who have gained but a slight acquaintance could not fail to observe his sterling integrity, rapidity with which he grasped new ideas and his ever ready disposition to follow the golden rule.

Plans for the new Bell telephone station have just been completed by the firm above mentioned, and a new departure will be introduced in the shape of salt-glazed brick for inside of building. The samples were submitted by Evans & Howard through the architect, and approved of. They have also been largely used in the basements of the new school buildings, Saint Vincent Asylum and other places. The Evans & Howard Co. are improving their brick and terra cotta factory by the addition of new machinery, a 300-horse-power engine, and making changes in their yard and shipping facilities, which will secure a larger output at less cost. A. SAINT.

A GOOD PLACE FOR A BRICK PLANT.

Editor of The Clay-Worker:

Sometime, when brick and tile manufacturers, potters or other workers in clay are prospecting for clay beds for profitable development, my prediction is that they will find what they want at Lagrange, Fayette county, Tennessee.

That place is fifty miles east of Memphis, and has a railroad outlet north, east south and west. The clay in that locality has been analyzed as follows:

Moisture at white heat	8.27
Silica	62.47
Oxide of iron	2.05
Alkalies	2.85
Oxide of aluminum	22.06
Oxide of calcium	.02
Oxide of magnesium	Trace.

The place seems to me to offer splendid openings for manufactures. Land can be leased or purchased at low prices, having been worn out for farming purposes. The clay can be obtained from the surface. Wood can be had at $2 a cord delivered, and wages are from fifty cents to one dollar a day.

Respectfully,

Somerville, Tenneessee. L. VIAJERO.

A BARGAIN COUNTER.

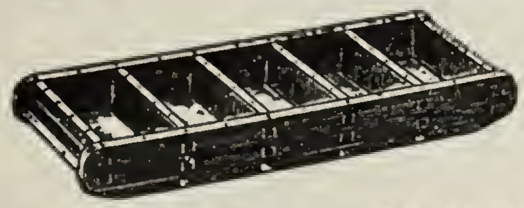
For cheap machinery the reader is referred to our For Sale Columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear machinery in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the "Wanted, For Sale, etc." columns a means of satisfying their needs.

HELD IN RESERVE.

PHILANTHROPIST—"And have you anything laid by for a rainy day?"
PAT DUCY—"A whole quart, sor; an' it's a glorious drunk Oi'll hov th' foorst day it's too wet to worruk."

ZIM IN Judge.

G. COLDEWE & CO.,



MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE **MOULDS**

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

FOR SALE CHEAP.

A Good Dry Press Brick Machine, in good running order, will be sold for less than half first cost. Its all right and a bargain. Have changed to Stiff Clay Process. Address

"SECOND HAND,"
1 tf d **care Clay-Worker.**

Anglo-American Pottery.

Old English China with American Views.

A MANUAL FOR COLLECTORS, BY

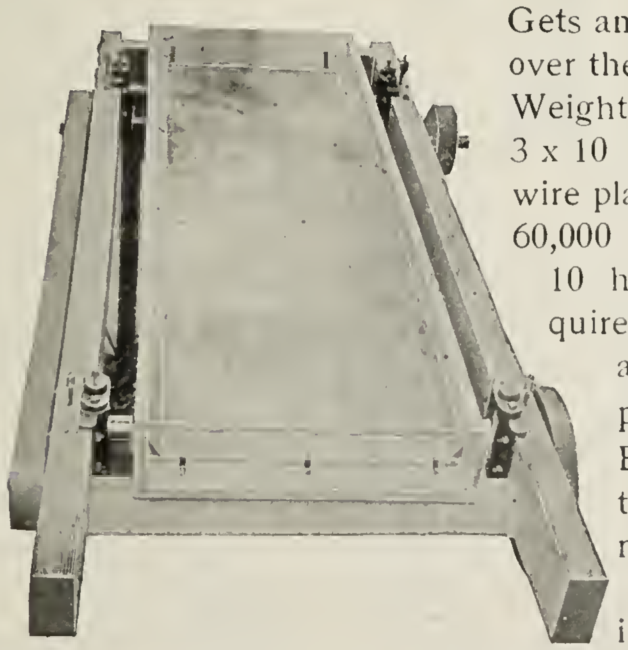
EDWIN A. BARBER, A. M., Ph. D.

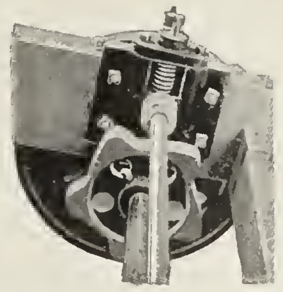
Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc., and Honorary Curator of the Department of American Pottery and Porcelain, Pennsylvania Museum and School of Industrial Art, Philadelphia.

The edition will be limited to 1,000 copies. Price, $1.50 per copy; by mail, 10 cents extra; by express, at the expense of the person ordering. Remittances should be made by Draft or Check, Postal or Express Money Order, to

T. A. RANDALL & CO.,
The Clay-Worker.
INDIANAPOLIS, IND.

The Eureka Screen





Gets an impulse at each corner—vibrates over the whole plate, on the plate only. Weight, 1,500 pounds; 5 x 14 feet over all, 3 x 10 feet screening area, ⅛-inch mesh wire plate. Screens for 60,000 brick per day of 10 hours. Will require the minimum of attention or repairs. Cost, F. O. B. cars, Shoustown, Pa., $150. Work, fittings and material guaranteed.

The only screen in the world screening 100 mesh Manganese.

REFERENCE: Booth & Flinn, Pittsburg, Pa.; Kendall & Flick, Elkton, Va.

CATALOGUE.
[Mention the Clay-Worker.]

CRESENT MFG. CO., Box 8, Shoustown, Pa.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED—To buy second-hand machine and cutting table suitable for the manufacture of hollow partition block. Address,
1 1 d "N. H." care Clay-Worker.

FOR SALE—No. 5 Brewer Tile Machine; in good order. Tile dies 3 to 10 inches. Side cut brick die. Very cheap.
1 3 e WM. STARE, Mendota, Ill.

WANTED—Position as foreman and burner of brick works. 22 years experience and a hustler. Best of reference. Address,
1 1 em BOX 927, care Clay-Worker.

FOR SALE — 150,000 new and second-handed pine pallets, 32 and 34 inches long, ten wide.
J. F. STENGEL,
1 6 c Ellicott Square, Buffalo, N.Y.

WANTED—Situation as foreman of building brick yard. Many yards of experience. A good burner, industrious and reliable. Address
1 1 d GRAY, care Clay-Worker.

WANTED—Position as superintendent or manager of paving or building brick plant. Twenty years practical experience in making and burning brick. Best of references. Address,
1 1 em "B. M." care Clay-Worker.

POSITION WANTED — By experienced man as manager. Fire, paving, building, common and other brick and tile, sewer pipe, etc. Can take charge of plant. Address
1 1 c F. W., care Clay-Worker.

WANTED — Position as superintendent. Chambers Bros. machine preferred. Ten years' experience. Salary moderate to commence THOMAS, care Clay-Worker.
1 1 dm

WANTED — Position by experienced burner of both dry press and paving brick. Can burn in either up or down-draft kiln. Best of references as to ability. Address
1 1 dm RANKIN, care Clay-Worker.

FOR SALE—GREAT BARGAIN—Henry Martin "A" Brick Machine, capacity 30,000, very good order; pug mill, crusher, elevator, shafting, etc, $750. All in first-class working order. Good 30 horse power Erie engine and boiler, $400.
1 tf dm BOX 13, care Clay-Worker.

FOR SALE—A steam brick plant. Good location, capacity 20,000 to 30,000 per day. Will sell all or one-half interest in same. Present owner engaged in other business. Address
CLAY CITY BRICK CO.,
1 2 dm Clay City, Ind.

FOR SALE—A number of Brick Presses formerly belonging to the Anderson Pressed Brick Company, Chicago, are for sale. Three have a capacity of 12,000 each, and two of 5,500 each.
S. M. MILLARD, Room 1110,
1 1 dm No. 100 Washington St., Chicago.

CRUCIBLES, BOTTLES AND RETORTS FOR THE CHEMICAL INDUSTRY, FIRE CLAY WARES and **EARTHENWARE FOR TECHNOLOGICAL PURPOSES. AGENCY or BUSINESS CONNECTIONS WANTED,** by a best recommended Engineering Bureau for Russia. Offers with price, catalogues, prospectus, notes referring time required for delivery and other conditions. Address "S. M."
1 1 c care Clay-Worker.

WANTED.

A Sword brick machine, largest size. Brewer make preferred, with Brewer off-bearing table. Also a Double Die Steam Repress, capacity 20,000 per day. Unless machinery is in good condition and up-to-date, don't write.

Send cuts, description and prices, also size of moulds, to "SPOT CASH,"
1 1 d care Clay-Worker.

(Continued on Page 70.)

AMONG THE CLAYWORKERS OF JERSEY.

IN JERSEY we find all factories running full time, except the old Perth Amboy Terra Cotta Works. This plant, after being pretty busy during the summer, is now almost idle. The new terra cotta works across the Sound, at Tattenville, have several jobs on hand, so we are told, and by the way, I am informed that one of the former pupils of Prof. Orton's school, and a son of my fellow townsman, Augustine Campbell, is now filling a position at this new plant. As yet I have been unable to visit these works, so cannot give you much of an idea of their capacity. On the Amboy side, the Standard Terra Cotta Co. is quite busy. Many improvements have been made at this plant during the past year, showing prosperity which we are glad to note. The Pardee Works are making quite a run on hollow brick, but nothing in the way of tile, sewer pipe or fire brick. Further up we came to the Standard Fire Proofing Co.'s plant, now under the management of Robt. Lyle, formerly with the Staten Island Terra Cotta Lumber Co. To say that this establishment is doing business is putting it mild. Mr. Lyle has now been at the helm for about two years, and if you were ever at the plant before that time and come back now you will surely have to get a guide to take you through all the buildings or else make up your mind you are a lost editor. This plant now consists of forty kilns, immense buildings, and the fourth sewer pipe press is just being placed. These presses are all being run now on an electric subway contract. Some of this material I believe goes to your own city, while a large portion goes to New Orleans. I desire shortly to give you a full history of this plant, so will say nothing more about it at present.

At Keasbey's the wheels are running as usual under the efficient supervision of Mr. J. C. Rossie. Many improvements are noticeable around this plant; also, I notice all of the old hands at this plant stick to their jobs, and many are growing gray in the service. Quite heavy shipments have been made of hollow brick and fireproofing lately, but now the yards are filling up again. As the town of Keasbey is outside of the city of Perth Amboy and in Woodbridge township, it was found last fall that the old school building was entirely too small to accomodate the fast increasing product of children, so a new building was planned. It is located on the high ground above the Raritan river, and has a commanding view. The material is of mottled eight-inch brick, donated by the Keasbey or Raritan Hollow and Porous Brick Co. The design is a two-story building and contains four rooms, with all modern improvement for heating and ventilation. These brick are of a beautiful shade, and are a credit to the manufacturers.

The Adam Weber works are now run by the Adam Weber Co., Mr. Adam Weber having retired from active business. As this factory runs exclusively upon fire brick and gas retorts, there is not much change from month to month. Red brick have brought good prices this last season, with fair outlook for the coming season.

In the city of Perth Amboy the first block of brick paving was laid last fall at the Ferry landing, Smith street, which is quite steep, and was formerly paved with macadam, but heavy rains made repairs necessary too often, so the city fathers concluded to try brick, and, as usual, the shale fellow got in his little oar in the specifications. The work has been completed, but as yet your scribe has not seen it. We hope it is a good job, as Perth Amboy needs many square yards of brick pavements.

At New Brunswick we note a pile of brick on Higland Park hill to be used for paving. These brick are end-cut brick without being repressed, and at a trial of several of them I noticed a lack of good tough material, as by snapping a couple together gently the spalls fly very freely. We do not know what make they are, but fear the brick paving in that city will get a black eye from the use of these brick, as the grade is heavy and a heavy traffic is constantly passing over the road. The only good thing about this pavement will be the foundation. This will be on solid shale, and cannot give way. I note in many Clay-Worker letters the very question we brought up years ago about poor brick in places condemning brick pavements, now cropping to the surface. Why will parties invest so much money in a plant and then neglect the very first thing necessary to the life of these plants, viz.: sending out poor brick where they should be the best? I mean to keep a watchful eye on these beginnings and keep you posted on results.

Perth Amboy has not had quite as many dwellings erected the past year, but to make up in value, the Raritan Copper Works Co. is erecting a plant at a cost of about $1,000,000 that will be quite a spoke in the wheel. These buildings are of brick, and a brick stack 185 high has already been finished. This plant is on the old John R. Watson estate, immediately on the Rariton River and Central Railroad of New Jersey. A spur of the Lehigh Valley will also be run across the city to supply them with coal.

The prime movers in this venture are the Lewiston Bros., very wealthy copper refiners. Mr. McCoy is the manager, and the latter gentleman, with the former, have applied for the right to place an electric passenger railroad in some of the principal streets of the city, furnishing the power form their own extensive plant used in the refinery. The franchise has not been given yet, but as they have offered to come to the terms of the city councilmen, it is a doughnut to nothing they will get the right to lay tracks.

All the clay dealers in Woodbridge, on the east, are so proud of the improvements made there last year that an ordinary person can hardly pass them now. Street sewers, water works and electric lights, all in one year, is something to be proud of we must admit. The water comes from wells northeast of this town, supplying Metuchen, Woodbridge and Carteret. Woodbridge's electric lights comes from Rahway, five miles to the north, and consist of twenty-four-candle-power lights about every 300 feet throughout the town, and Col. Ross Valentine, with whom your scribe happened to be riding when we first noticed the improvement, tells me they are preferable to the large lights used in Amboy, as it makes a better light to drive by. Mr. C. W. Boynton, Sr., is the head of the Union & Middlesex Electric Railway, running from Rahway to Boynton Beach. This company also furnishes the lights spoken of. Mr. Boynton has for many years been a manufacturer of drain tile and hollow brick. His factory is just north of Henry Maurer & Sons. We look for a vast improvement in building during 1899, as everthing points that way. The shipments of wheat and other grain from the Lehigh Valley docks at Perth Amboy amount to six million bushels per month. This makes work for an army of men. Coal shipments are also very heavy. On the whole this corner of Jersey is in a fair way to prosper.

W. R. O.

NO KICKING DUE TO HIM.

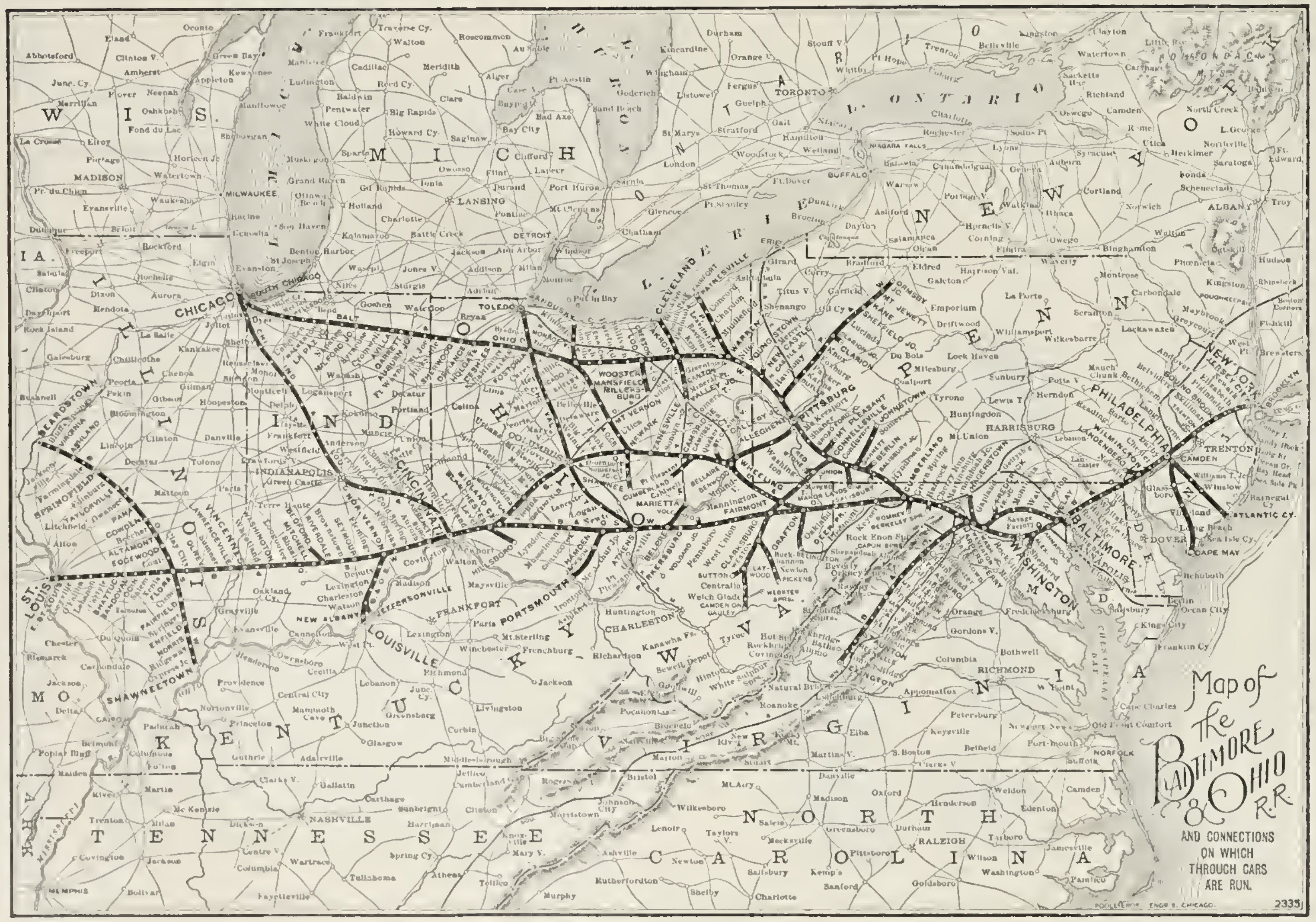
PIG—"What's the matter, Sportsy?"
DOG—"Oh, this is too much! to think of that fellow devouring my forefathers at the frankfurter-stand."
PIG—"Brace up; that's not half so bad as the humiliation I bear at seeing those college mugs kick my ancestors' hide all over the field."

All B. & O. Lines
Lead to Columbus.

Those who attend the **N. B. M. A. Convention** should remember that the

BALTIMORE & OHIO

Represent the finest Railroad Equipment in the World. If you want the Fastest and Finest accommodations see that your tickets read via B. & O. Railway.



Map of the Baltimore & Ohio R.R. and connections on which through cars are run.

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THROUGH SLEEPERS.

FAST TRAINS.

MAGNIFICENT PULLMAN EQUIPMENT.

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In C. P. A. Territory,

From all B. & O. Stations to the Columbus Convention.

* * *

D. B. MARTIN,
M. P. T, Baltimore.

B. N. AUSTIN,
G. P. A., Chicago.

BRICK PAVEMENTS IN CHICAGO AND ITS SUBURBS.

CUYLER is one of Chicago's suburbs, and just now the pavement of its streets is receiving a great deal of attention. Mr. Frank W. Moulton has given the subject a deal of attention, and gives expression to his opinions through the Cuyler Advocate, as follows:

—Brick Pavements.—

One of the chief questions to be decided in the near future by many of the residents of Cuyler, as well as by Chicagoans generally, is the choice of a street pavement which is durable, smooth, sanitary and reasonable in price. The "cheap and nasty," unsanitary and short-lived cedar block pavement is, in my opinion, not to be considered. I should also advise against the paving of city streets with macadam, which, when it is wet, is very, very wet, and consequently muddy, and when it is dry it is horrid, and blows away in clouds of dust, which fills the air, enters the houses, covers furniture and hangings, and in every way possible makes itself the everlasting bane of the poor housewife.

I live on a macadamized street, and know whereof I speak.

From my experience with and study of the paving question, I have arrived at the conclusion that, everything considered, a properly laid, repressed, vitrified brick pavement, on a six-inch concrete foundation, has no superior, and for the following reasons:

Such a pavement costs the property owner less than any other claiming the elements of durability, smoothness, ease of repair and sanitariness.

So far as durability is concerned brick is unexcelled. The high-class paving brick, which are not only pressed but repressed, are as dense as granite, and they will withstand even a greater crushing test than granite, as has been recently demonstrated. They are nonporous, and, unlike cedar blocks, they neither decay nor float. It is a satisfaction to a property owner to know that the pavement on his street will not, within a few years after it has been laid, be in continual need of repairs; and in pavements, as in other things, it is true that "the best is the cheapest."

A properly laid brick pavement is smooth, and it is not only smooth, but it affords an excellent foothold for horses. It is never slippery.

The sanitary feature of a pavement is an important one for the consideration of those who contemplate paving or the repaving of a street. To be thoroughly sanitary a pavement should be nonabsorbent, and it should at the same time offer no opportunities for the collection of dirt and filth. Brick are now laid with the interstices completely filled with a grouting which cements the bricks together, making the pavement of one solid piece from curb to curb.

A street thus paved may be flooded with impunity, as the water cannot reach the foundation, while, at the same time, the street can be thoroughly cleaned by sweeping, which will keep it wholly free of both mud and dust.

The laying of a good pavement on a poor and short-lived foundation would be equivalent to erecting a fine building on a foundation which continually needed repair, and which as continually threatened the existence of the superstructure.

Cuyler is fortunate in possessing a sandy soil, which in itself forms a fairly good foundation for a pavement, and which is without a superior as a foundation for a concrete foundation. In the laying of a cement concrete foundation, therefore, a saving of from 30 to 35 cents per square yard could be effected by using what is known as a natural cement. This in itself would be quite an item and one well worth considering where a good pavement for the least money is what is desired.

The interest shown by the residents of Cuyler in the improvement of their streets augurs well for the rapid growth of that section of the city. Well-paved streets invariably result in enhanced property values, and I have for a long time been of the opinion that the paving of a street, outside of the beauty and added conveniences which it brings, invariably and immediately adds to the value of the abutting realty at least the entire cost of the pavement. Houses rent more readily after a street is paved than before. The days of dust and mud become a part of the past, and the property-owning residents then wonder at their own long patience with a set of conditions which would seem to have been almost intolerable.

The PURINGTON PAVING BRICK CO.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

T. B. McAVOY, President.
FRANK B. McAVOY, Sec. and Treas.

McAvoy Vitrified Brick Co.,

of PHILADELPHIA, PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 Arch St., Philadelphia.
WORKS:—Perkiomen Junction, Penn.

The Des Moines Brick Manufacturing Co.,

MANUFACTURERS OF

Vitrified Paving Brick,

DES MOINES, IOWA,

Is operating a plant with a yearly capacity of Thirty Million Paving Brick, with unsurpassed shipping facilities

Estimates on Brick pavements cheerfully given.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

Correspondence solicited.

Office and Works: Clinton, Ind.

INDIANA PAVING BLOCK,

The Standard Shale Block for Street Paving.

Manufactured at Brazil, Ind., by the

Indiana Bermudez Asphalt Co.,

Main Office, 25 and 26 Baldwin Block,
INDIANAPOLIS, IND.

Prices and samples furnished on application to above address.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT,
COALDALE, ALA.
TELEGRAPH OFFICE,
WARRIOR, ALA.

BRANCH OFFICES,
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

J. L. HIGLEY & CO.,

CANTON, OHIO.

Four of the largest and best paving brick plants in the world.

Canton Paving Block,

Head the list for uniformity, finish and wearing qualities.

Samples sent free on application.

Write for prices.

FOR SALE — One (brand new) two-mold dry press, one four-mold dry press, one 9-foot dry pan. Cheap. Must sell. This is a bargain. G. PRESS-BRICK WORKS,
1 1 cm care Clay-Worker.

WANTED — Situation as superintendent or assistant by man who understands the making and burning of enamels, either in pottery or brick works. Address
1 1 c N. J., care Clay-Worker.

WANTED — Situation as superintendent or foreman of brick works; soft mud, stiff mud, up draft kiln; good references; 25 years experience; would make by the thousand. Address
12 2 cm MASS, care Clay-Worker.

FOR SALE, CHEAP — Second-hand auger brick machine of large capacity, and as good as new; a real bargain to anyone wanting a good stiff clay brick or tile machine. For price, etc., address
12 3 d "WIRE CUT," care Clay-Worker.

FOR SALE — One good second-hand Chambers machine, 25,000 daily capacity; write for particulars. Address
CHAMBERS BROS. Co.,
52d, below Lancaster, Philadelphia, Pa.
12 2 d

WANTED — A burner to take charge of my kilns; one who has had long experience in burning and glazing sewer pipe; must be well recommended and start in on trial; state where last engaged. Address
12 2 d SEWER PIPE, care Clay-Worker.

FOR SALE — Brick plant complete, on Ocmulgee river and Georgia & Alabama railroad at Abbeville, Ga. Address
1 2 dm H. O. SNOW,
Administrator estate Geo. W. Reed, Abbeville, Wilcox Co., Georgia.

WANTED — A practical mechanical engineer wants position in large plant. Fifteen years' experience with clayworking machinery. I can do any and all kinds of repairing. Good reference furnished. Address BLAKEY, care Clay-Worker.
1 1 cm.

WANTED — Position as superintendent by a man of experience, capable of taking entire charge of plant, paving, building, common, fire, sewer pipe, and other clay products; up or down-draft kilns. Best of reference. "B.," care Clay-Worker.
1 1 c

FOR SALE — A first-class brickyard and plant, latest improved machinery, large capacity, situated just outside city limits of Richmond, convenient in location, inexhaustible supply of clay; natural gas. Will be sold upon easy terms at a low price. For particulars address JESSE S. REEVES,
1 1 dm Richmond, Ind.

WANTED — A first-class man as superintendent or foreman of brick plant. One experienced in the manufacture of brick and tile and thoroughly understands the setting up and keeping in repair and running all kinds of brick machinery; also capable of handling gang of men. Address
1 1 d WEBSTER, care Clay-Worker.

FOR SALE — Dry-press outfit, consisting of three-mold Boyd, forty-two inch Steadman, elevator, screens, mixer, steamer and pulleys, all in good shape and nearly new. Can be put in operation for test. Price complete $1.500. Clay unsuitable. This is not a worn-out outfit.
THE DAYTON BRICK CO.,
1 1 pm Dayton, Ohio.

WANTED — In city of 45,000, reliable, practical brick man, to take an interest in and charge of first-class brick and tile plant. Excellently located, good transportation facilities, large demand for the product. Owner will make liberal terms and invest money if the right party is found. Address
1 1 cm C. H. DAY,
Secretary Dubuque Business Men's League,
Dubuque, Iowa.

AN ENGINEERING BUREAU IN RUSSIA with finest references specially skilled in the clay industries, wishes to enter in business relations with high-class manufacturers of all kinds of machinery used in connection with the working and drying of clays. Replies, with illustrated catalogues and prospectus, time required for delivery, price and other conditions.
1 1 c M. S., care Clay-Worker.

BRICK

BRICK CARS and TRUCKS

Of Any and All Kinds.

Easy Running. Light yet Strong.

Don't fail to get our prices. Catalogue free.

THE ATLAS BOLT & SCREW CO.,
Cleveland, Ohio.

CARS

"LEVIATHAN."

"Upon Earth There is not His Like.'

....Sept ....1896.

MAIN BELTING CO.,
55 and 57 Market St., Chicago, Ill.

GENTLEMEN:—Please ship us via freight, 146 feet x 18" 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "**LEVIATHAN.**" Prompt shipment of the above will oblige. Yours very truly,

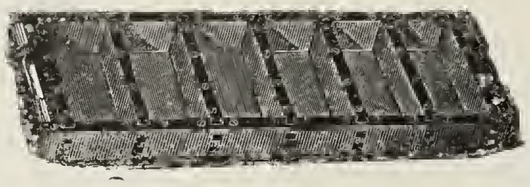
....

Manufactured under Special Process.
A Guarantee of Superiority.

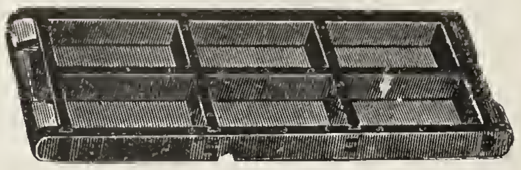
NOTE.—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

MAIN BELTING COMPANY,
Sole Manufacturers LEVIATHAN BELTING,
55 and 57 Market St., CHICAGO, ILL.
PHILADELPHIA: 1219 Carpenter Street. BOSTON 120 Pearl Street.

1899--BRICKYARD SUPPLIES--1899



6 Brick Machine Mold.



6 Brick Hand Mold

3 Brick Hand Mold.

NOW Is a good time to look over your stock and see what you will need for the coming season.

Send your orders to "Arnold's" for what you need. You can send the order now and we will have them ready to ship at the time you want them.

You will be sure to get the best there is made and if you want anything special in the line of Moulds, Trucks or Barrows of different designs you can get it made to order here at reasonable prices.

Moulds, Trucks and Barrows a Specialty.

D. J. C. ARNOLD, New London, Ohio.

MENTION THE CLAY-WORKER,
WHEN WRITING TO ADVERTISERS,
MENTION THE CLAY-WORKER.

Do Not Make Dry Press Brick

..... WITHOUT .....

The Carmichael CLAY STEAMER.

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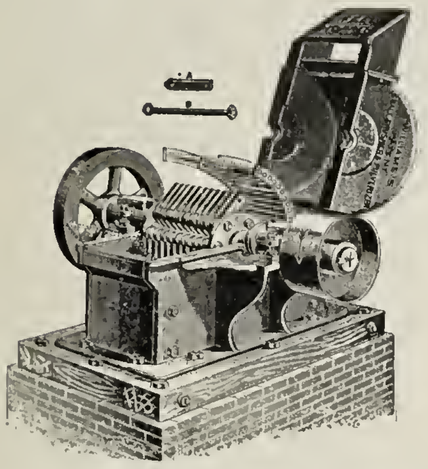

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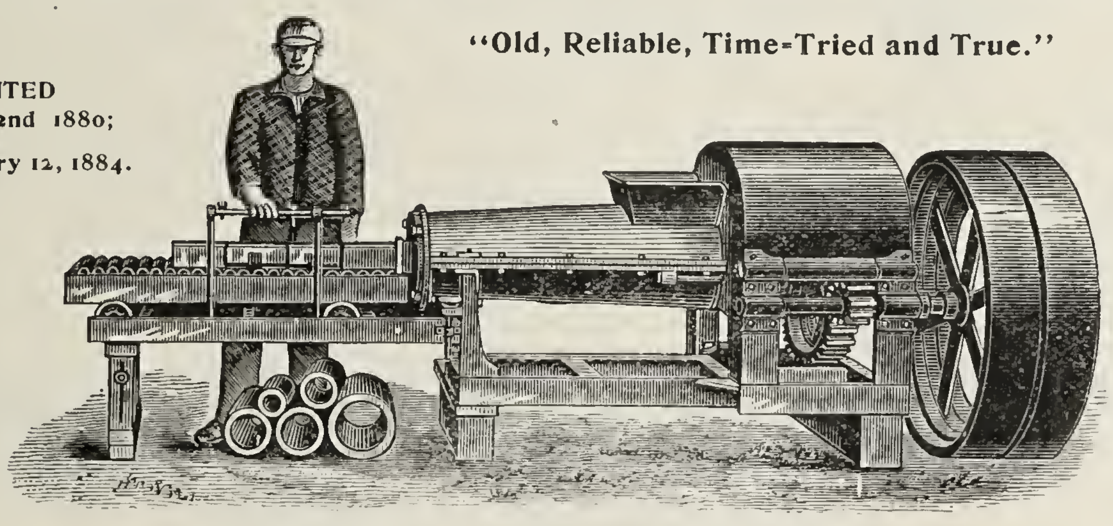

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THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

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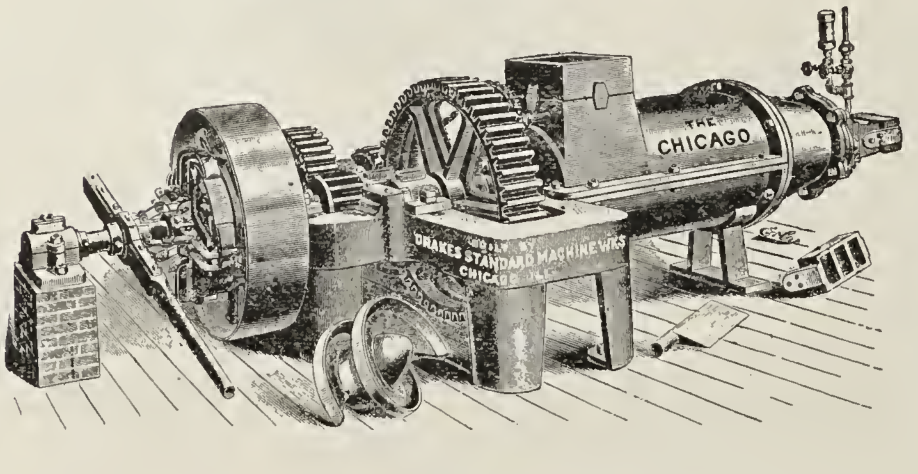
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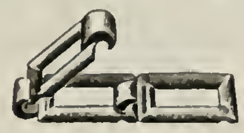

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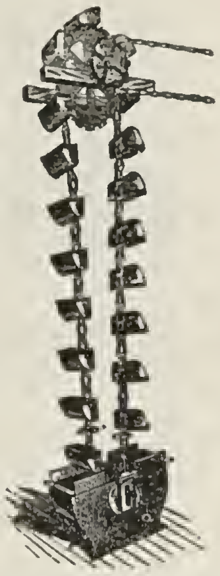

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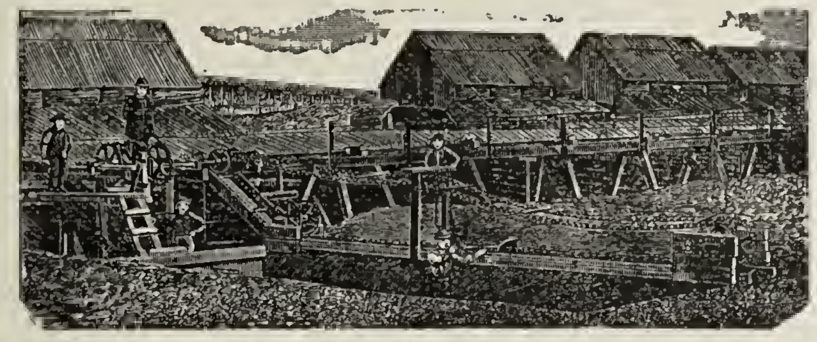

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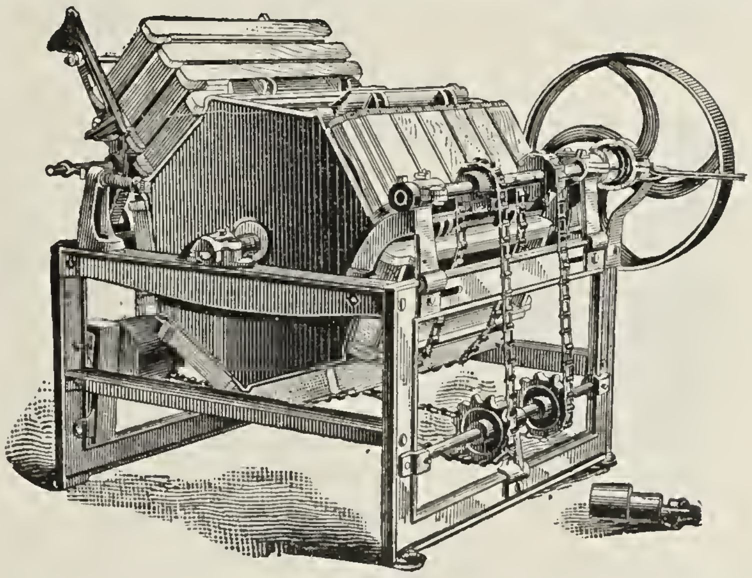

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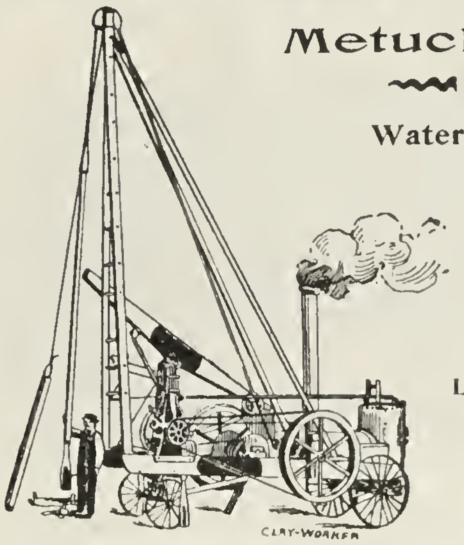

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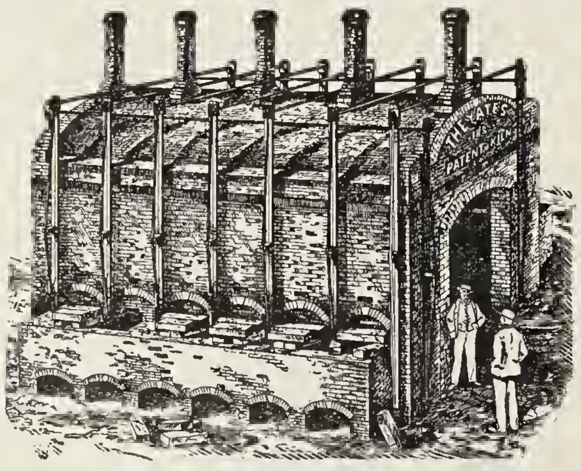

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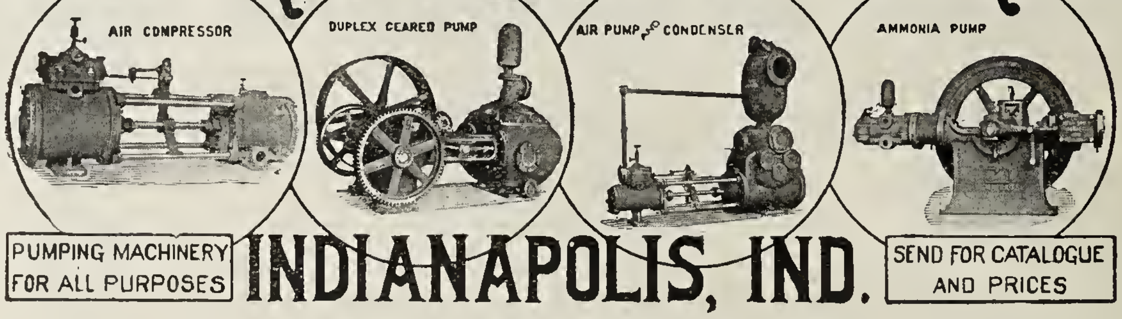

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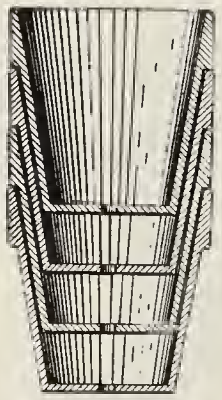

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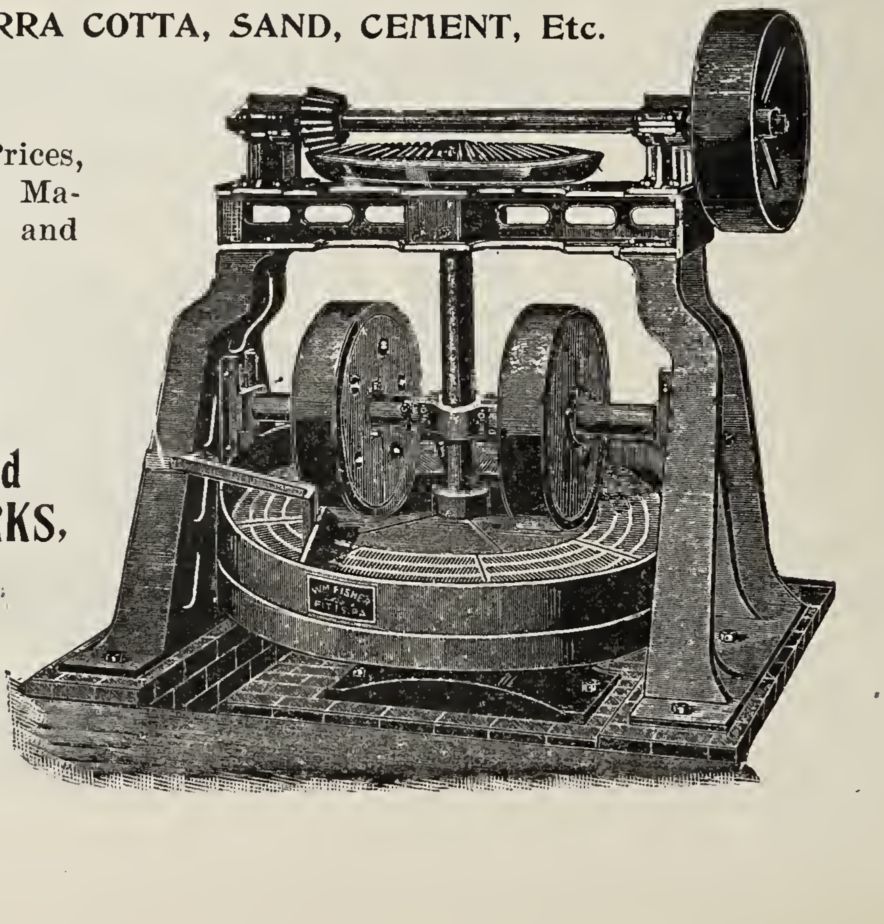

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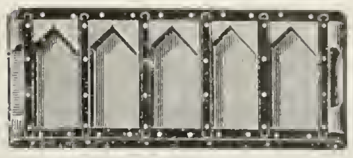

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*11:35 pm	1:36 am	7:00 am

*Daily.

All trains carry first-class coaches. 12:35 noon train has Parlor and Dining Cars for St. Louis. 11:35 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket Offices, 48 West Washington St., 46 Jackson Place and Union Station.

W. W, RICHARDSON, Dis. Pass. Agt.

WEST and SOUTH

run the lines of the Illinois Central Railroad and the Yazoo & Mississippi Valley Railroad, reaching into the eleven States of

South Dakota
Minnesota
Iowa
Wisconsin
Kentucky
Tennessee
Arkansas
Mississippi
Illinois, Indiana, Louisiana,

Presenting an unequaled territory for diversified industries, and possessing

**Fine Sites for New Mills,
Best of Freight Facilities--Coal Fields--Close Proximity to Distributing Centers.
Intelligent Help of all Kinds.
Many Kinds of Raw Material.**

To sound industries, substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered Textile Industries in the South by a number of good places. GEORGE C. POWER, Industrial Commissioner I. C. R. R. Co., Chicago.

St. Louis Terra Cotta Co.,

....MANUFACTURERS OF....

Architectural and Ornamental Terra Cotta.

Works and Office, 5801 Manchester Ave.,
T, LOUIS, MO.

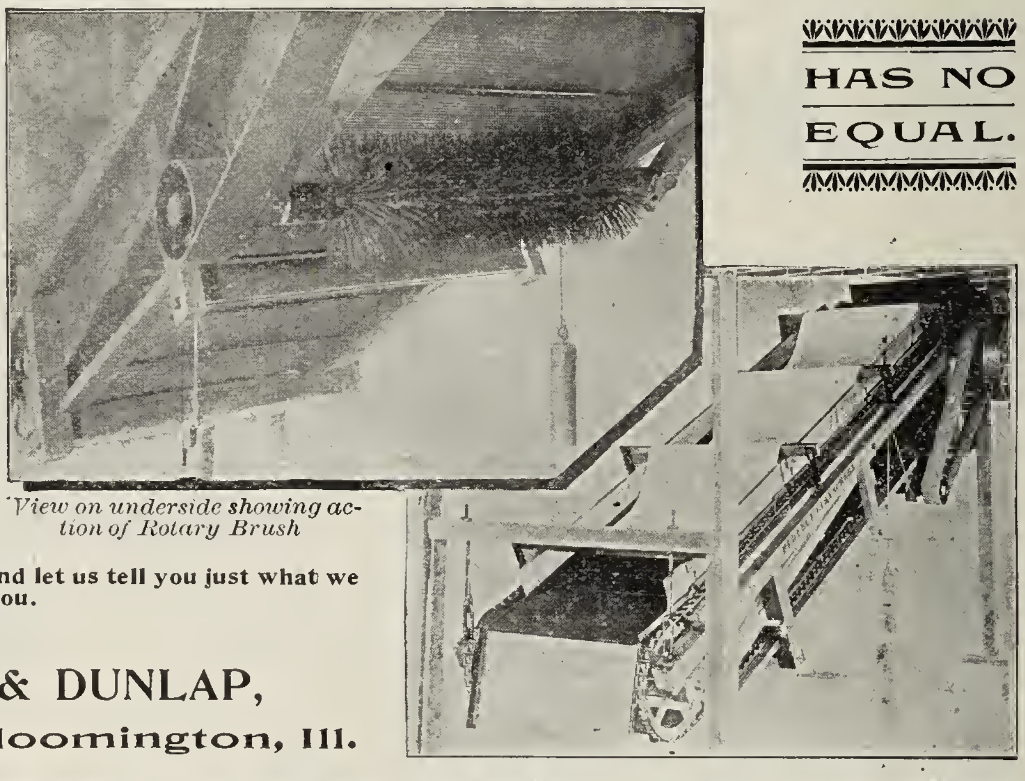
In Stock: Diaper Tile of all sizes, Caps, Coping, String and Belt Courses, Panels, Skewbacks, Etc.

ESTIMATES FURNISHED ON APPLICATION.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.
Increases grinding capacity.
Gives a finer grade of clay
Does the work as well in cold weather as in warm.
Screens cold moist clay as well as dry.
It will more than save its cost in one Winter.

HAS NO EQUAL.



View on underside showing action of Rotary Brush

Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

STRIKING INCLINE SCREEN

For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.

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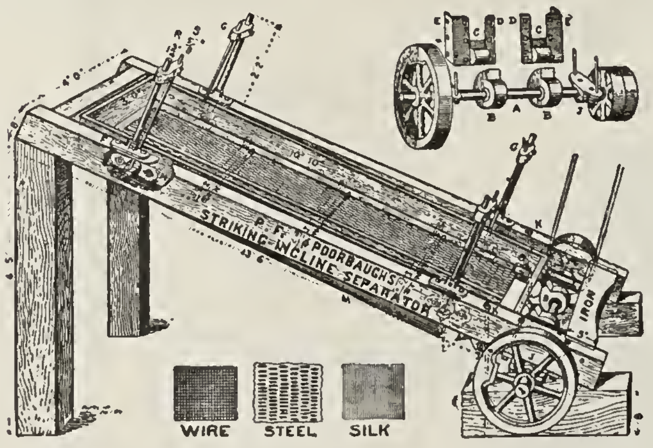


These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

Manufactured by the

THE PITTSBURG MINERAL SCREEN CO.

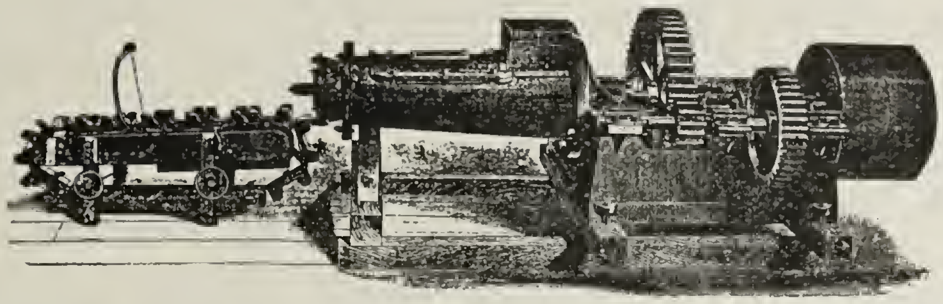
Write for Prices. PITTSBURG, PA.

Mention the CLAY-WORKER,
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers ... of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

NEW DISCOVERY KILN

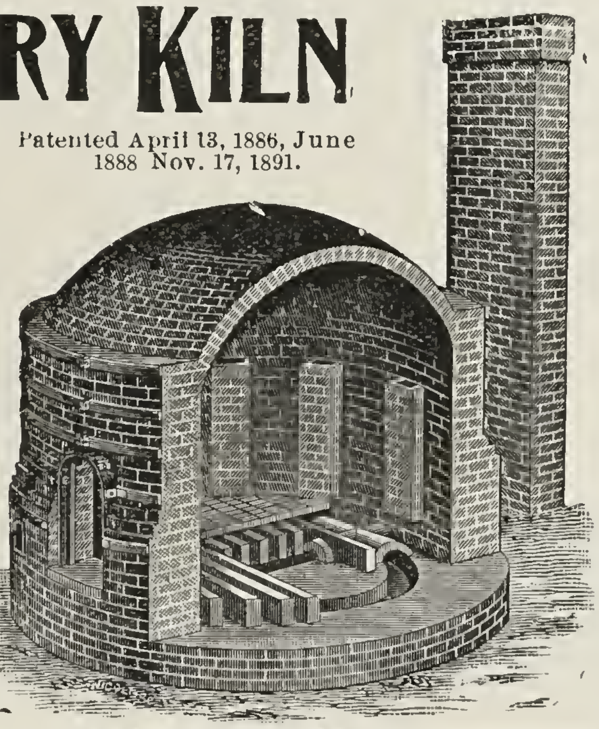
Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.



E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } **Chenoa, Ill.**

The "PEERLESS" UP-DRAFT ....KILN.

• • •

For Burning....
DRY PRESSED,
RE-PRESSED,
ORNAMENTAL or
COMMON BRICK.

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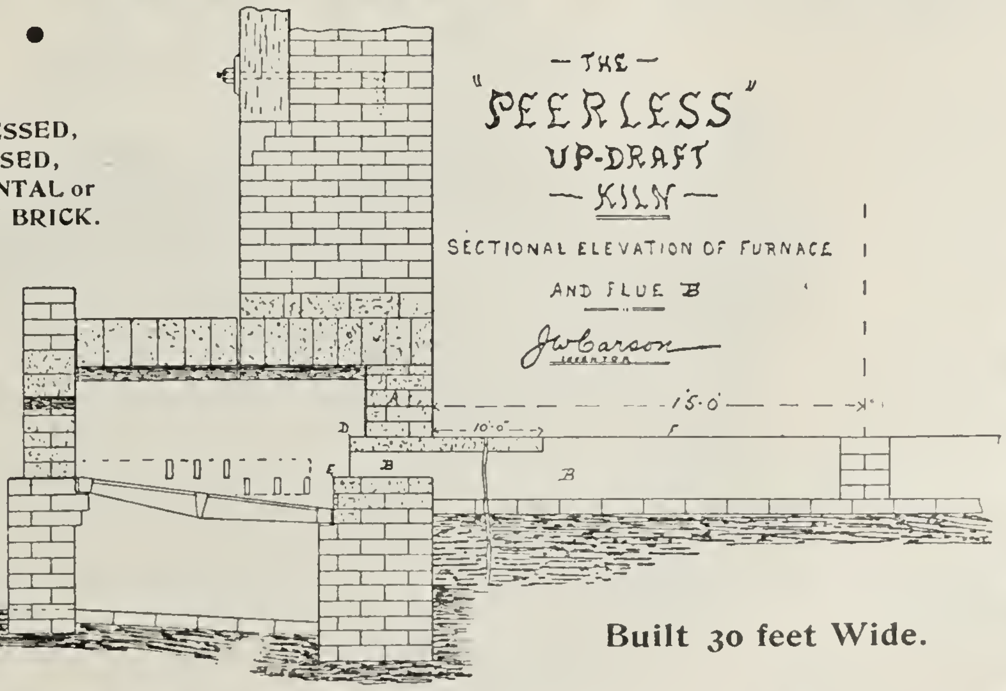
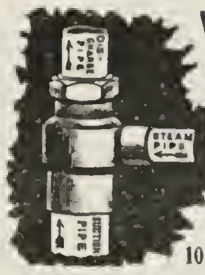
Write for Circulars, Testimonials or Information on Economical Burning to



Built 30 feet Wide.

J. W. CARSON, LaPrairie, P. Q., Can.



VANDUZEN STEAM JET PUMP
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
Always in Order, never Clogs nor freezes. Every Pump Guaranteed.
——10 SIZES.——
200 to 12000 Gallons per Hour.
Cost $7 to $75 each. Address
THE E. W. VANDUZEN CO.,
102 to 108 E. Second St., Cincinnati, O.

Indiana, Decatur & Western

RAILWAY.

Short line between **INDIANAPOLIS** and **KANSAS CITY**. The only line running Reclining Chair and Sleeping Cars between **INDIANAPOLIS**, and **DECATUR, SPRINGFIELD, JACKSONVILLE** and **HANNIBAL, MO.**

Through Sleeping Cars to St. Louis, Mo., via I. D & W. Clover Leaf Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.	
Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
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Fast Express	3.35 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.

LAKE ERIE & WESTERN RAILROAD. NATURAL GAS ROUTE

Solid Train Between
Sandusky and Peoria
—AND—
INDIANAPOLIS and
MICHIGAN CITY,
FT. WAYNE and
CONNERSVILLE.

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Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.	
No. 20 Passenger	7:00 a. m.
*No. 22 Passenger	1:20 p. m.
No. 24 Passenger	7:00 p. m.
SOUTH BOUND—ARRIVES.	
*No. 21 Passenger	10:20 a. m.
No. 23 Passenger	2:50 p. m.
No. 25 Passenger	6:20 p. m.

*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on A. H. SELLARS, Agent,
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C. F. DAILY, Gen. Pass. Agt.
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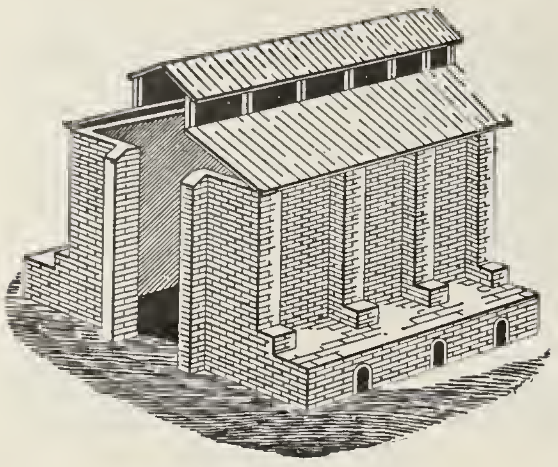
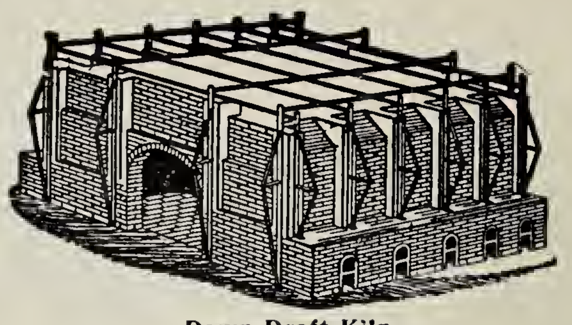
SIMPLICITY
THE DOTS
IN OUR HALFTONES
HAVE A SHARP PRINTING QUALITY.
SEND FOR '98 CATALOG
INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.


Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, 2,422 Chestnut St., *Kansas City, Mo.*

The ALSIP Improved Down and Up-Draft KILN

Is burning brick successfully where patent Down-Draft and patent Up-Draft Kilns proved complete failures.

It has **no equal for uniformity** in **burning, hardness** of **ware** and **economy in fuel.**

The **Alsip system** of **utilizing waste heat** from **cooling kilns, saves Thousands** of **dollars** in **fuel** every **year.**

The simplest and most successful system in use.

Investigate and be convinced.

Any information at my command will be cheerfully given on the subject of drying and burning clay ware.

Address, **S. H. ALSIP,**

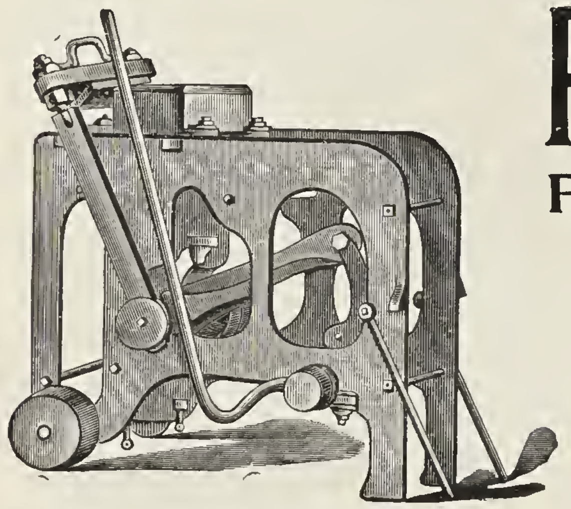
Days Brick Works. *BELLEVILLE, ILL.*

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

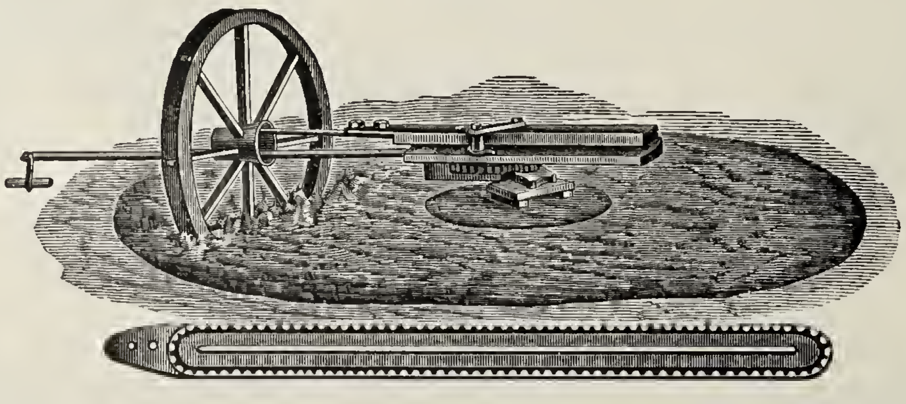
Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.


RED BRICK PRESS.

GEORGE CARNELL,

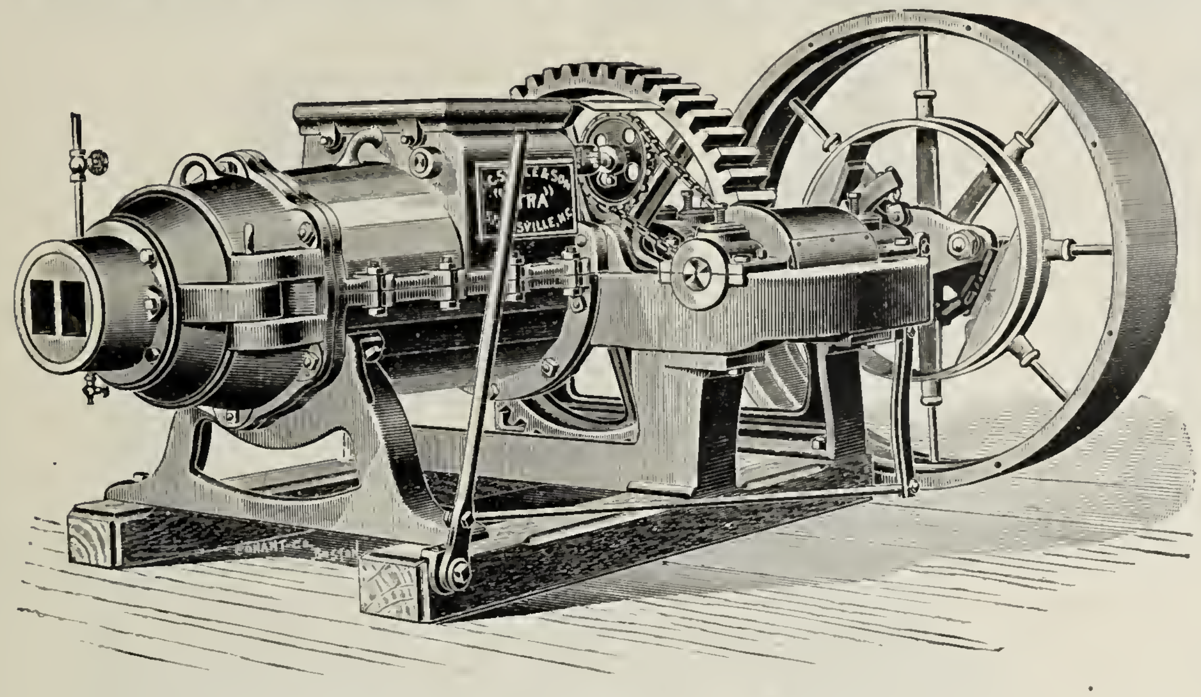
Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

Send for Circular and Price-List.


These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS,
Mention the CLAY-WORKER.

Five Steele Machines SOLD IN OCTOBER,



X-tra Machine. Capacity 25,000.

Because they are Built Right and Sold Right.

Lavinia, Ga., September 12th, 1898.

Messrs. J. C. Steele & Sons,
Statesville, N. C.

Gentlemen:—Your favor received, and in reply beg to say that the Steele Brick Machine is as good as I want. Can make 40,000 per day with it. I am more than pleased with the automatic cut-off. Yours truly,
J. H. SEWELL.

Mr. Sewell is using our Xtra Machine with automatic cutting table.

J. C. STEELE & SONS,
Manufacturers of
The "NEW SOUTH" BRICK MACHINERY,
Statesville, N. C.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

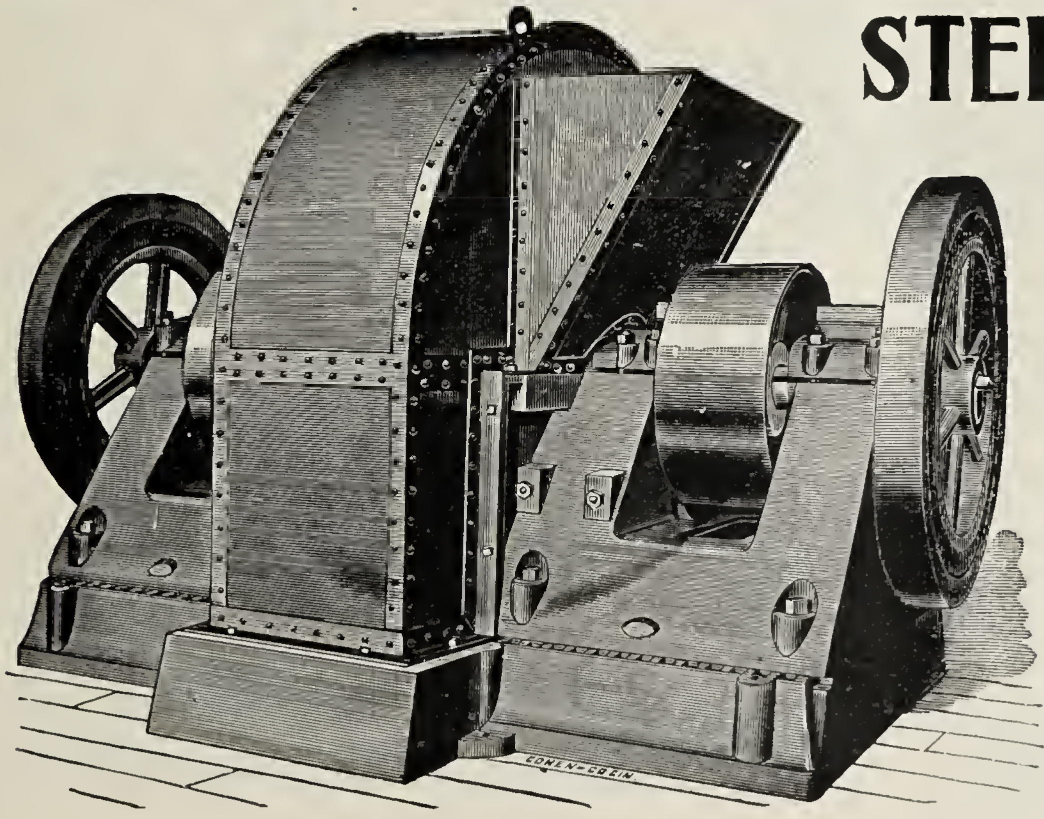
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition

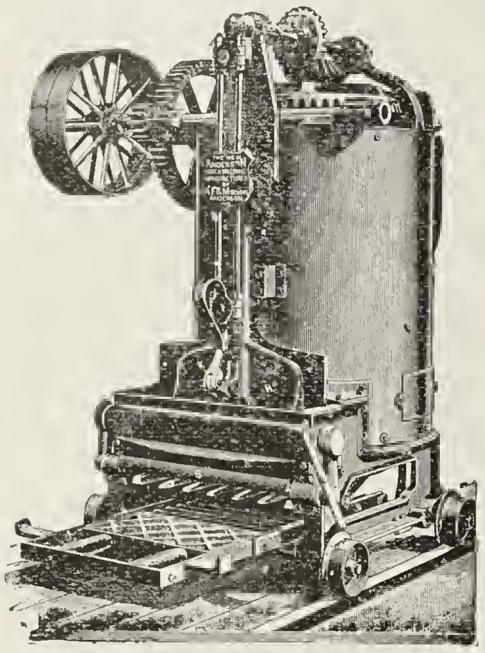
Its construction is such that it **will not clog** in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,
Aurora, Ind.

New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

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Write
for
Catalogue
and
Prices.

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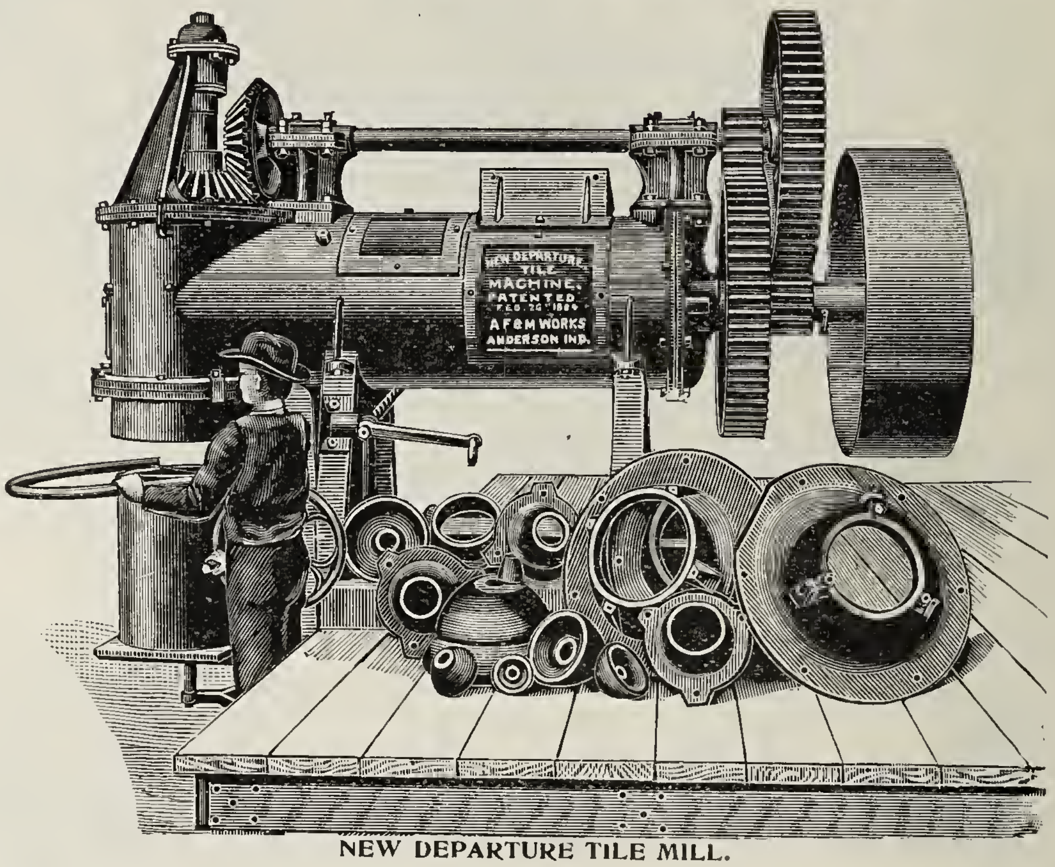
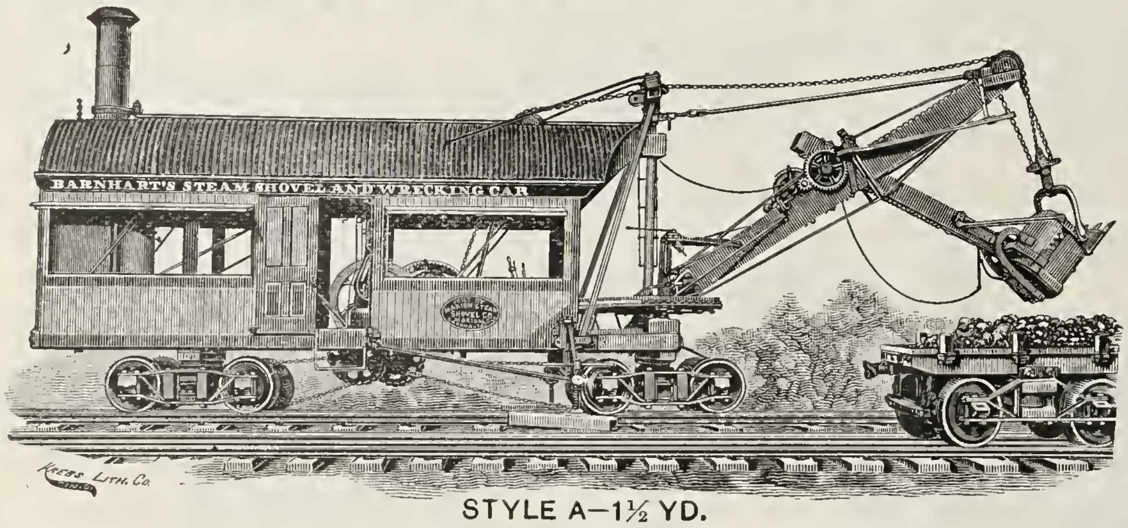

NEW DEPARTURE TILE MACHINE. PATENTED
A F & M WORKS ANDERSON IND.

NEW DEPARTURE TILE MILL.

The New Departure Tile Mill. The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS, - - Anderson, Indiana

Steam Shovels for Brickyards.


BARNHART'S STEAM SHOVEL AND WRECKING CAR
Krebs Lith. Co.

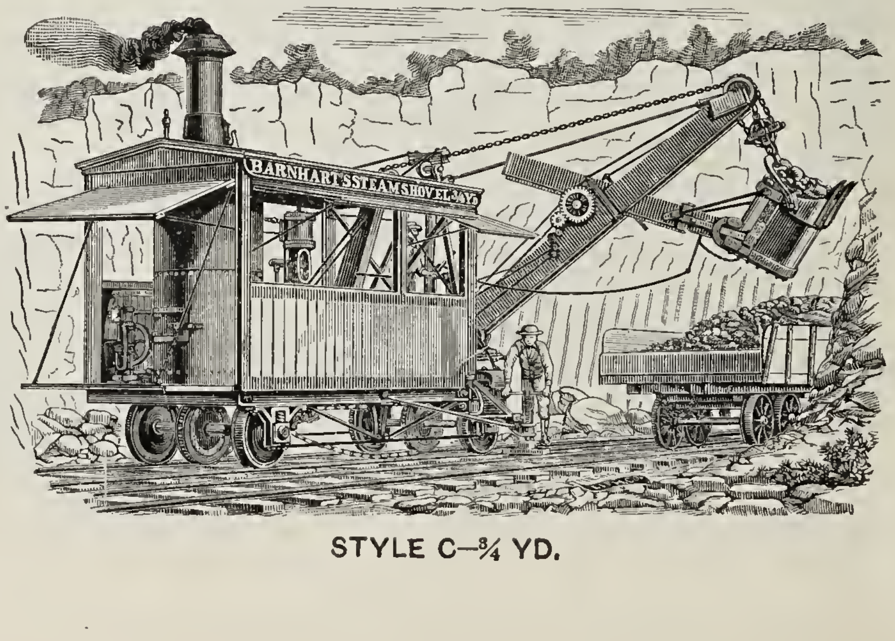
STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

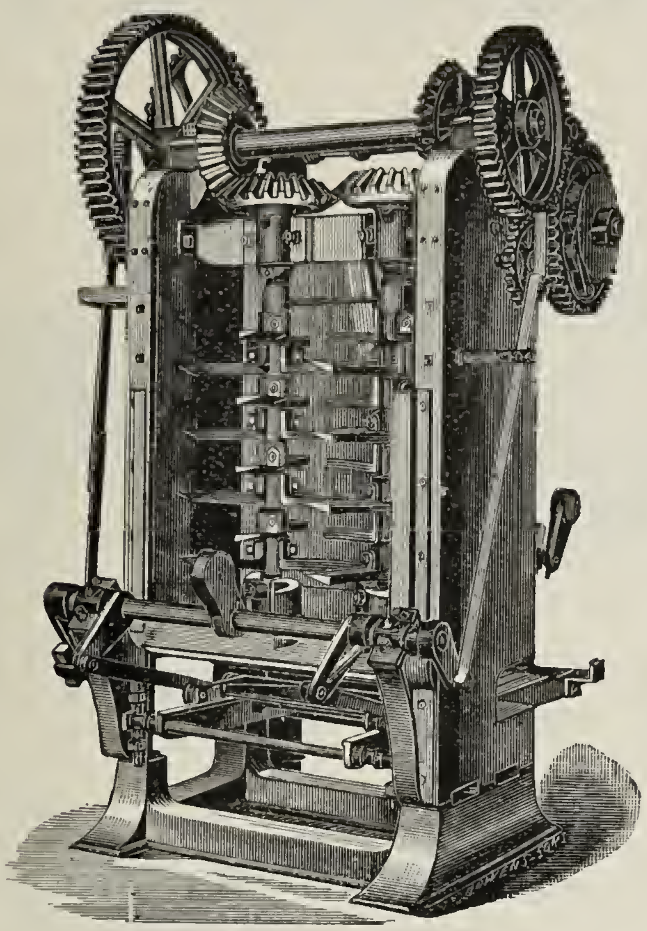
The Marion Steam Shovel Co.,
603 West Center Street, - **MARION, OHIO.**



STYLE C—¾ YD.

THE DUPLEX,

Is the Standard of all Soft Clay Brick Machines.



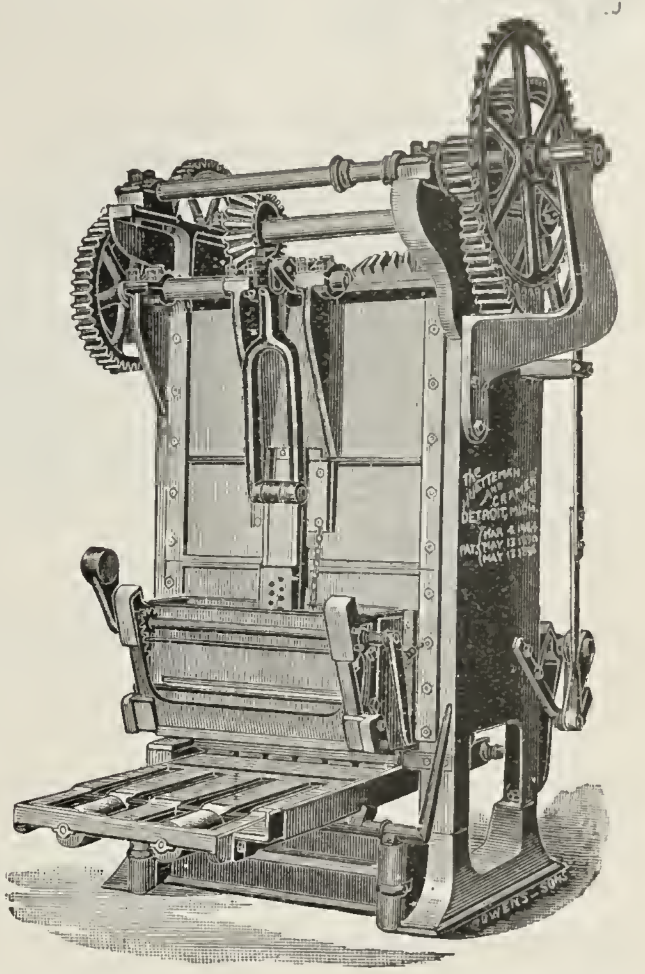
It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE
AND PRICES TO

The Huetteman
& Cramer Co.,

Manufacturers of the Duplex Brick Machine and general outfit for brickyards,

12, 14 & 16 Sherman St.,
DETROIT, - - MICH.

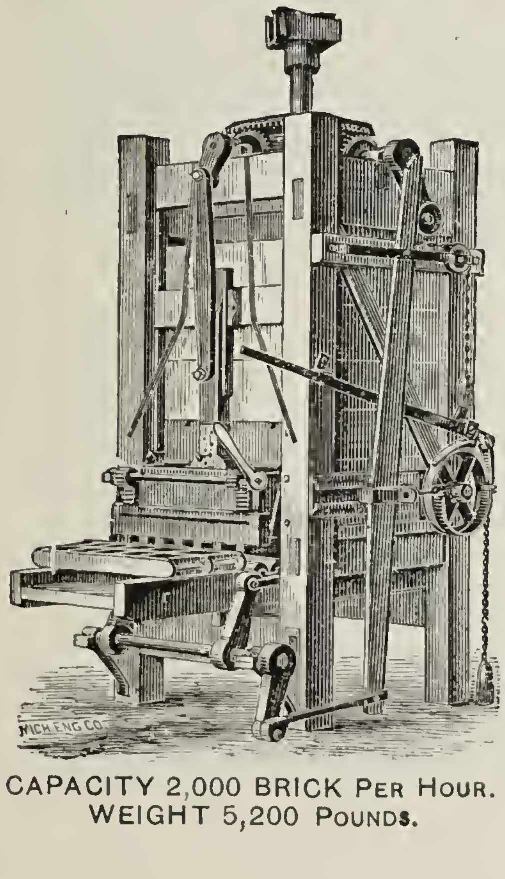

THE HUETTEMAN AND CRAMER DETROIT MICH.
PAT.

THE HENRY MARTIN BRICK MACHINE MFG. CO.,

ESTABLISHED 1857. LANCASTER, PA., U. S. A. INCORPORATED 1887.

INVENTORS, MANUFACTURERS AND EXPORTERS OF STEAM AND HORSE POWER

Brickmaking Machinery.



CAPACITY 2,000 BRICK PER HOUR.
WEIGHT 5,200 POUNDS.

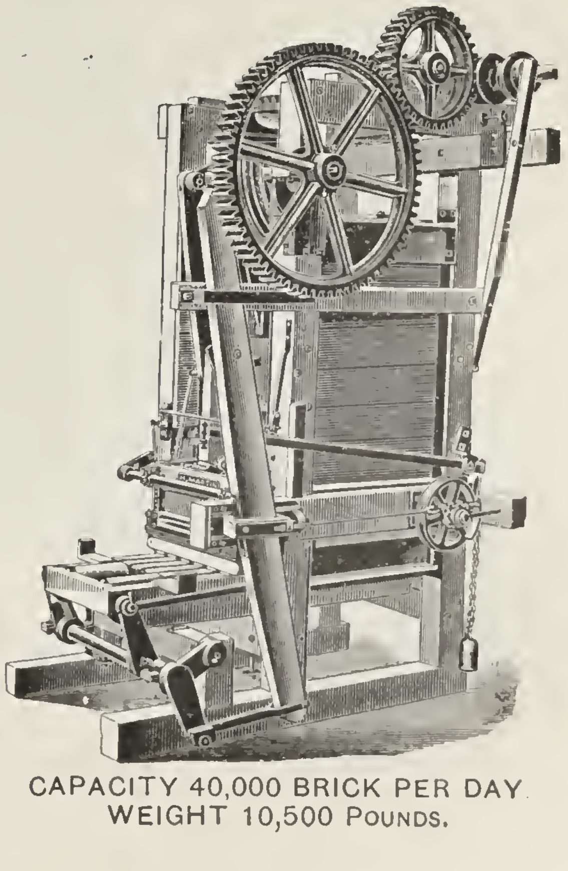
Horizontal Pug Mills,
Moulds, Patent Double and
Single Decked Trucks,
Barrows, Turn Tables, Etc.

Plans, specifications and illustrated Catalogue of complete plants will be furnished free of charge on application. We warrant our Machines to work in any kind of clay that can be worked by hand, and to make brick of any ordinary size.

Stone Crushers,

Clay Crushers, Sand Grinders, Clay Screens, etc., etc. . .

Telegraphic Address, "Martin, Lancaster. ✱ Postal Telegraph-Cable Co. wires in our Office.

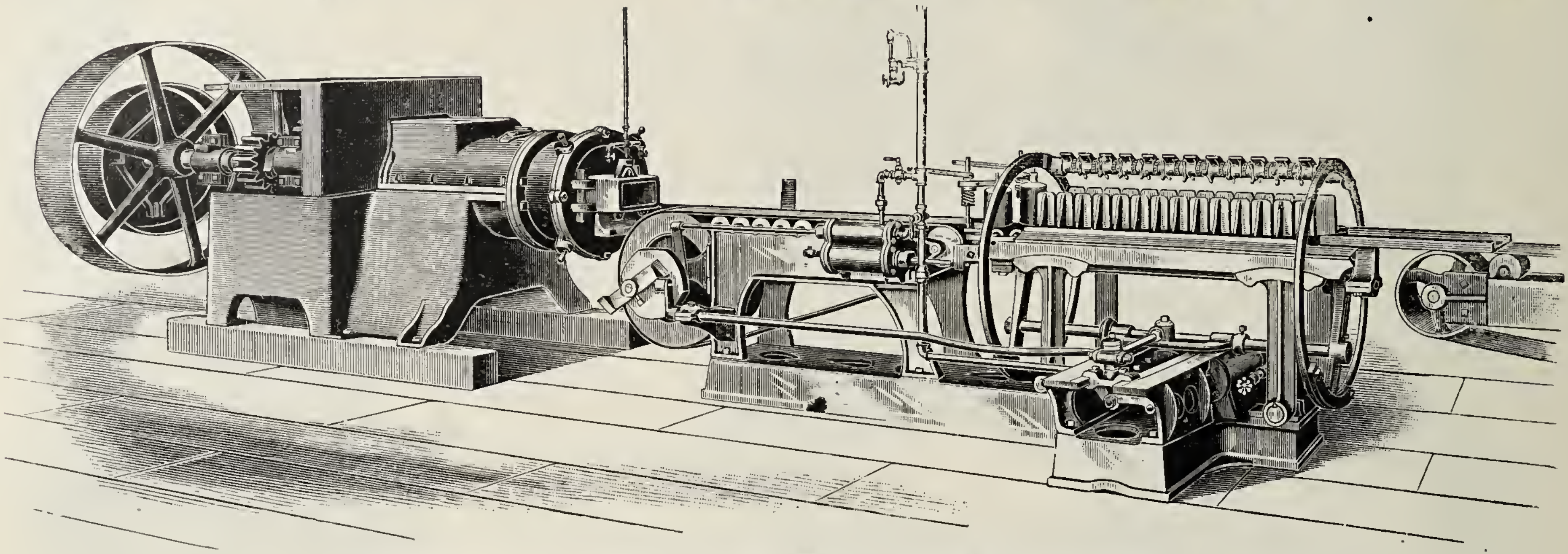


CAPACITY 40,000 BRICK PER DAY
WEIGHT 10,500 POUNDS.

THERE'S ONE BRICK MACHINE

That does the most work of the highest quality with the least power and repairs,

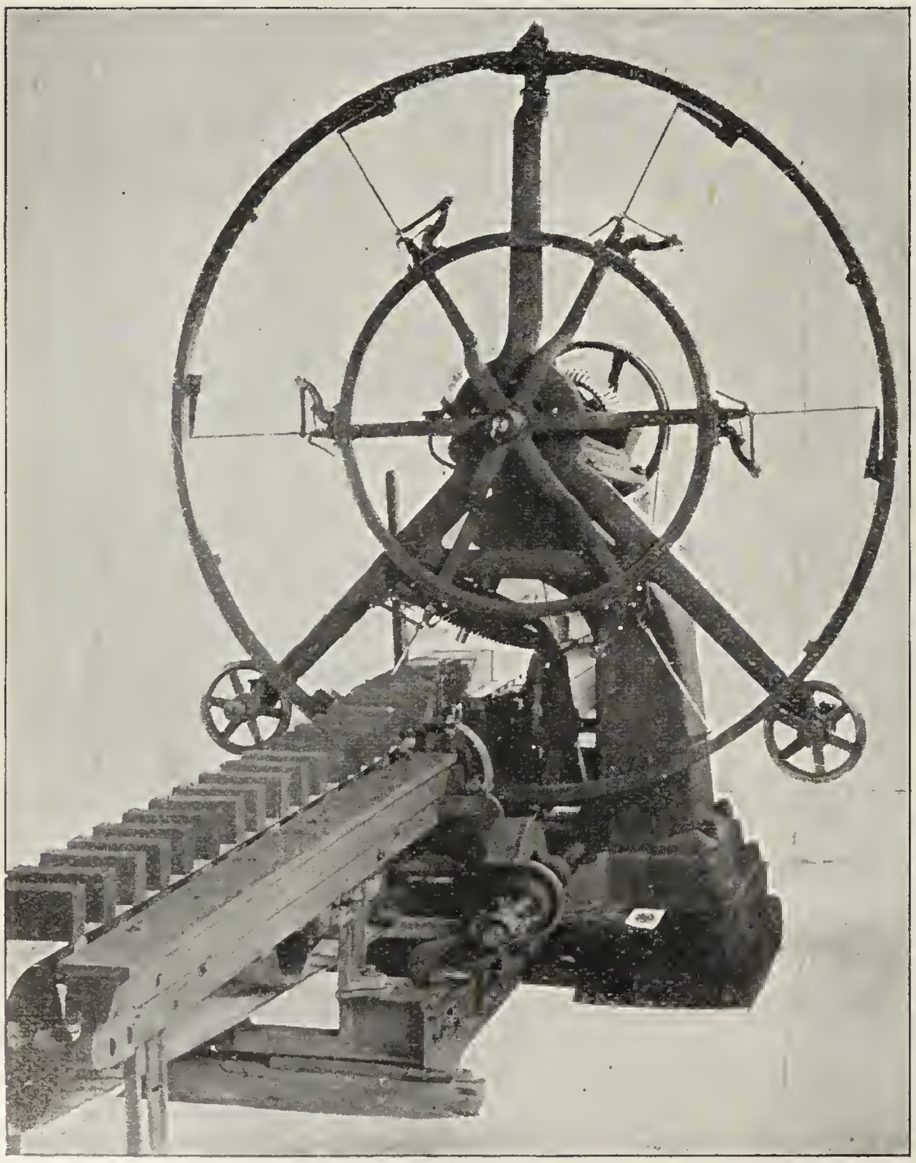
That's the Leader.



LEADER No. 25, SIDE CUT DIE AND AUTOMATIC CUTTER.

Send your address for printed matter.

LEADER MANUFACTURING CO., Decatur, Ill.



The Chambers Automatic Side-Cutter.

Automatic Side-Cutter For Stiff-Tempered Brick Machines.

A ROTARY CUTTER, simple in construction, reliable and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute of the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

The machinery is above the dirt and all gearing encased.

MANUFACTURED and GUARANTEED. . . . .

Chambers Brothers Co.,
PHILADELPHIA, PA.

Morrison's Latest Improved Kiln,

FOR BURNING BUILDING BRICK.

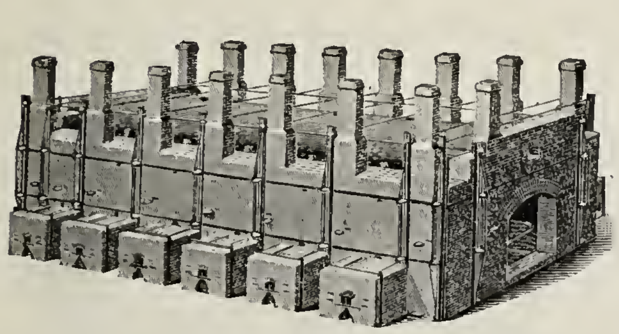
IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,
P. O. Box 335. *ROME, GA., U. S. A.*

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.



These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

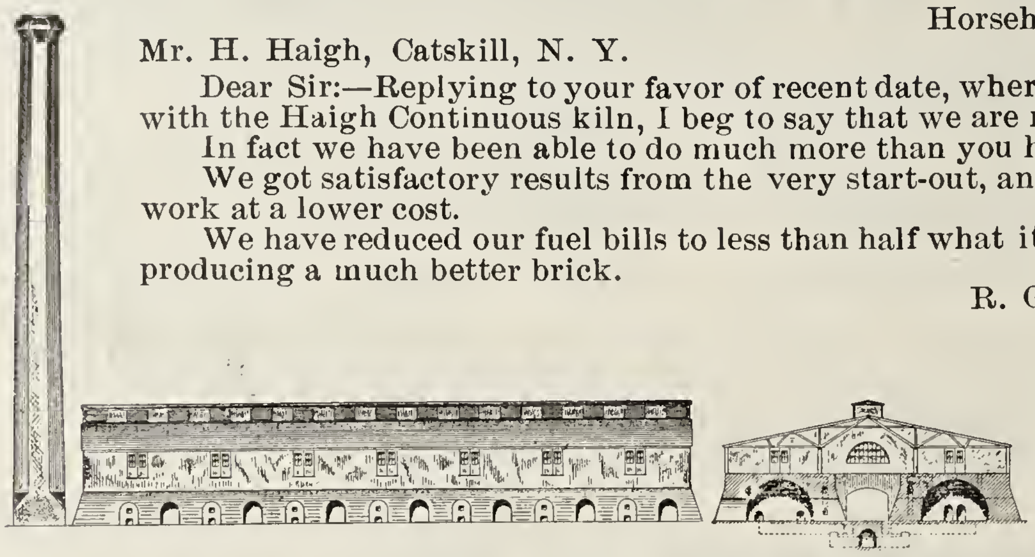
W. A. EUDALY, 509 Johnston Bldg. **Cincinnati, Ohio.**

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.



Horseheads Brick Co., N. Y., August 13, 1898.

Mr. H. Haigh, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success.

In fact we have been able to do much more than you had guaranteed the kiln would do.

We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours,
R. G. EISENHART, Treas. and Gen. Man.

This kiln has now been in operation nearly two years, it was guaranteed to burn 25 M per day, at a cost of 25 cents per M with fuel at $2 per ton; I am told it is burning nearly 35 M per day at a cost very much lower than guaranteed.

Address H. HAIGH, Catskill, N. Y.

The Lehmann Portable Continuous Kiln,

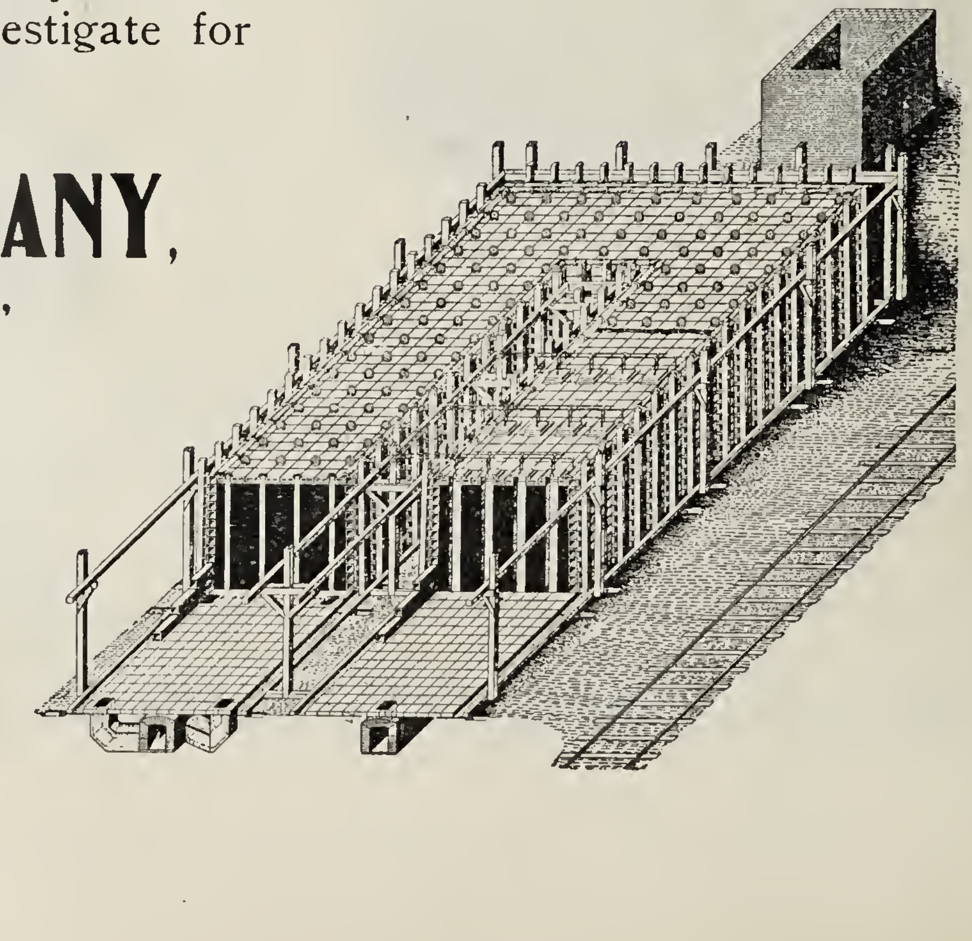
And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

F. LEHMANN & COMPANY,

Foot of West Wellington Street,
CHICAGO, ILL.

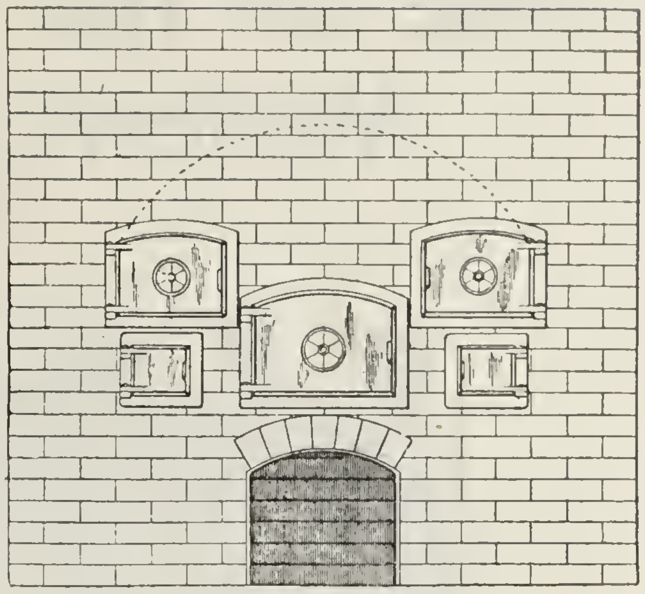
Kiln Builders, Consulting Clayworker Engineers, Plans and estimates furnished for Brick, Lime and Cement Works. Practical tests made.



THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.

The GRATH FURNACE.

Gas Producing,
Consuming
and Coking



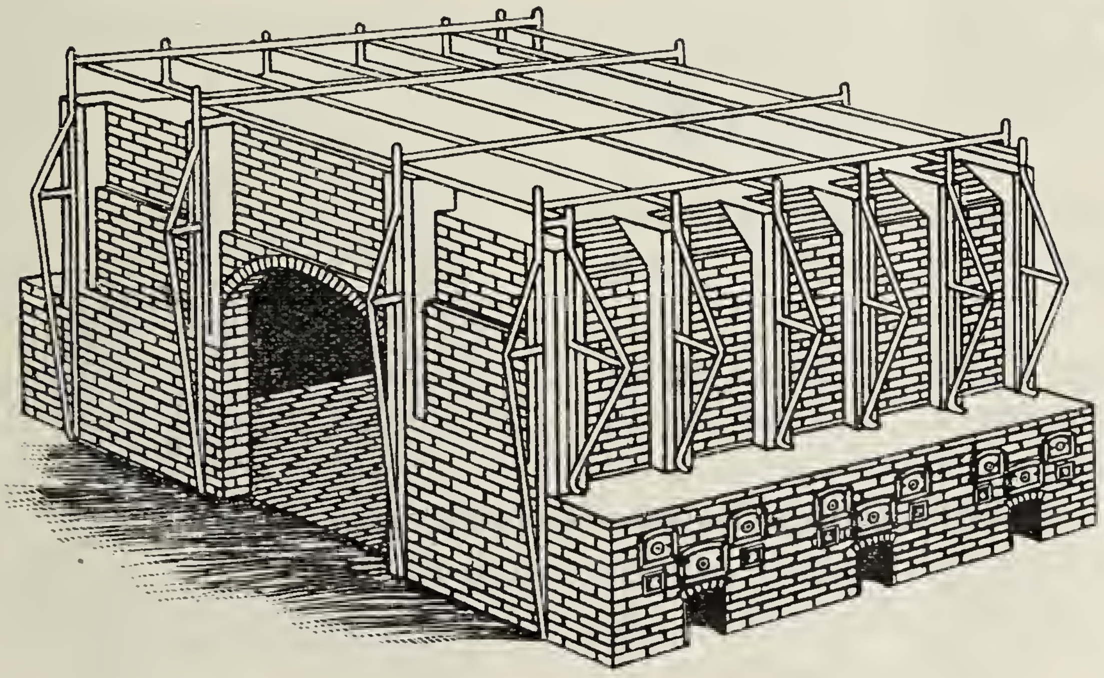
The most important invention of the age for producing a Steady and Uniform heat of any degree of intensity out of the cheapest quality of slack coal. Applicable to kilns for burning brick or for annealing Iron or Steel as well as for boilers or where ever heat is required.

This is the **ONLY** Furnace which consumes **ALL** the black smoke and which will produce as much heat from one ton of slack coal as can be obtained from same amount of lump coal in the ordinary Furnace.

This is the **ONLY** Furnace ever invented where a part of the heat from the fire box or furnace is drawn under the gas or coking table, which process heats the table or tables to a red hot heat, thus making a genuine gas Producer and Consumer, as the gases as soon as liberated from the coal, are ignited and consumed by being drawn over the incandescent heat of the coke in the fire box or boxes. After the gases are all distilled and consumed from the coal, a solid mass of red hot coke remains on the Gas Table which is then shoved over on the grate bars or fire box by a very simple operation of the fireman. A fresh supply of slack is then placed on the Gas table which instantly begins to generate and consume the gases.

This is the **ONLY** Gas and Coking Furnace that produces a steady and continuous incandescent heat and gas flame combined. The principle embodied in this furnace is a new one and is fully protected in our Patent which has just been granted, and we hereby give notice that we will prosecute all persons using a gas or coking furnace in which the heat or part of the heat from the furnace or fire box is drawn underneath the Gas or Coking Table unless such parties using same secured the right from us.

* * *



PATENTED.

The GRATH

IMPROVED
DOWN-DRAFT

BRICK KILN,

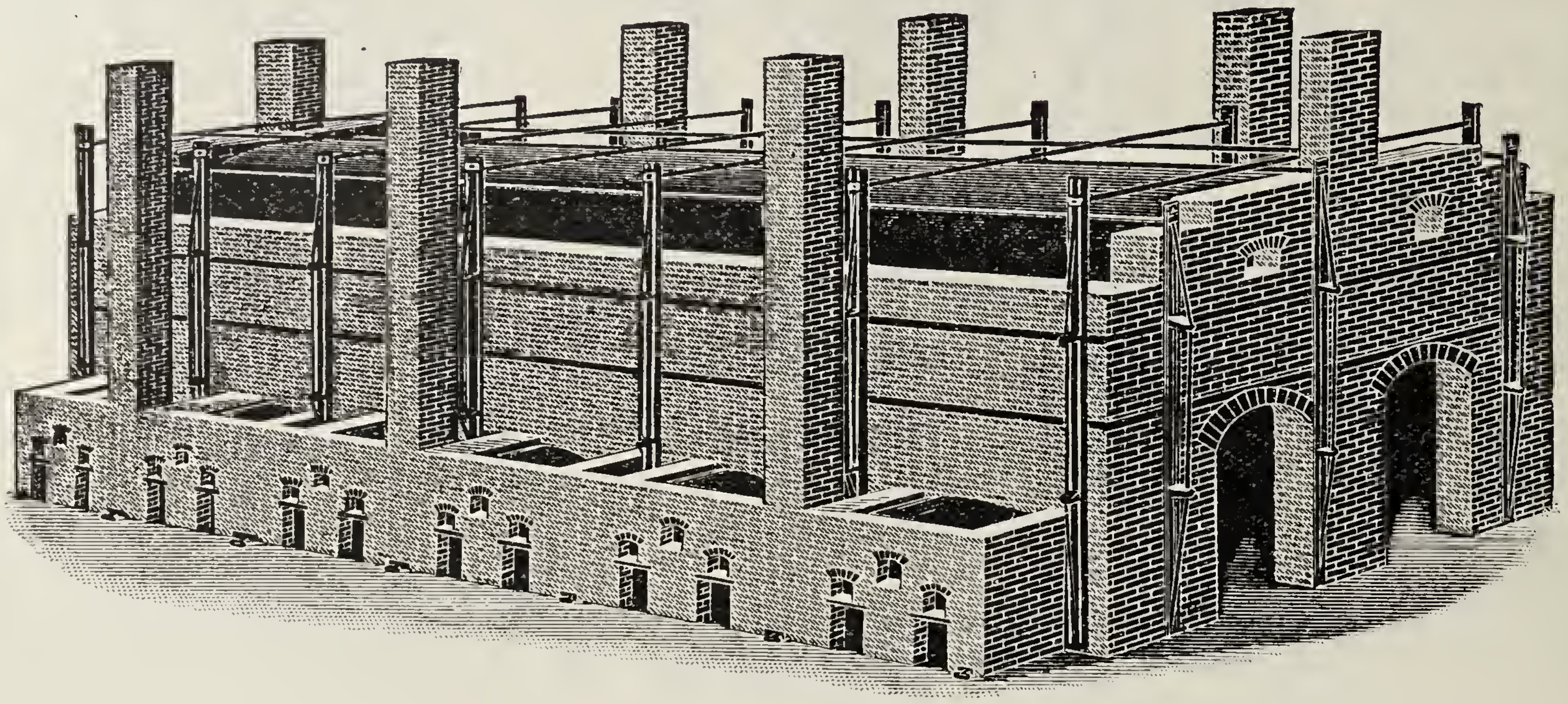
With the Grath Gas and Coking Furnaces attached will produce a larger percentage of Face or Vitrified brick, than any other kiln in the market.

FOR FURTHER PARTICULARS, ADDRESS

The ILLINOIS SUPPLY & CONSTRUCTION CO.,
St. Louis, Mo.

"One of the Greatest Inventions of Modern Times."

F. W. BUTTERWORTH,
Asst. Gen'l Man. Marion Brick Works.



The Swift SLACK COAL COKING-TABLE Furnace Kiln.

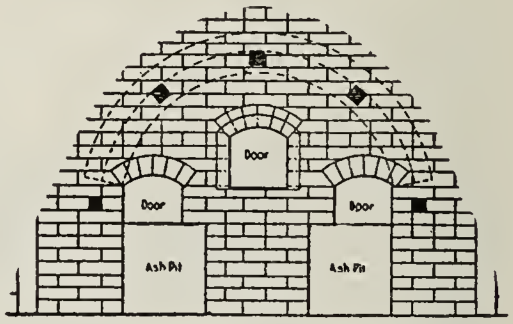
THE KILN which has a solid bottom, which is much cheaper to begin with, and is always in repair.

THE KILN that will save one ton of coal out of every seven tons you are using.

THE KILN which is so constructed that the heat is drawn from the bottom with Fan to dryer without danger of checking the cooling ware.

THE KILN that we will guarantee to burn any kind of clay ware with nothing but Slack Coal from start to finish of burn.

THE KILN that will burn Paving Brick in from 30 to 60 hours less time and not injure the ware, as the cold air is excluded from start to finish.



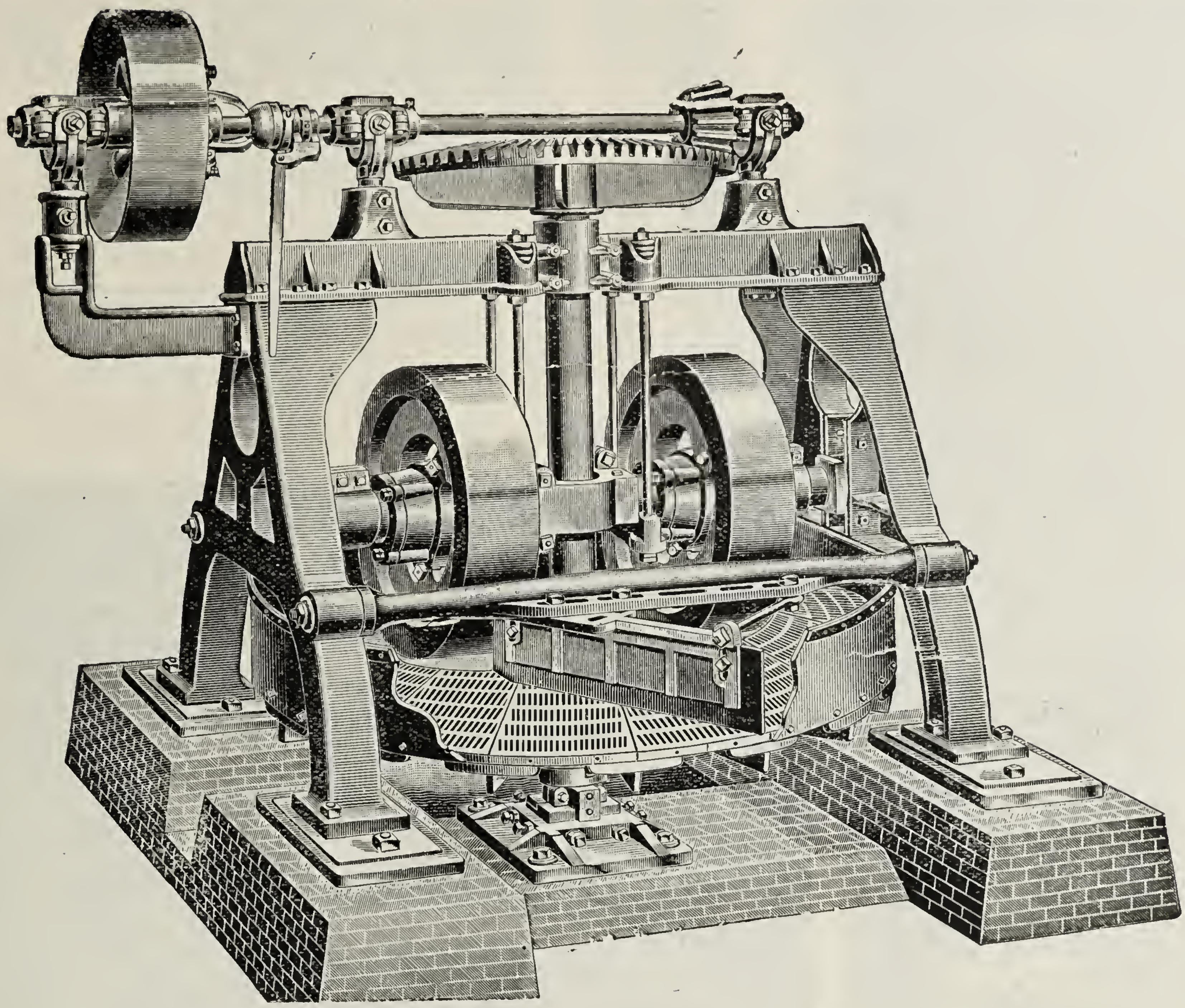
THE SWIFT COKING TABLE FURNACE.

THE KILN that has the famous **Swift Coking-Table Furnace** attached to it; the furnace which is to-day being attached to all kinds of kilns—Up-draft, Clamp, Down-Draft, Round and Square, and also one continuous Kiln, has been re-modeled, and is giving entire satisfaction.

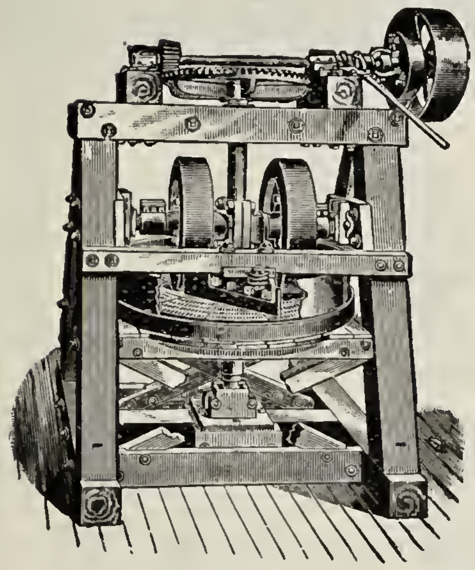
F. E. SWIFT,

Send for Catalogue.

Washington, Iowa, U. S. A.

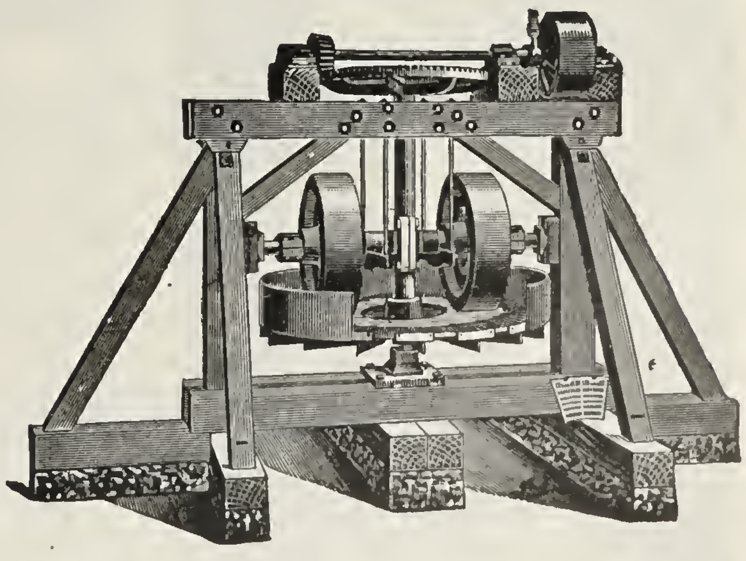


OUR SPECIALTY IS **DRY PANS.**



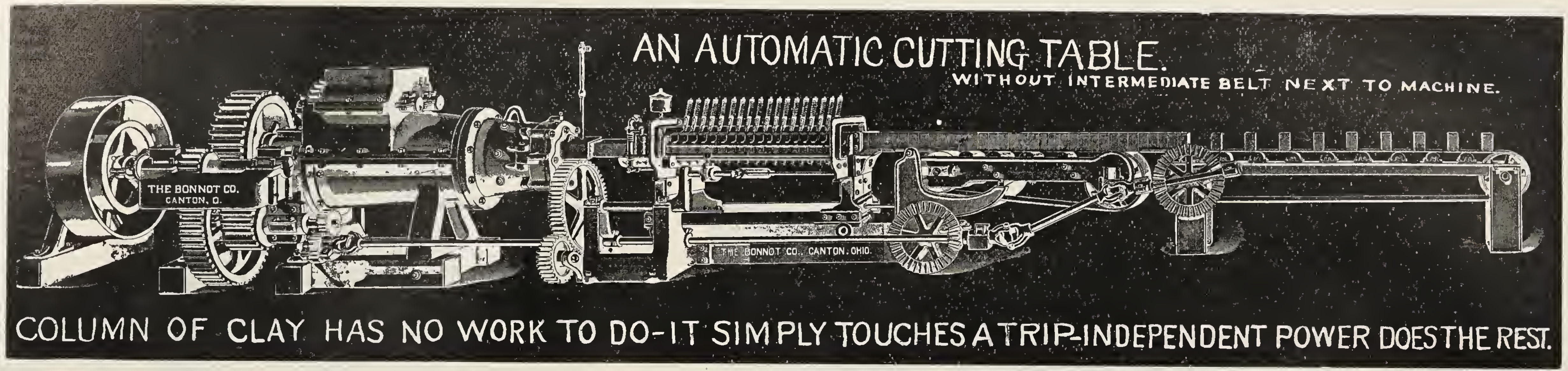
IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



......SEND FOR NEW ILLUSTRATED CATALOGUE......

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.


AN AUTOMATIC CUTTING TABLE.
WITHOUT INTERMEDIATE BELT NEXT TO MACHINE.
THE BONNOT CO. CANTON, O.
THE BONNOT CO., CANTON, OHIO.
COLUMN OF CLAY HAS NO WORK TO DO-IT SIMPLY TOUCHES A TRIP-INDEPENDENT POWER DOES THE REST.

IF OUR AUTOMATIC TABLE IS
BETTER THAN OTHERS

Why Better?

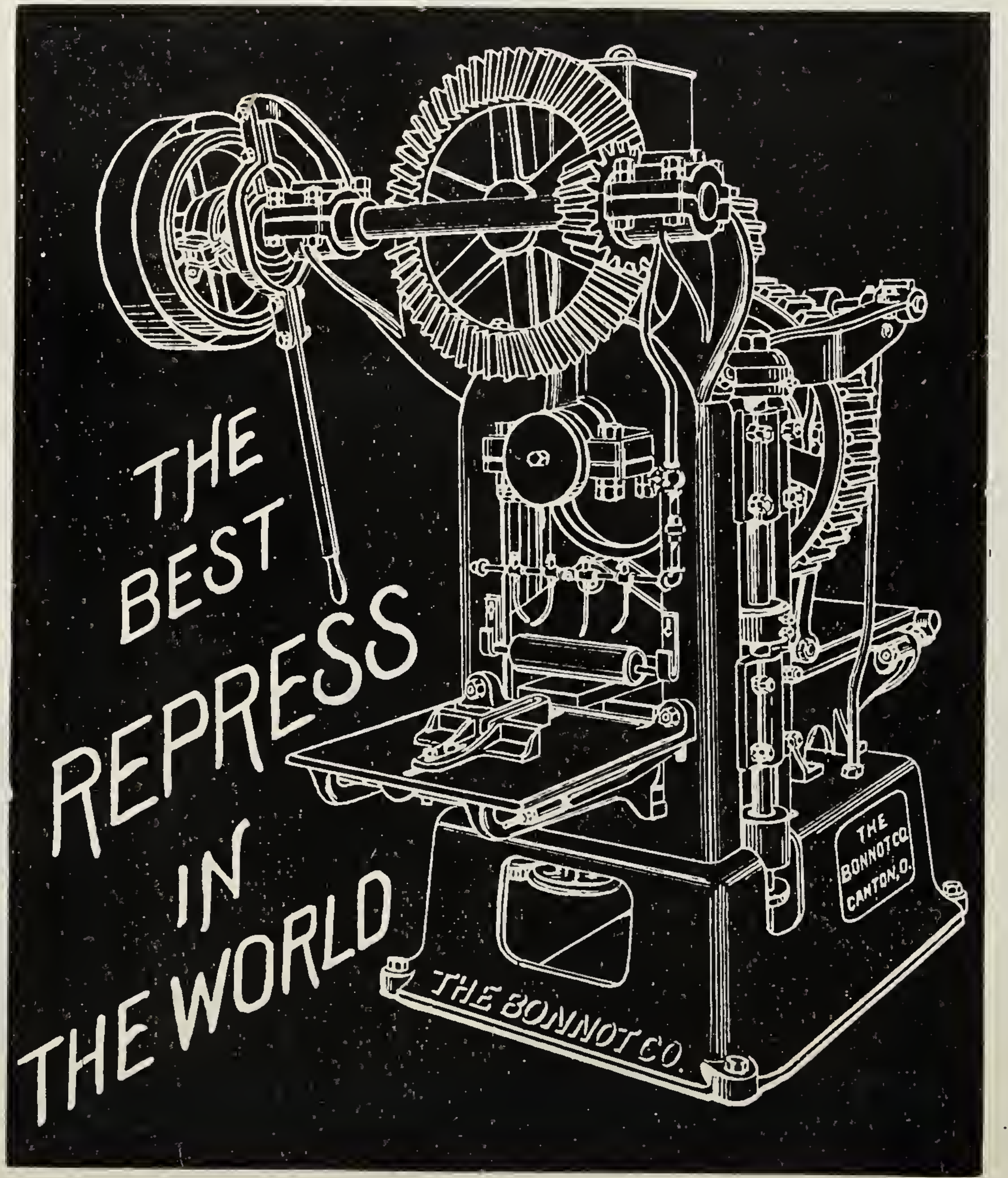
We can Tell You Why.
Write for Printed Matter.

Everybody who investigates decides in favor of the

Canton Table.

⁂

The Bonnot Company,
CANTON, OHIO.


THE BEST REPRESS IN THE WORLD
THE BONNOT CO. CANTON, O.
THE BONNOT CO.

Mack Manufacturing Company.

New Cumberland, W. Va.
April 12th, 1898.

The Bonnot Co.,
Canton, Ohio.

Gentlemen:—We are glad to report to you that the Cutting Table has never given us any trouble since we started it up and it is doing excellent work. Both this and your Double Repress give better satisfaction than any machinery we have ever tried.

Yours truly,
[Signed] Mack Mfg. Co.
S. G. Guillard, Supt.

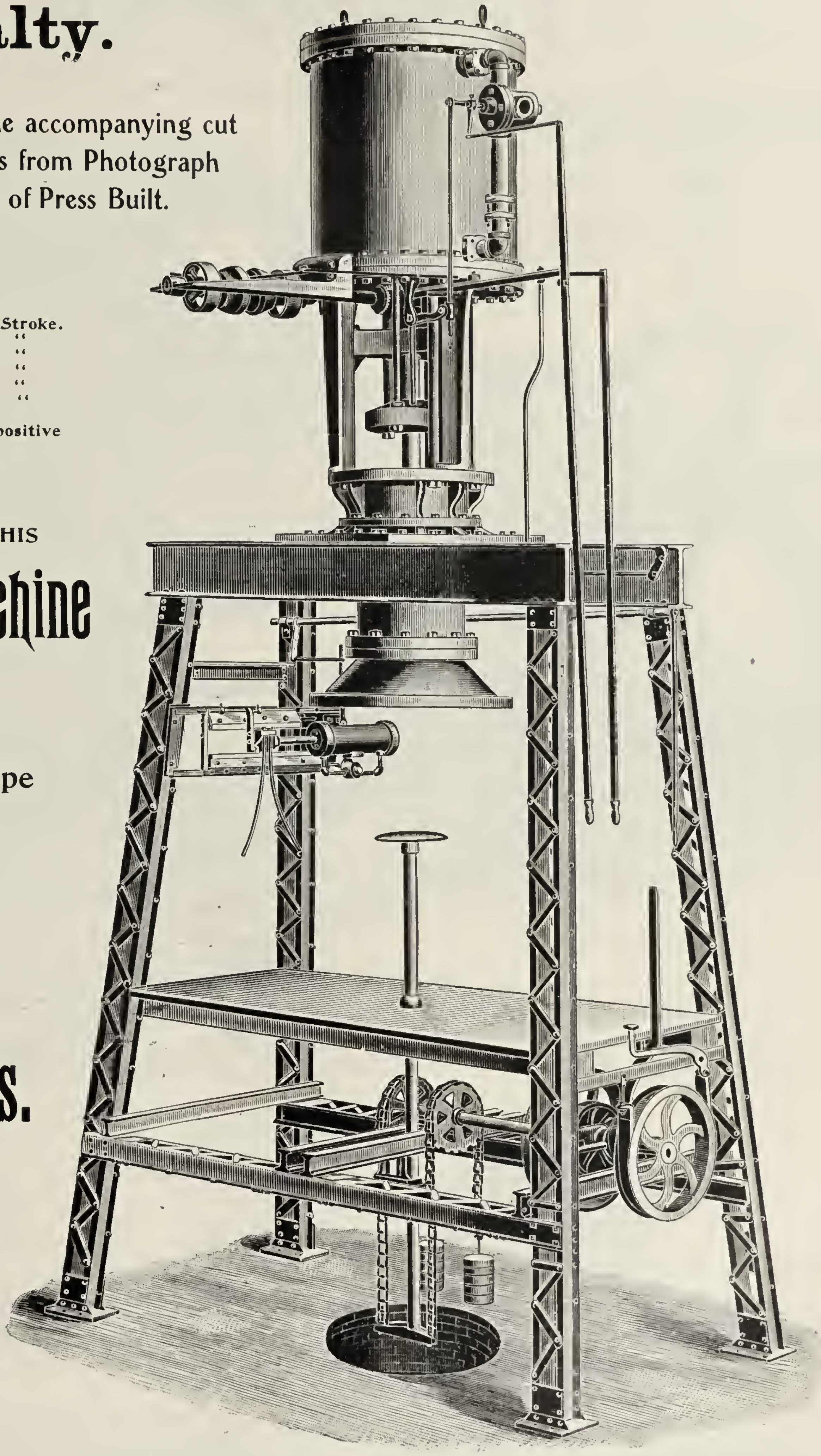
Since the above date, later orders from this Company attest their appreciation.

SEWER PIPE AND TILE MACHINERY,

Our Specialty.

The First Machine of this Type was manufactured for Montague & Co., Chattanooga, Tenn., November 1897. . .

The accompanying cut is from Photograph of Press Built.



DURING THE PRESENT YEAR
WE HAVE BUILT THESE SIZES:

44 in. Steam Cylinder,	20 in. Clay Cylinder,	42 in. Stroke.
44 " "	20 " "	50 "
48 " "	22 " "	48 "
48 " "	24 " "	48 "
52 " "	24 " "	48 "
52 " "	26 " "	60 "

All the above are in successful operation and are positive witnesses of their Excellence.

—•—

WRITE US FOR DESCRIPTION OF THIS

Strictly Up-to-Date Machine

—•—

To make the Most Pipe
—AND—
To make the Best Pipe

BUY THIS MACHINE
OUR DIES. . . . .

—•—

LET US TELL YOU OF OUR

Steele Frame,
Ball=Bearing

DRY AND WET PANS.

DON'T EXPERIMENT
WITH UNTRIED MACHINES.

"Be Sure You're Right, then Go Ahead."

—•—

Our Pottery Machinery
Is Unequalled.

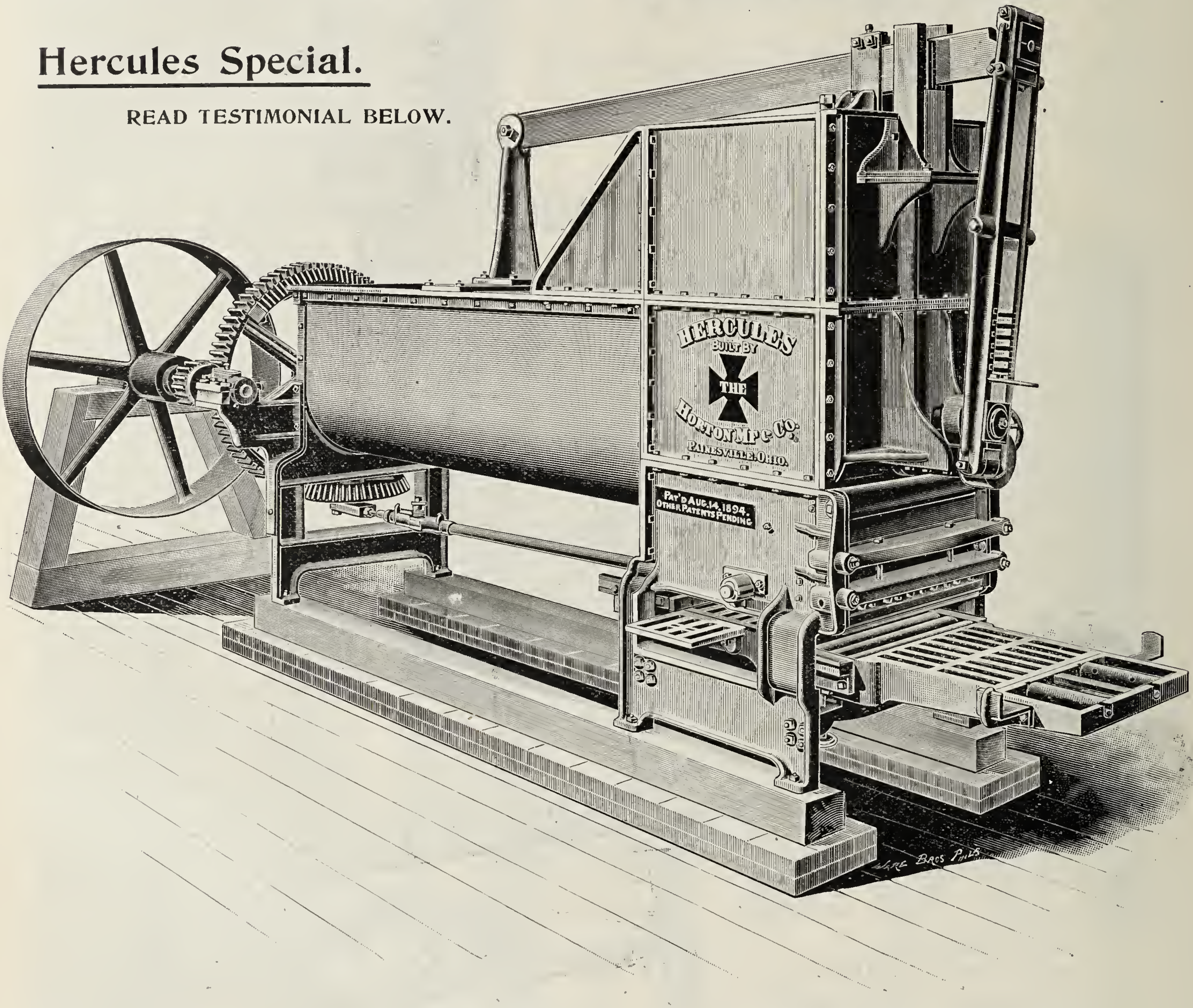
MANUFACTURED BY

TAPLIN, RICE & CO., AKRON,
...OHIO.

Fire! Fire!! Fire!!!
Fire=Brick Machine.

Hercules Special.

READ TESTIMONIAL BELOW.



Bolivar, Pa., Sept. 9, 1898.

Horton Manufacturing Co., Painesville, Ohio.

Gentlemen:—We are pleased to state that the Special Hercules Fire Brick Machine which you furnished us works to our entire satisfaction and we are well pleased with it.

Yours very truly, Reese Hammond & Co.
Per J. B. HAMMOND, Supt.

HERCULES No. 2 for Sand-Molded Brick. Weight 14,800 lbs. Capacity 40,000 to 50,000 in 10 hours.

We make the largest line of Soft-Mud Machinery in the United States.

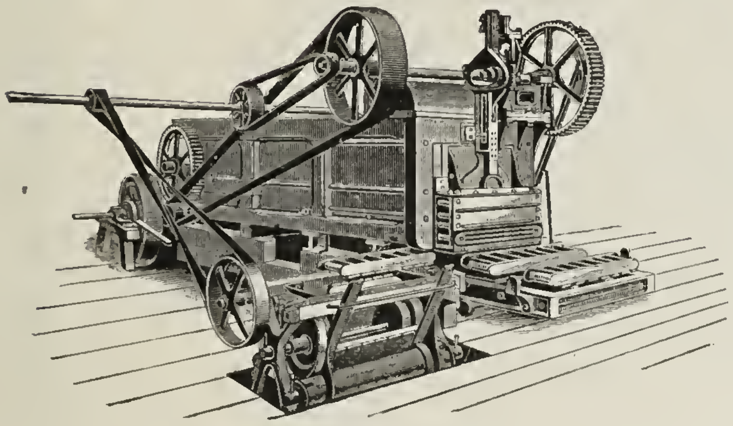
The HORTON MANUFACTURING CO., Painesville, Ohio.

DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the best, namely,

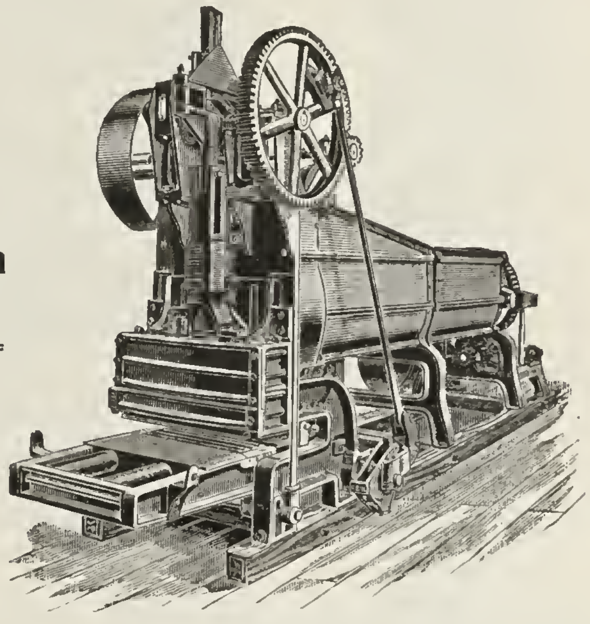
··THE··
POTTS Horizontal Stock Brick Machine

They do all Claimed for Them. You take no chances of an Experiment.



Wood Pug Mill.

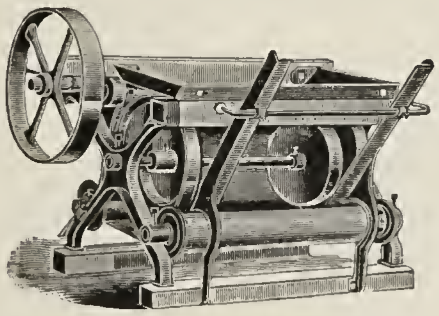
They have no equal for making Brick which have Clean, Sharp Corners and Smooth Surfaces.



Iron Frame Pug Mill.

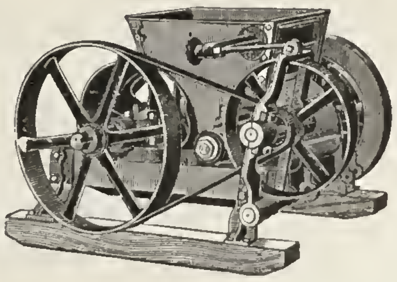
They are the only machines which will work the clay direct from the bank without the use of an extra Pug Mill.

They are **Simple in Construction, Strong and Durable.** Every machine guaranteed to do as claimed for it.



Mould Sanders,

Which have no equal for sanding the moulds, no light complicated parts to wear or break. They do not waste or spill the sand. Guaranteed to do all claimed for them.



Disintegrators,

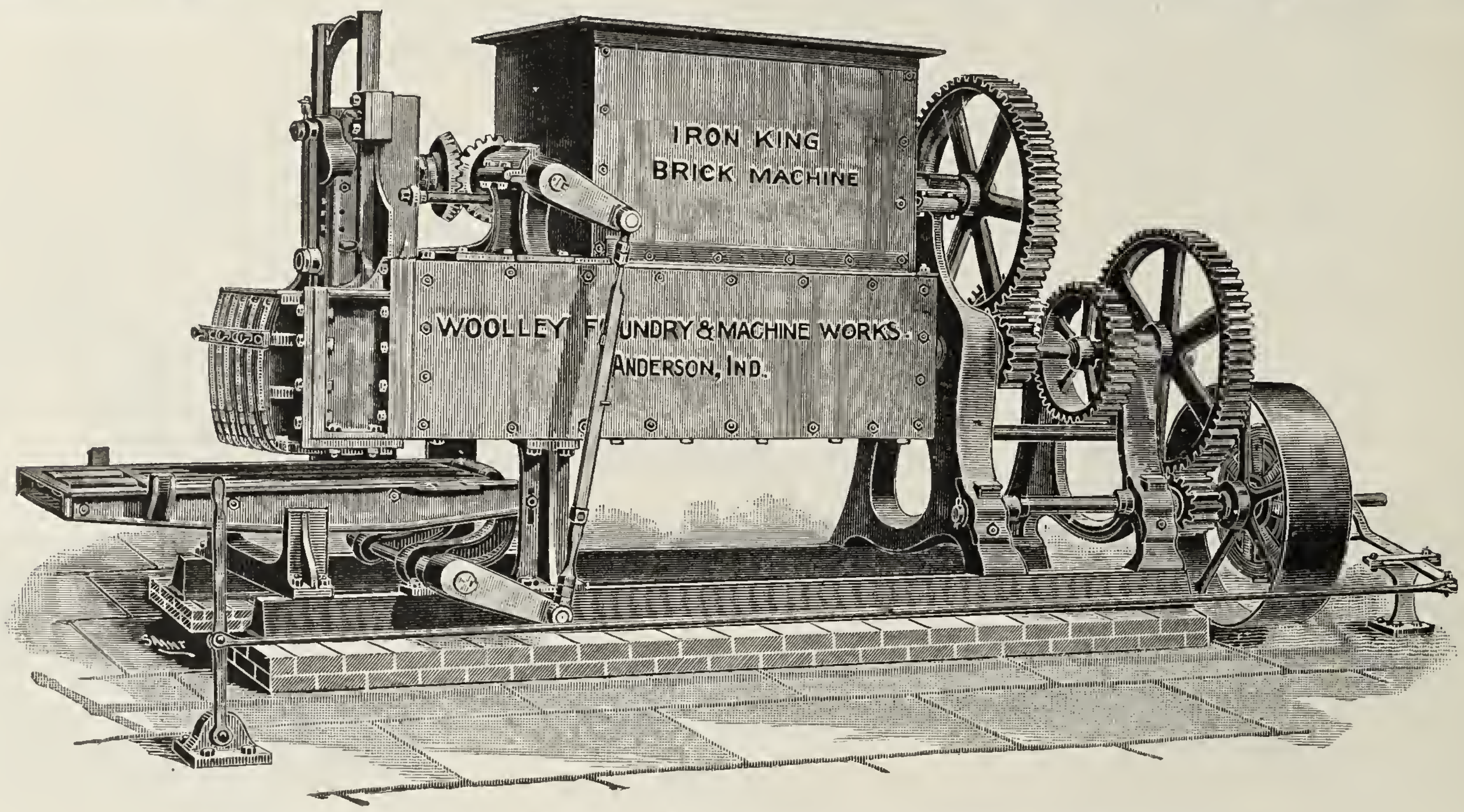
Built of good material, strong and durable. They do the work claimed for them, built in a number of sizes to suit any yard.

For terms and prices of anything needed on the brickyard write

C. & A. POTTS & CO., 814 to 824 W. Wash. St., INDIANAPOLIS, IND.

SUCCESS.

IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good.**


IRON KING
BRICK MACHINE
WOOLLEY FOUNDRY & MACHINE WORKS.
ANDERSON, IND.

A Brick Machine that Never Made a Failure.

Our **"IRON KING"** Brick Machine is made on correct mechanical lines and of material that will "stand the racket" right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

WOOLLEY DRY PANS,
PUG MILLS,
SLIP PUMPS
and PRESSES

Are all made for hard service. If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US
PLEASURE TO QUOTE
YOU PRICES. . . .

Mention the Clay-Worker.

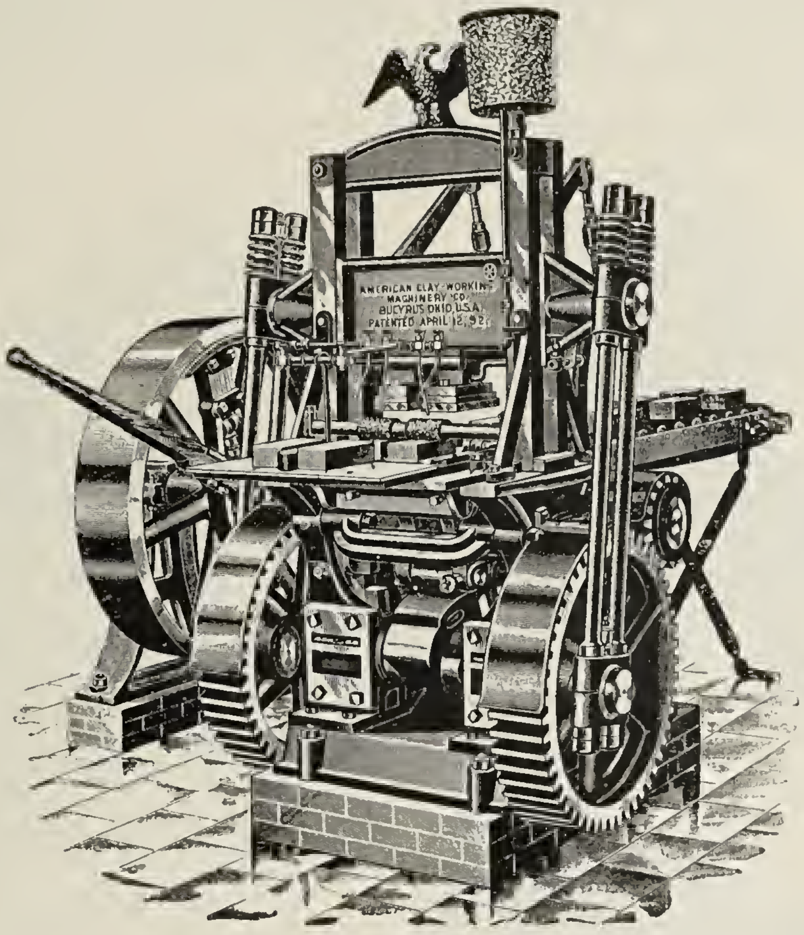
Built Right

…AND…

Run Right.

Many users say the Eagle does more than we promise. None say it does not do all that we promise.

All our machines have records equal to the Eagle.


AMERICAN CLAY WORKING MACHINERY CO.
BUCYRUS OHIO U.S.A.
PATENTED APRIL 12, 92.

We build a complete line of machinery for the manufacture of clay products by every known process. They're the best machines built. Others say so, we only repeat what they say. Send for new '99 catalogue just out.

The Horn of Plenty.

⁂

The Horn of Plenty will be more likely to pour its golden treasure into the hands of the manufacturer who merits it by jealously guarding the quality of his product. The best quality, as well as the greatest quantity is assured by the use of

"The Machinery That Never Disappoints."

We make every machine used for the manufacture of clay products.

⁂

THE AMERICAN
CLAY-WORKING
MACHINERY CO.,
BUCYRUS, OHIO.

"THE MACHINERY THAT NEVER DISAPPOINTS"

The American Clay-Working Machinery Co.,

BUCYRUS, OHIO.

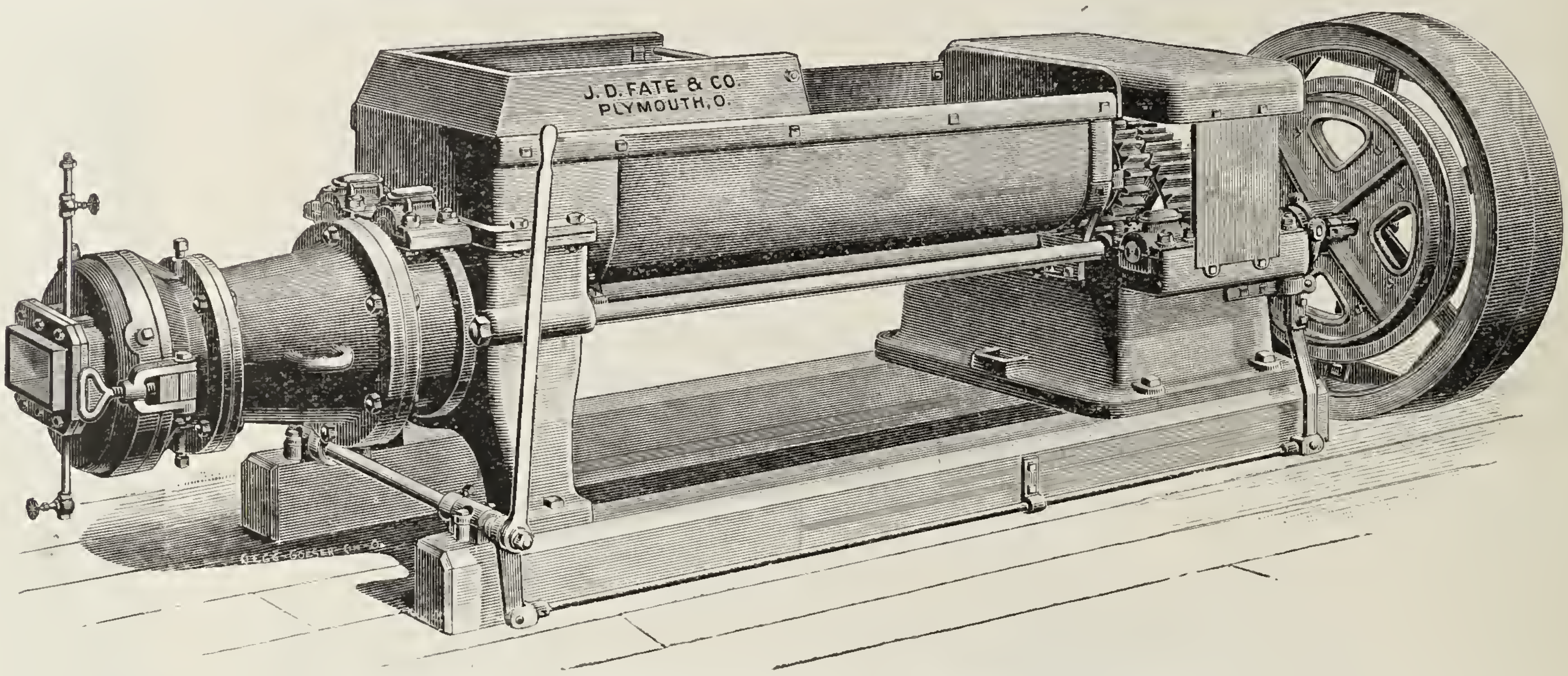
J. D. FATE & CO.,

Manufacturers of

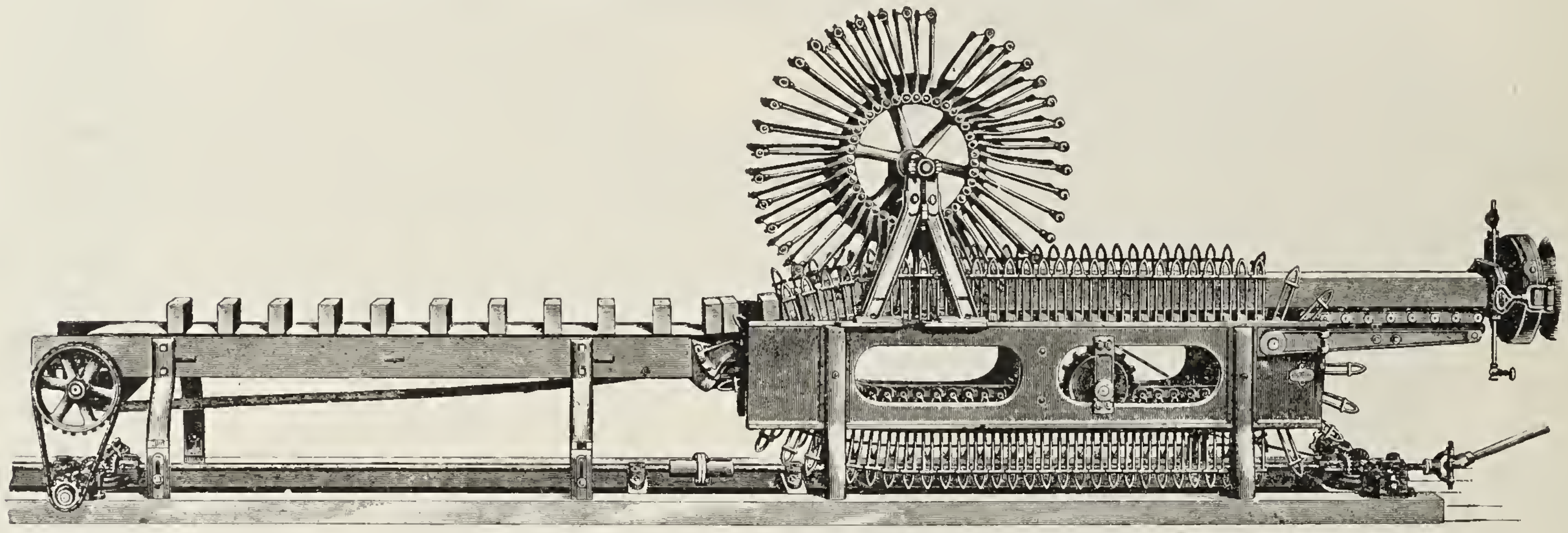
BRICK AND TILE MACHINERY.

PLYMOUTH, OHIO.

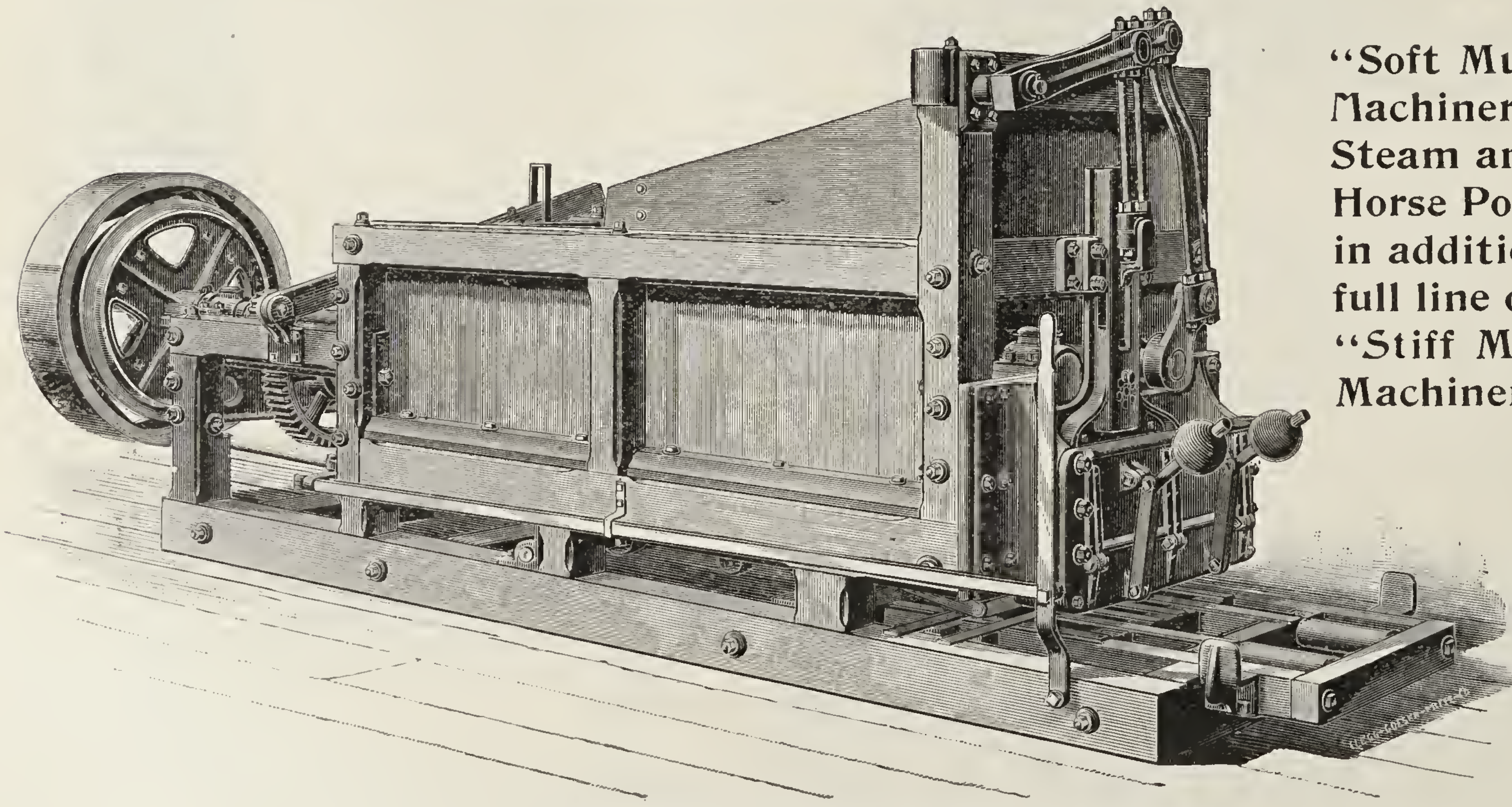
Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.



"HUMMER" COMBINED PUG MILL AND BRICK MACHINE.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.



"ADVANCE" SOFT MUD BRICK MACHINE.

"Soft Mud" Brick
Machinery, both
Steam and
Horse Power
in addition to our
full line of
"Stiff Mud"
Machinery.

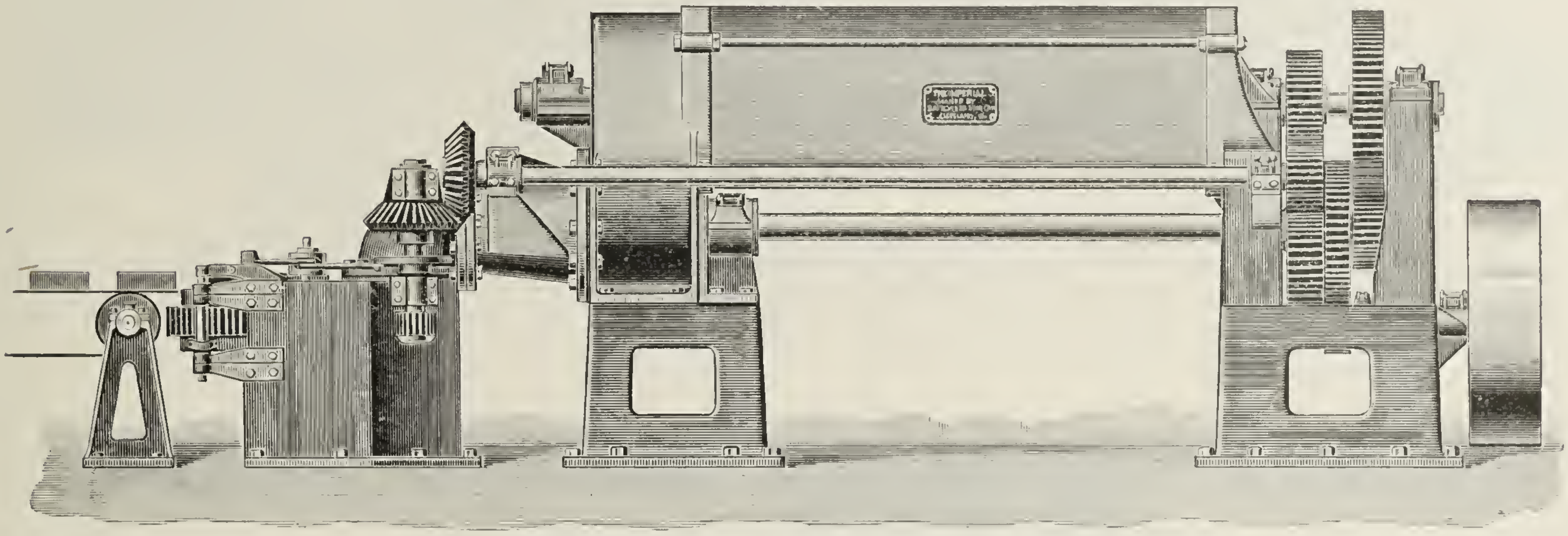
• •

ASK
FOR
CATALOGUE
AND
PRICES.

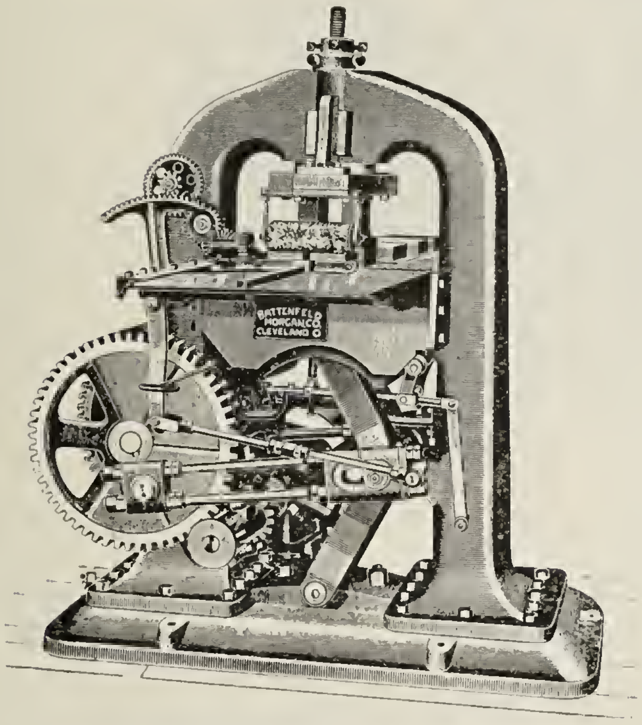
• •

Our "Imperial" Combination Brick Machine.

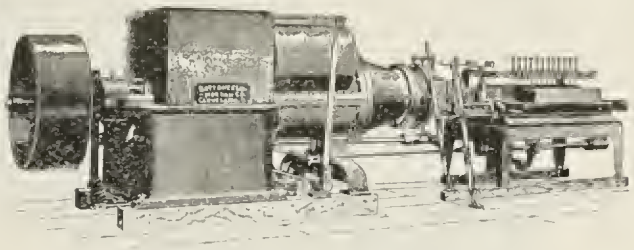
COMBINING PUG MILL, MACHINE AND REPRESS.



Capacity 30,000 per Day.

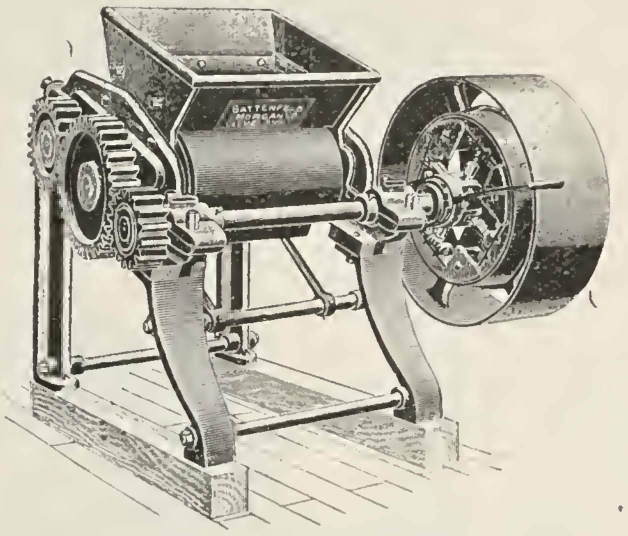


DOUBLE DIE REPRESS.

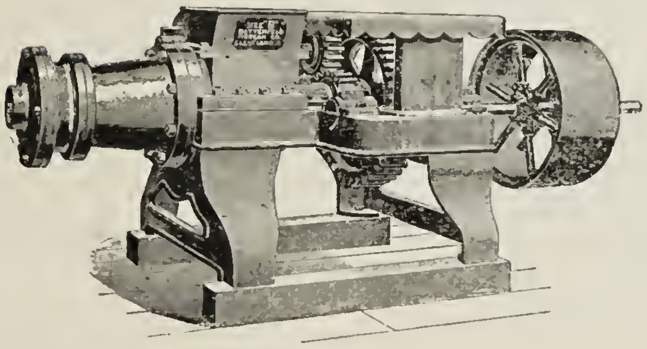


SIZE "AA." MACHINE.
Capacity 75,000 Brick per Day.

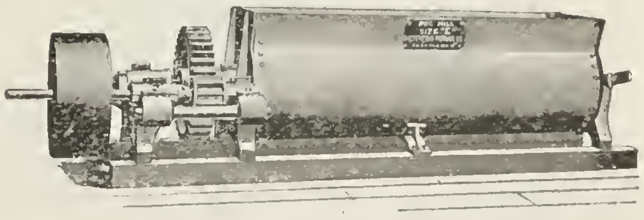
Write us
for
Catalogs,
Prices,
or any
Information
in regard
to our
Machines.



TWO ROLL CRUSHER, SIZE "A."



SIZE "B" MACHINE.

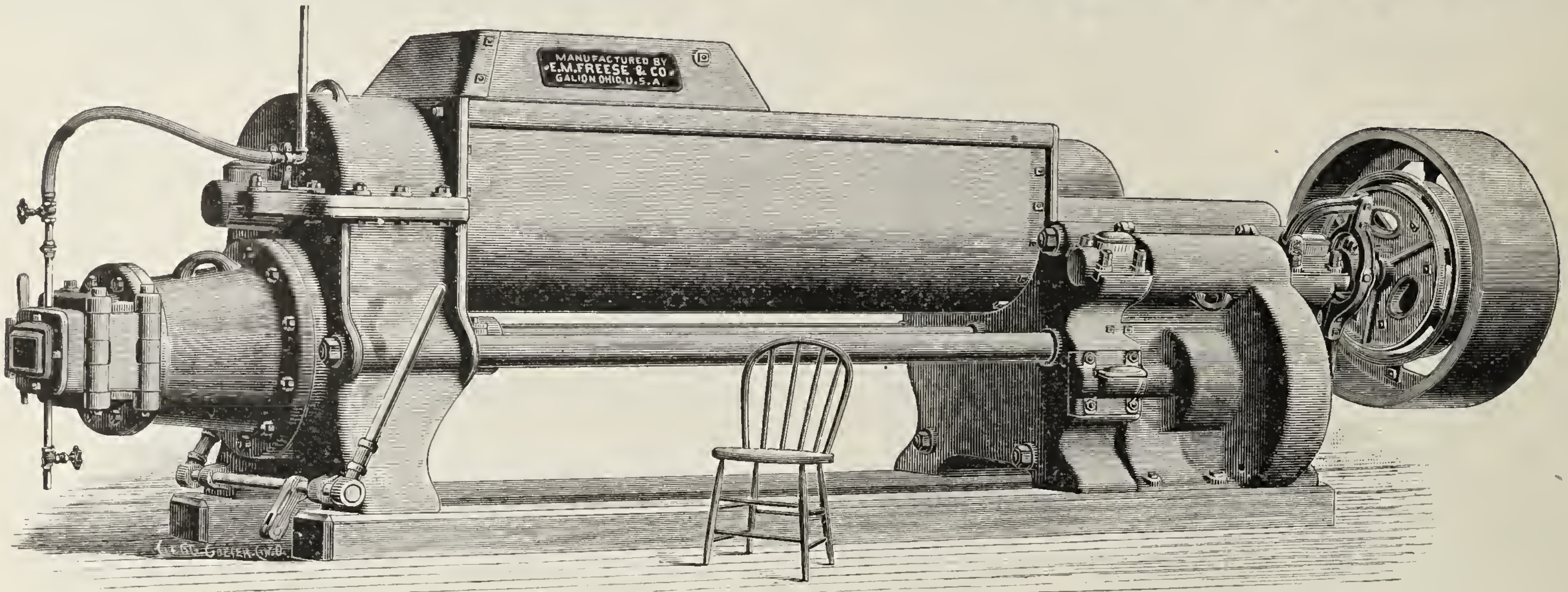


PUG MILL, SIZE "U."

The BATTENFELD-MORGAN CO.,

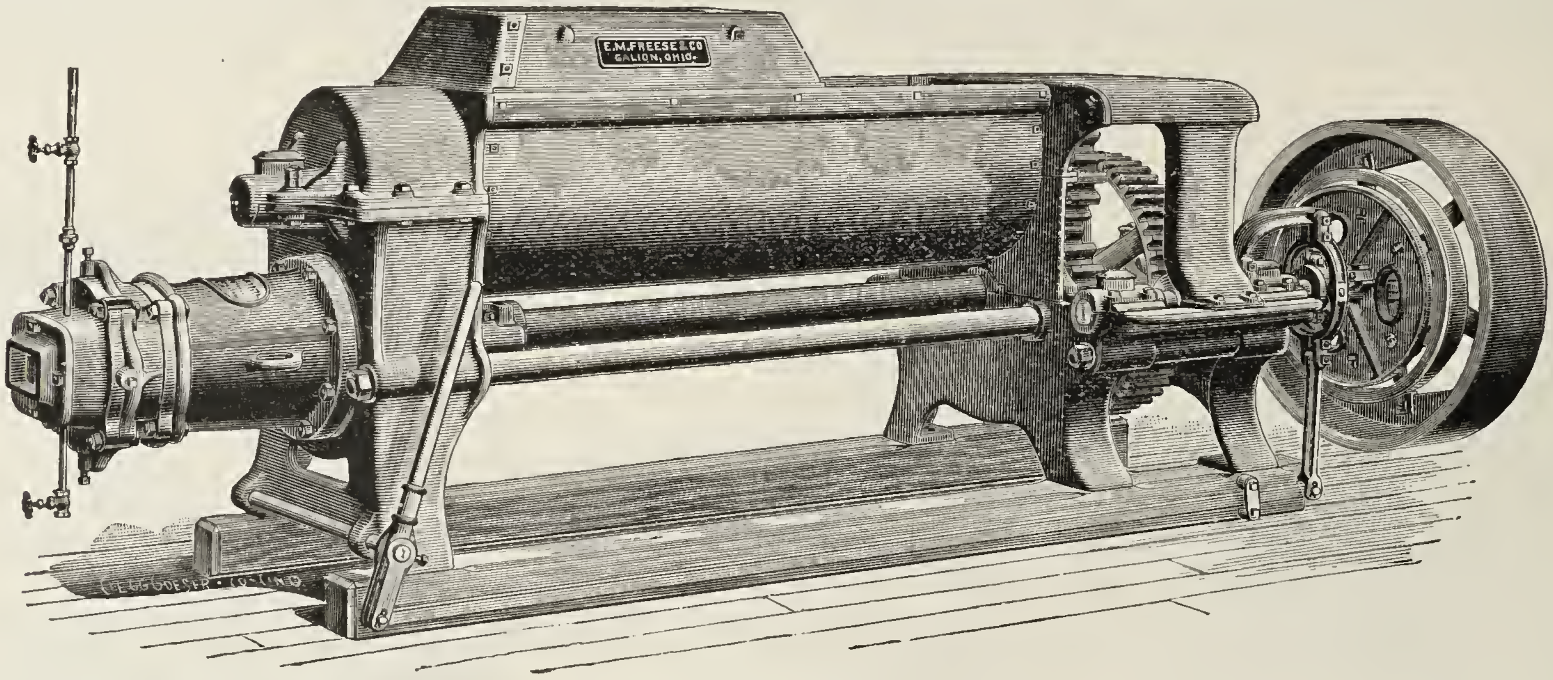
226-236 Abbey Street, CLEVELAND, OHIO.

The Original Union Brick Machines


MANUFACTURED BY
E.M. FREESE & CO.
GALION OHIO, U.S.A.

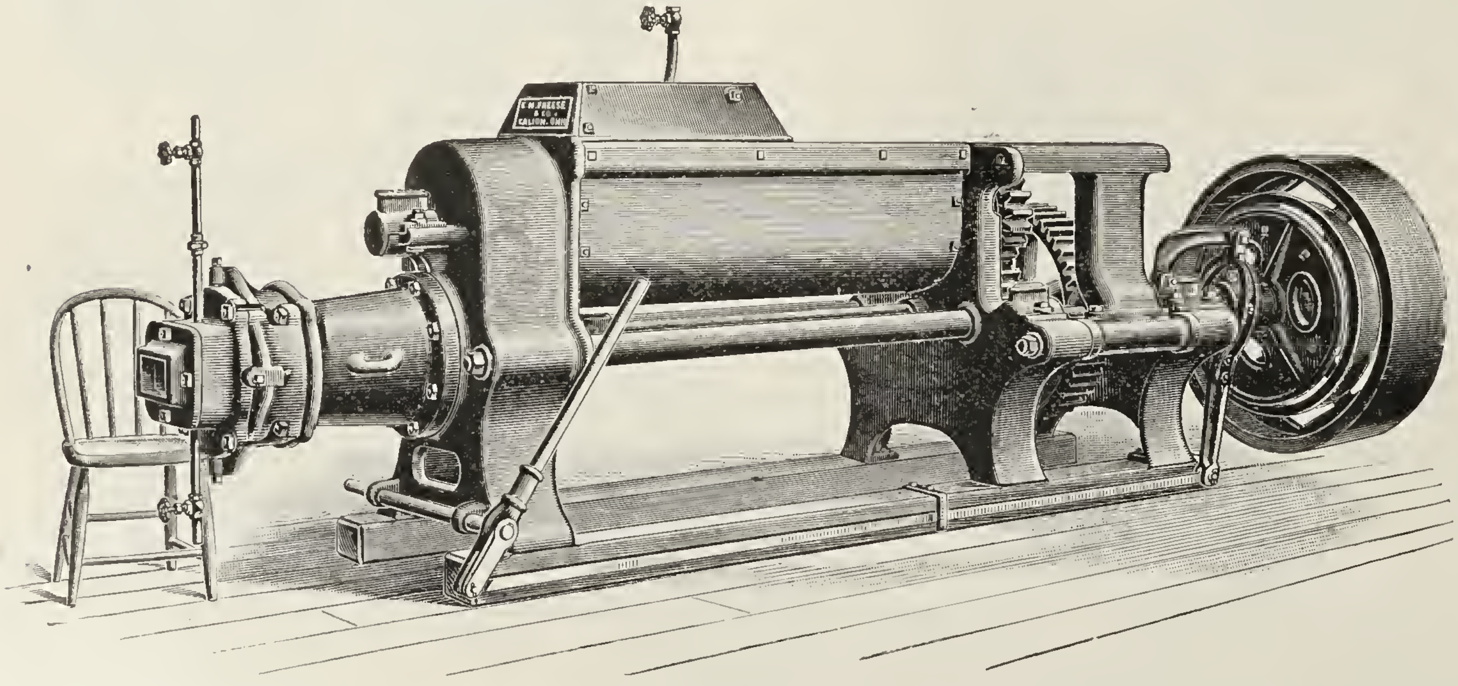
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE·

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

OUR LINE OF

Clay Working Machinery

FOR 1899.

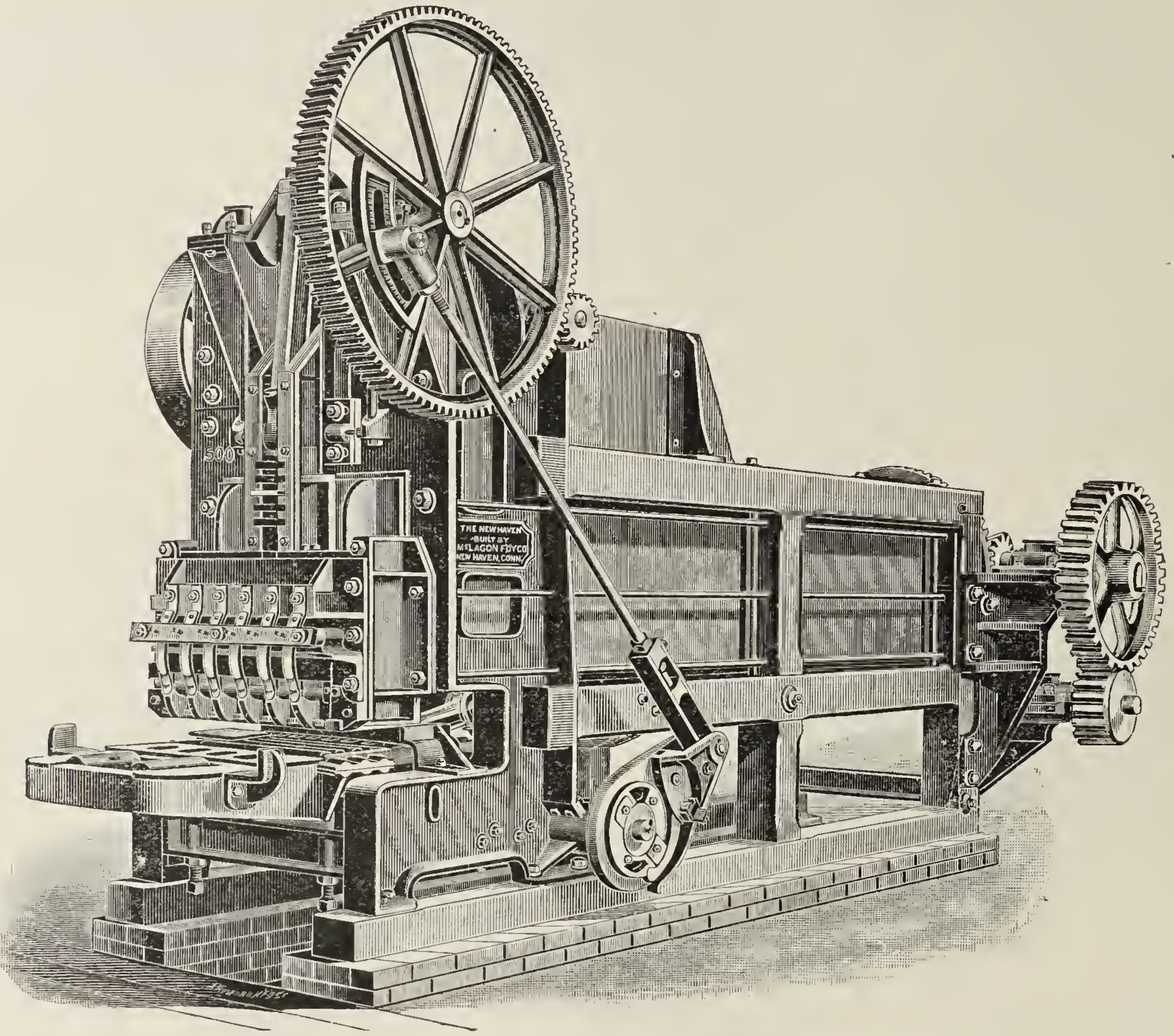
Horizontal Brick Machinery.
Vertical Brick Machinery.
Mold Brick Machinery.
Automatic Brick Cutting Tables, (Side cut.)
Automatic Brick Cutting Tables, (End cut.)
Semi-Automatic Brick Cutting Tables.
Board-Delivery Cutting Tables.
Cutting Tables with Sander Attached.
Hand Power Cutting Tables.
Power Re-Presses.
Hand Brick Presses.
Vertical Tile Machinery, (For Brick also.)
Automatic Tile Cutting Tables.
Hand Power Tile Cutting Tables.
Disintegrators, (Five Sizes.)
Stone Extracting Clay Crushers, (Two Sizes.)
Dry Pans, (Three Sizes.) Pug Mills.
Winding Drums
Conveyors and Elevators.
Dumping Cars. Engines and Boilers.

WRITE FOR INFORMATION.

H. Brewer & Co.,
Tecumseh, Mich.

Another "New Haven" Record.

Three Seasons without Repairs, Except a few Tempering Knives.



HOLYOKE, MASS., October 18, 1898.

THE EASTERN MACHINERY CO., New Haven, Conn.

Dear Sirs:—In reply to your inquiry we can honestly say that your brick machine **has given entire satisfaction**, and we cheerfully recommend it to all brick manufacturers.

This is our **third season** with this machine and **we have had no repairs** except the furnishing of knives for shaft during this period.

Yours respectfully,
DANIEL O'CONNELL'S SONS.

We Have Received Lots of Just Such Replies.

The Eastern Machinery Co.,

NEW HAVEN, CONN.

DO YOU WANT THE

BEST BRICK DRYER?

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel. It is a fuel saver and hence a money maker.

If you want the best and most economical brick dryer don't fail to get our prices. If you want a cheap dryer, its no use to write us for we don't build that kind.

◆

Read what H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE: 60TH AND HAVERFORD STS. TELEPHONE 147, W. P.

H. C. CARROLL & SONS,

Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS:
57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country. Yours respectfully,

H. C. CARROLL & SONS.

◆

The Cummer Clay Dryer is now in successful operation at many places in the United States. Like our brick dryer it is fully guaranteed to perform its work in the most effective manner possible and in any desired capacity. The **Cummer Dryer** succeeds where others fail. It will afford us pleasure to demonstrate its superiority over all other dryers.

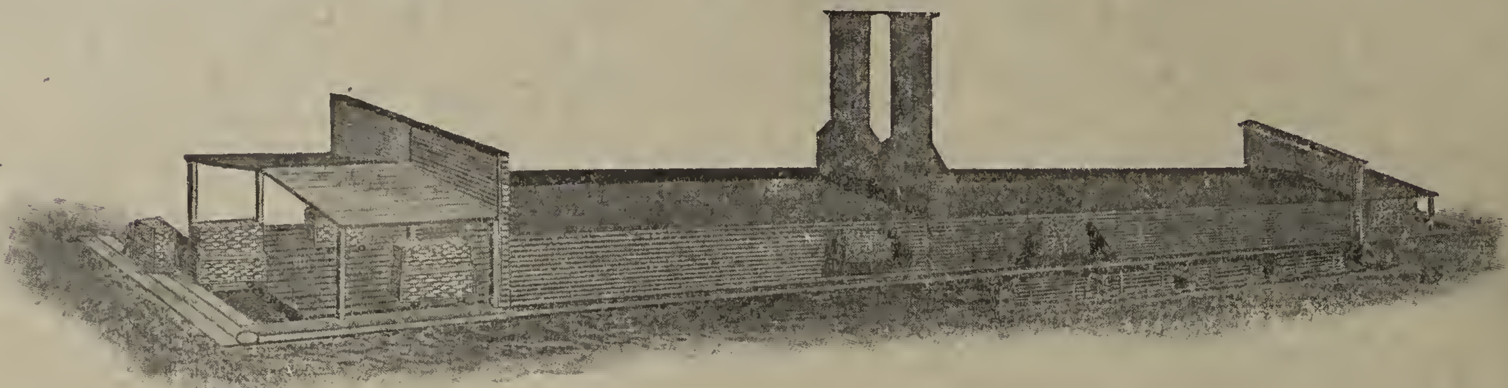
IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell you troubles to"

The F. D. CUMMER & SON CO.,

CLEVELAND, OHIO.

A. F. BARRON, Patentee and Builder of

The Chicago Iron Clad Dryer and Barron's Tender Clay Dryer.



THE BARRON TENDER CLAY DRYER.

This is a practical arrangement for drying all tender clay products that requires very careful drying. Each tunnel is divided into two chambers, the front being the preparatory, or tempering room, the rear the finishing chamber.

The air of tempering room can be maintained at any desired temperature and impregnated with necessary moisture to hold texture of clay products in uniform condition from centre to surface while process of setting, solidifying and warming up is progressing—preparatory for finishing course through rear chamber.

A. F. BARRON,
Successor to WOLFF DRYER CO.,
Room 303, 358 Dearborn Street, CHICAGO, ILL.

Now is the Time to Place Your Order for a Dryer.

INVESTIGATE THE CLAIMS MADE FOR The "A. B. C." Progressive Brick Dryer.

Send for Catalogue.

SATISFACTORY OPERATION, ECONOMY OF POWER.

Side and End-Cut Brick. Tile from 3 to 12-inch.

New London Tile and Brick Factory.
Capacity 20,000 Brick per Day.
C. E. MAGERS, Proprietor.

New London, Ia., December 31, 1898.

AMERICAN BLOWER CO., Detroit, Mich.

Gentlemen:—The A. B. C. Dryer I put in this fall is doing good work for me.

I am running right along and find your dryer to work perfectly and very economically as to power and steam.

The heating and drying capacity seems to be unlimited and it is very easy to regulate. It does better work and more of it, and cheaper than anything I ever saw.

Wishing you a prosperous New Year, I remain,

Respectfully yours,

C. E. MAGERS.

AMERICAN BLOWER COMPANY, DETROIT.

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THE CLAY WORKER
A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS.
INCLUDING BRICK TILE TERRA-COTTA SEWER PIPE POTTERY ETC.
T. A. RANDALL & CO. PUBLISHERS.
CHANDLER SC. INDPLS.

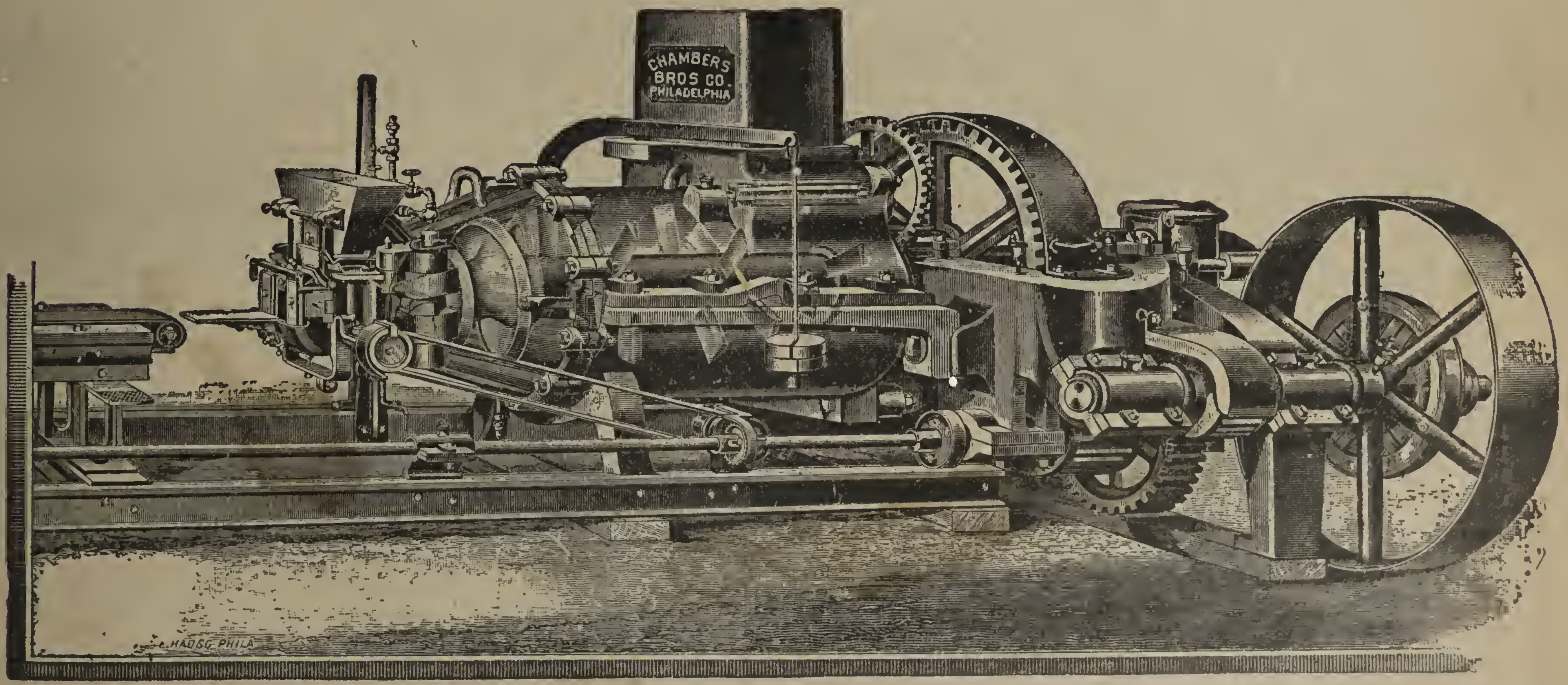
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXI, No. 2. INDIANAPOLIS, IND., FEBRUARY, 1899. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

PHILADELPHIA, PA.

J. E. EASTES, Chicago Agent,
171 South Canal Street.

See Pages 189 and 207.

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WE BUILD a full and complete line of **Steel Dryer** and **Dump Cars** and believing that the users of these goods are fully convinced, many of them by bitter experience, of the fallacy of using the cheap cars with which the market is flooded, we confine ourselves exclusively to the building of strictly high-grade cars, to stand the rough usage to which they are necessarily subjected. However, the equipment of our plant enables us to name extremely low prices upon Cars of any description and to make prompt delivery of any orders entrusted to our care. We respectfully solicit your inquiries.

CLEVELAND CAR CO.,
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Mention the Clay-Worker

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PERFORATED SHEET STEEL FOR CLAY SCREENS
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Is an All Iron and Steel Brick Machine with

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IN CONSTRUCTION,
DURABLE
AND . . .
POWERFUL.

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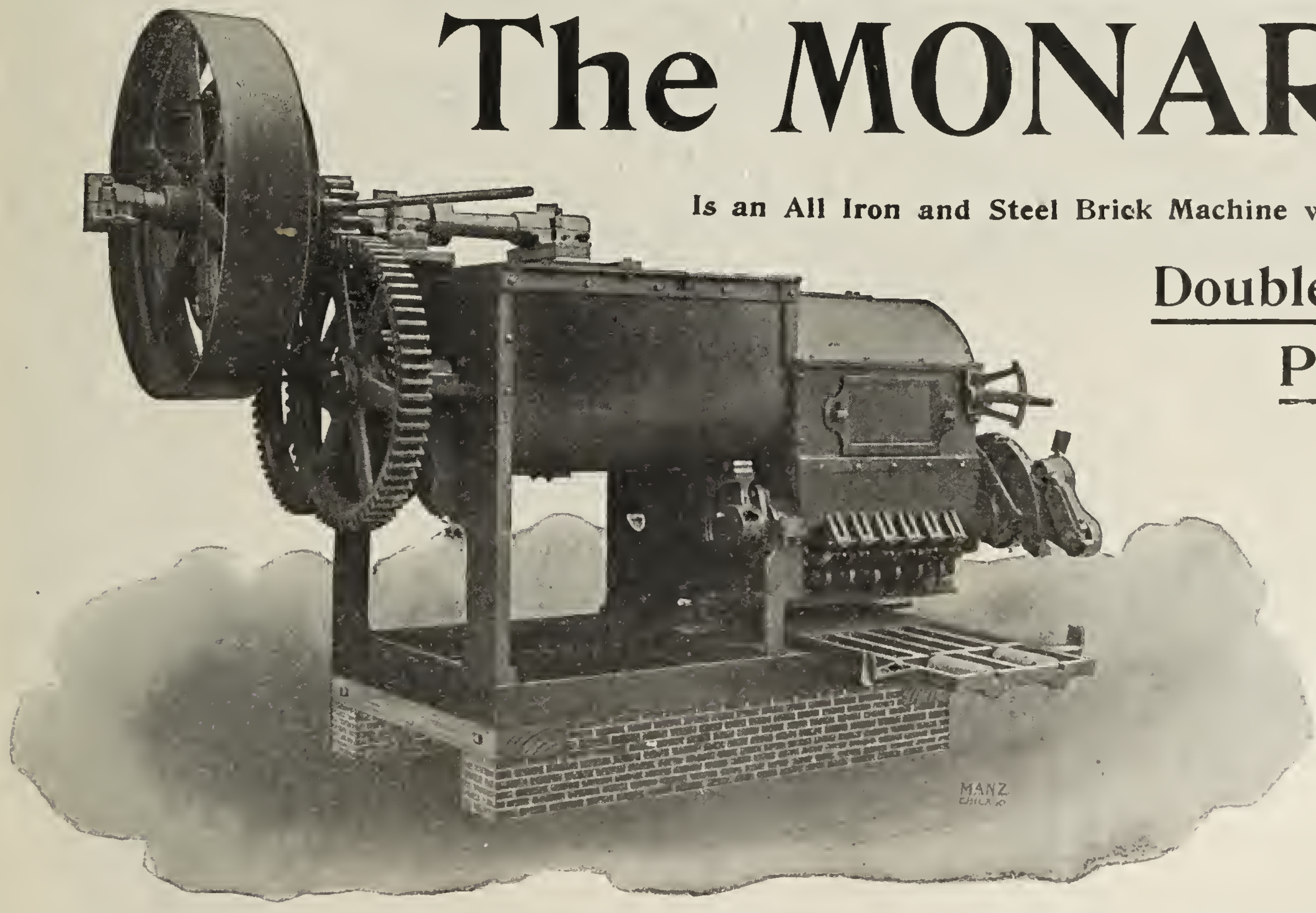

Every working part stands open to view both front and rear. It is a World-Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for 1898 Catalogue.

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America's Greatest Brick Machine

A Straight Offer.

The Body Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

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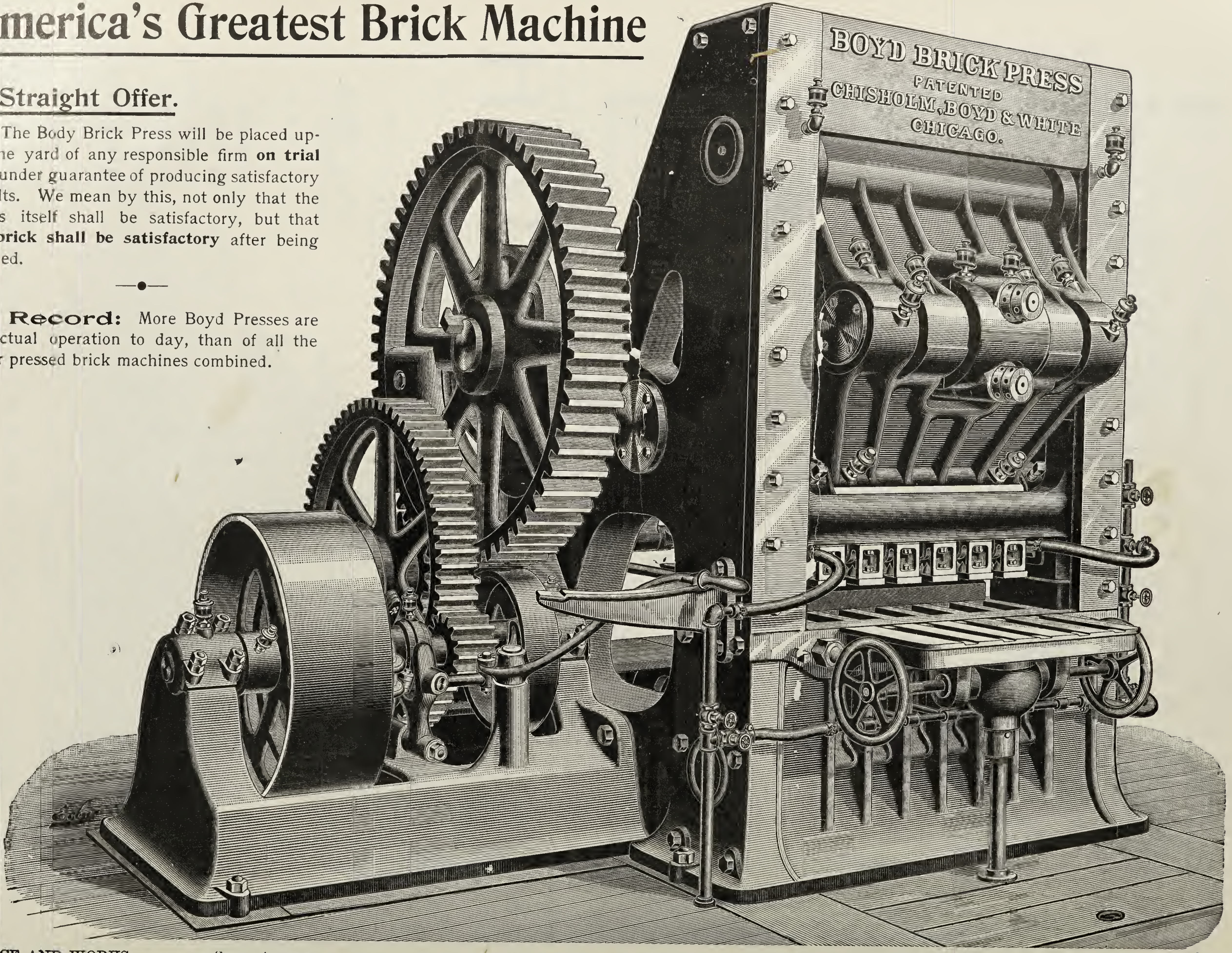
Its Record: More Boyd Presses are in actual operation to day, than of all the **other** pressed brick machines combined.



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The Survival of the Fittest.

THE inexorable law of the "Survival of the Fittest" is well illustrated in the continued success of the **SIMPSON BRICK PRESS.** It was one of the first successful dry presses manufactured in America and from its introduction has held a leading place. The improved **SIMPSON PRESS** is a thoroughly up-to-date machine and embodies many excellent features, that make it invaluable to the brickmaker who wishes to make the best quality of Press Brick—at moderate cost.

We make a specialty of complete equipments including every device required on a modern press brick plant. Don't fail to get a list of our new improved Challenge Clay Preparing Machinery.

◆

We Manufacture

Simpson Challenge Specialties.

◆

Challenge Screen Conveyor,
Challenge Oscillating Roll Crusher,
Challenge Impact Pulverizer,
Challenge Clay Steamer,
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FULL
PARTICULARS
CHEERFULLY
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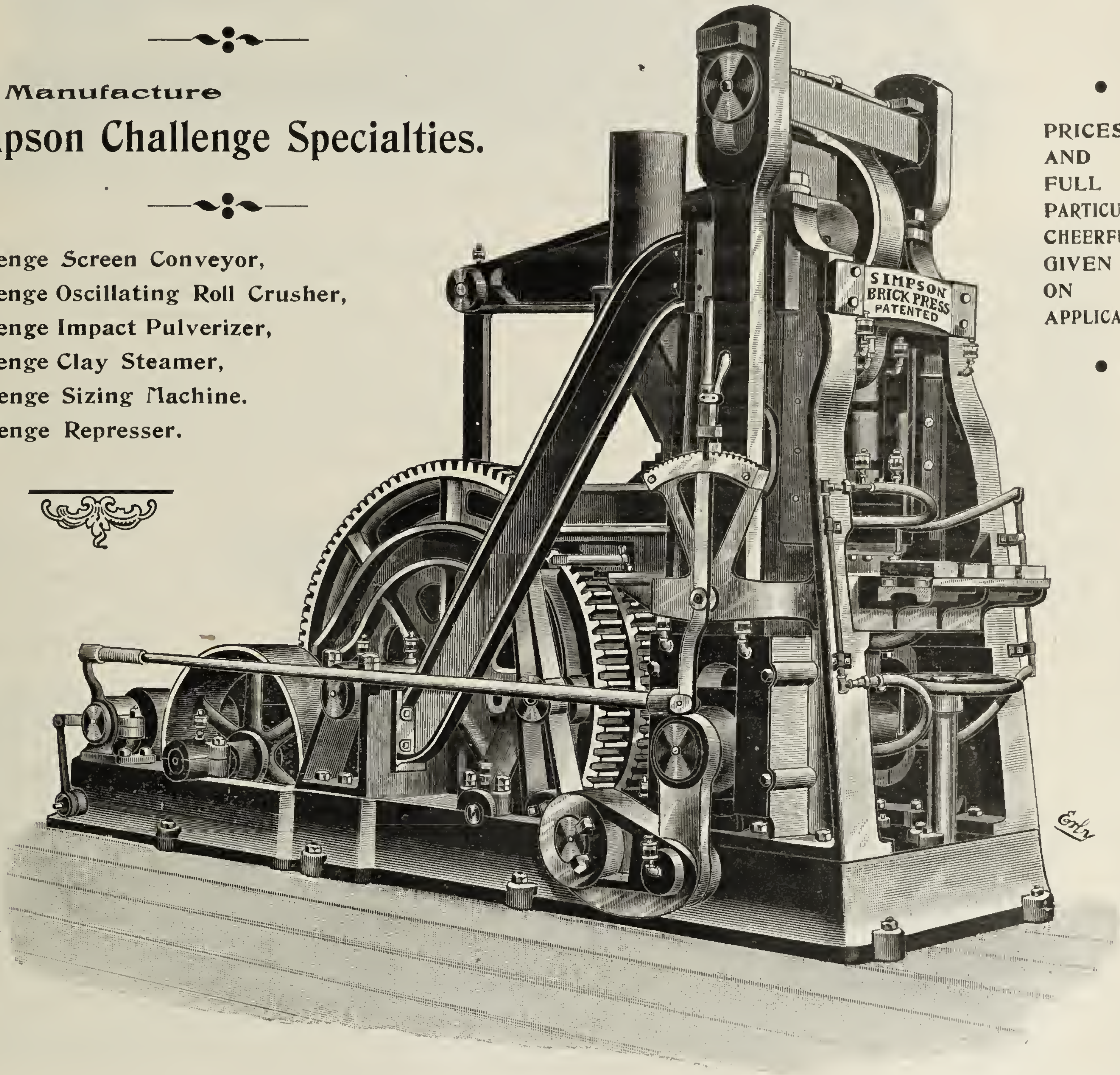

Simpson's 4-Mold Brick Press, Model AA, New Style. BUILT IN 4 SIZES.

◆

SIMPSON MACHINERY CO.,

OFFICE AND WORKS: 77th and Jackson Ave. (FORMERLY STORMS AVE.)
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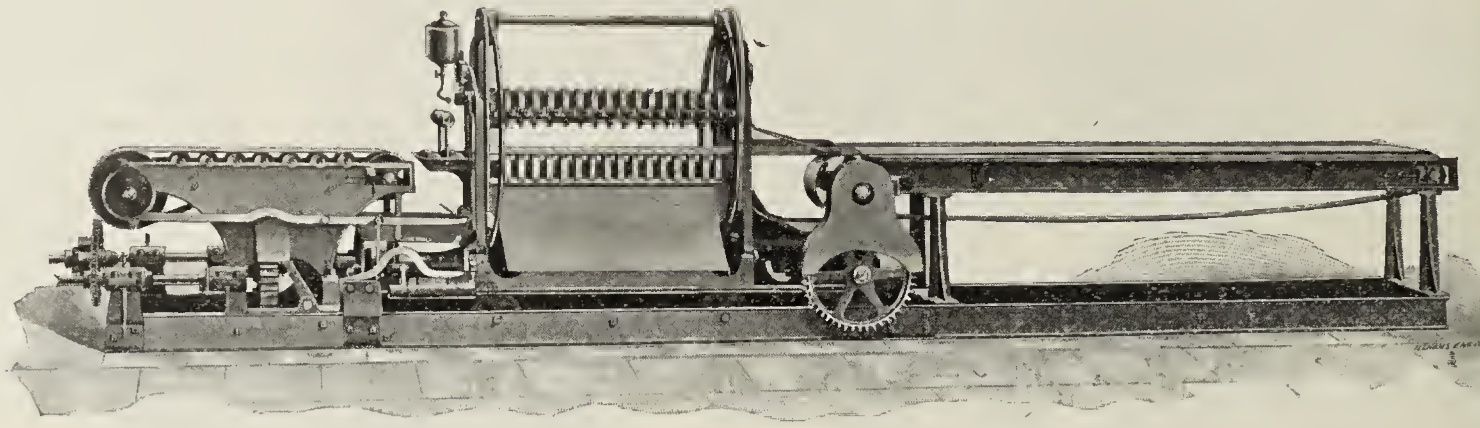
The Wonder Clay-



Cunningham's Improved Combination End and Side Cut Automatic Brick Cutter.

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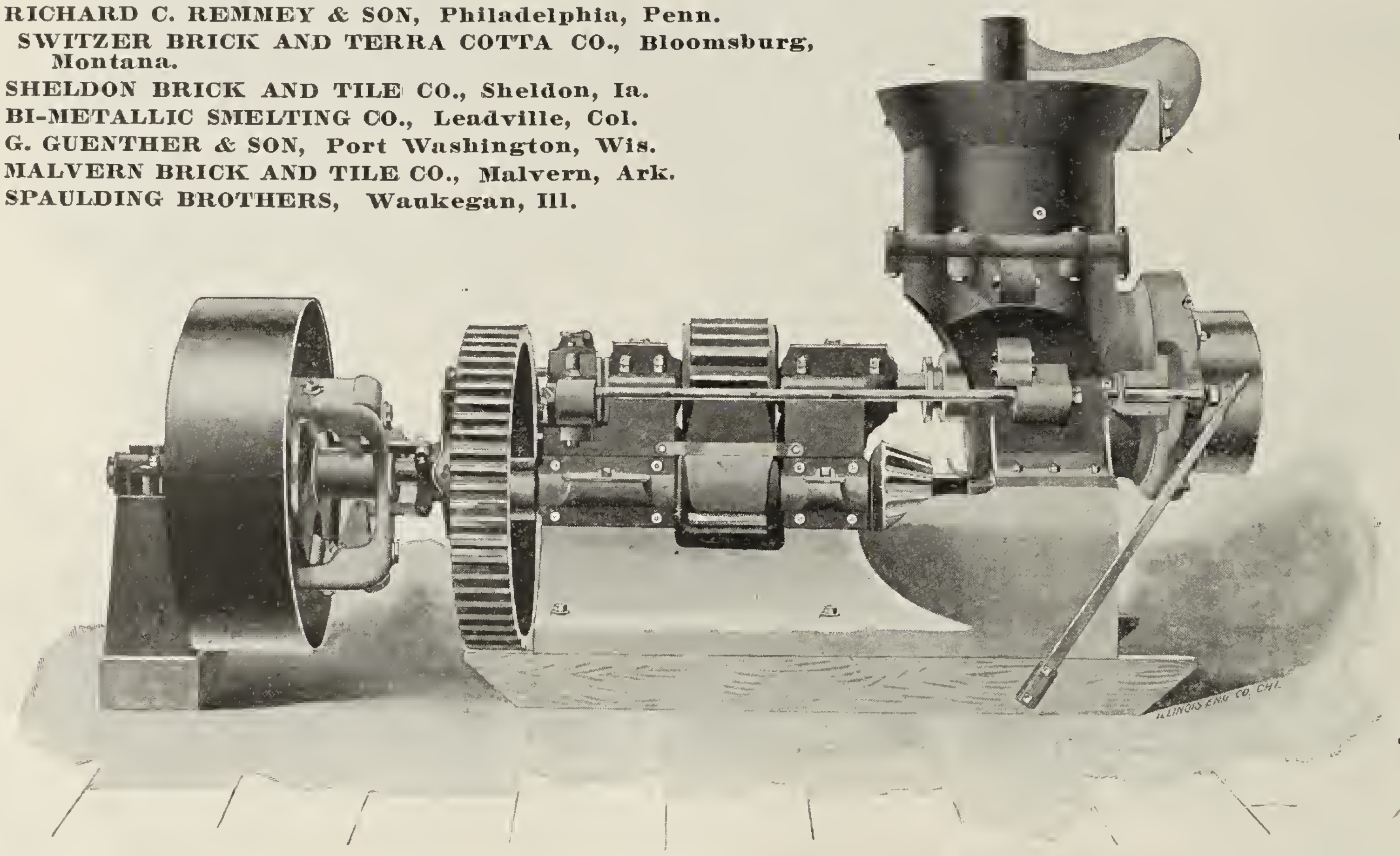

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Them
Why
Not
You
As
Well.**

The Wonder Tile Machines, made in two sizes.

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Chicago Brick Machinery Co.,
CHICAGO, ILL.**

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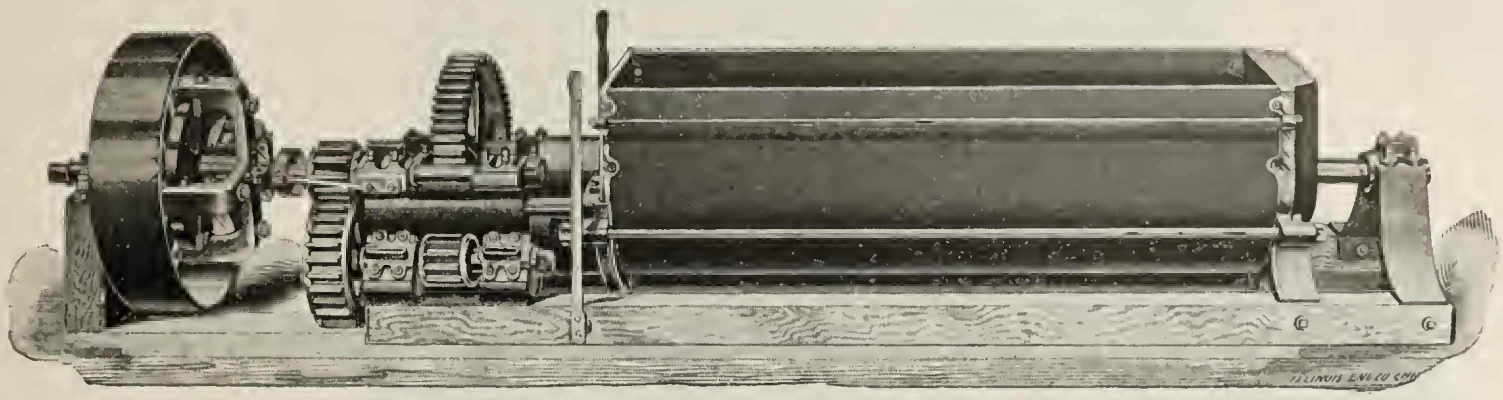
Working Machinery

And a Few of its Friends.



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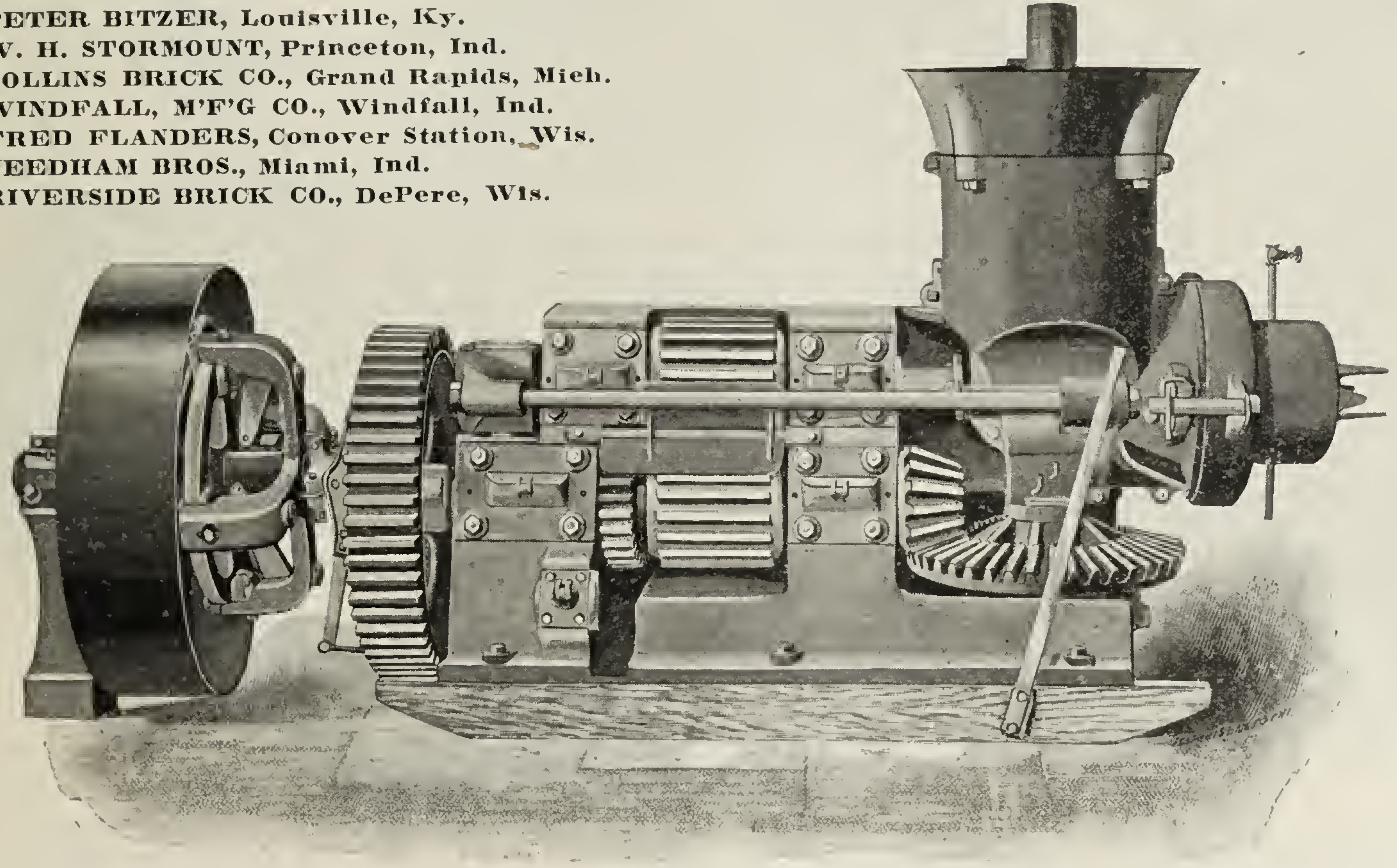

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Machinery,
Don't
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to get
Our
Prices.

Wonder Brick Machines, made in four sizes, with capacity ranging from 20,000 to 100,000 brick per day.

MANUFACTURING CO.,

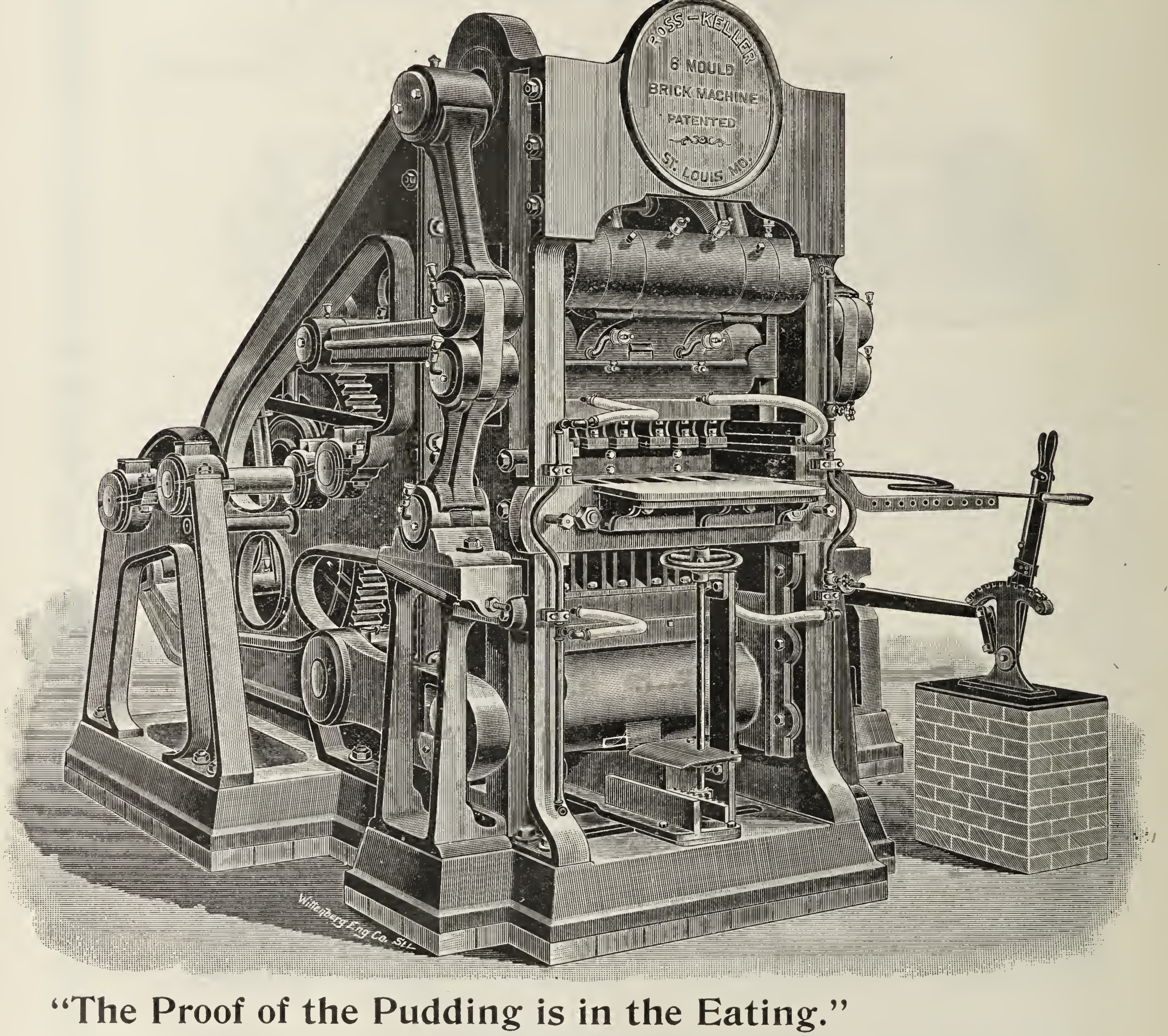
Frankfort, Indiana.

The Latest Improved

Ross-Keller TRIPLE·· PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

——BRICK SET IN KILN DIRECT FROM MACHINE.——



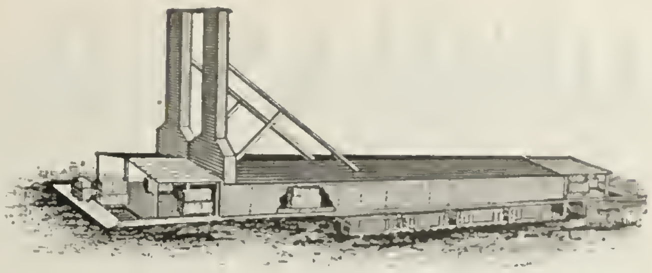
"The Proof of the Pudding is in the Eating."

The Ross-Keller Brick Machine is not "**pronounced**" by the United States Government the highest development of the "**ART**" of Brickmaking Machinery. But the United States Government **did** on the 29th of October 1898, "**pronounce**" to the World that the **Ross-Keller Machine** was the best "Development" to be used by it for the Manufacture of forty million pressed brick to be used in the construction of the United States Penitentiary at Ft. Leavenworth, Kan., as was evidenced on that day when bids from all of the manufacturers of Pressed Brick Machinery were opened, and after a thorough examination of each machine in practical operation, did purchase at the highest bona-fide bid the **Ross-Keller Machine.** For particulars we take pleasure in referring you to W. S. Eames, Esq., U. S. Supervising Architect, St. Louis, Mo., and to the Hon. J. W. French, Warden U. S. Penitentiary, Ft. Leavenworth, Kan. With this machine we give an unconditional guarantee for two years against breakage. If you want the best write to us for price and full particulars. Press is guaranteed for two years against breakage.

Ross-Keller Brick Machine Company,

915 Holland Building, **——ST. LOUIS, MO., U. S. A.**

National Bank OR Coal Bank,



Chicago Iron Clad Dryer.

Is the Vital Question.

Chicago Brickmakers prefer depositing with the former. The accompanying letter from one of Chicago's leading brickmakers kindly offering the secret to all Brother Brickmakers seeking for light. A perusal of this letter will illuminate the fact that management and proper appliances determines which bank receives the deposit.

TELEPHONE MAIN 4132.

LABAHN BRICK CO.,
MANUFACTURERS OF
Building Brick.

YARD: Lansing, Ill., on Panhandle R. R.
Box 408, Builders' and Traders' Exchange.

OFFICE: 159 LaSalle Street, Room 97.

CHICAGO, February 1st, 1899.

MR. A. F. BARRON,
Successor to WOLFF DRYER Co., Chicago.

Dear Sir:—Your favor of January 30th, received. In replying to same, regret that I am unable to furnish you with the cost of fuel for drying our brick. Our steam power is so situated that we are unable to separate or divide it up so that the machinery and dryer could be run separately.

The best that I can do for you in this direction is to furnish the amount of steam power used to run our entire plant and fuel consumed for generating steam and burning brick.

The capacity of our plant averages one hundred and thirty five thousand (135,000) per day in the years business.

The entire plant in run economically with three boilers, 125 horse power each. These boilers furnish the necessary steam required to run all machinery for making the brick, and likewise supplying the live steam which runs the dry house, drying our entire output, and all other purposes where steam is used about the premises. We are using Brazil block (soft coal) for generating steam, and this coal and wood for firing the kilns. The average cost per thousand for the entire product is seventy cents, for making, drying and burning. Our dry house has been in active service for the past six years. Since adding your improvements three years ago, in order to meet the increased capacity of our machinery, it has responded to all demands upon it Winter and Summer without diminution of capacity or perceptible difference in consumption of fuel. It is therefore needless to say that we are well pleased, and in fact should be more than satisfied, as the dryer turns out fifty per cent more brick than your contract specified.

Possibly these statistics may be of value to some brother brickmaker and yourself personally. We would therefore say to you that our plant and our books are open and free for inspection by all brickmakers seeking for light upon this important subject.

The foregoing is a just tribute to the merits of your Iron Clad Dry House and honorable methods of carrying out agreements. Our dry house is a four tunnel, sixteen track dryer, 112 feet long.

Yours very truly,
LABAHN BRICK CO.
John F. Labahn, President.

THE BARRON TENDER CLAY DRYER.

We build dryers to meet the peculiarities of the various clays. Innformation furnished.

A. F. BARRON,

Successor to WOLFF DRYER CO.,
Room 303, 358 Dearborn Street, CHICAGO, ILL.

UNBIASED TESTIMONY

IS THE KIND THAT COUNTS.

What a manufacturer says about his own product may sometimes be open to doubt. It would be a weak sort of man who didn't "stick up" for his own handiwork. But what **others** say—that's another story. We are willing that

The Standard

Brick and Tile Drier

Should be judged by its record as made up by users. On this sort of testimony—the kind given below—"we rest our case."

Ensley Brick Co., Ensley, Ala.

Ensley, Ala., December 9, 1898.

The STANDARD DRY KILN CO.,
Indianapolis, Ind.

Gentlemen:—We are very much pleased with your Drier—it does even better than you guaranteed.

This is very gratifying to us as our first experience with Driers was very discouraging; in fact, a failure both as to drying and handling our material. The great mistake we made was in considering a proposition from and awarding the contract to a party who made us a lower price than yours, on our first Drier. In buying the second time we did not consider a bid from the first builder at all. Now we see the difference. There is no comparison between the two Driers, neither in equipment, workmanship or system.

Respectfully,
ENSLEY BRICK CO.,
H. L. Finkler, Sec'y.

Indianapolis, Ind., Nov. 3rd, 1898.

The STANDARD DRY KILN CO., Indianapolis, Ind.

Gentlemen:—The eleven track Steam Drier you put in for us at our Martinsville plant has been in use nearly one year, during which time it has been subjected to numerous and trying tests. Beginning as we did in the Winter with the clay wet and sloppy, and the shale full of frost, our soft mud brick entered the dry house cold and clammy. Under the scientific yet common sense method of distributing the heat and nature's own way of carrying off the moisture, our brick came from the Drier, sound and thoroughly dried and free from checks or fracture.

We dry our soft mud shale brick in 24 hours and our brick made from clay in 48 hours. The Drier is easily controlled, in fact it runs itself with no expense so far, for repairs or renewals; all that is required is steam sufficient to keep the temperature at 120 degrees at the receiving end, and about 165 degrees at the discharging end.

The cars we purchased of you with Cage Roller Bearings and well supported and braced steel racks, without doubt are far and away the best and most practical we have seen or tried. In fact the Drier with its outfit is to us an agreeable surprise, in the matter of durability, practical use and expense on account of repairs.

Yours very truly, THE ADAMS BRICK CO.,
J. C. Adams, Pres't.

The STANDARD Is the Drier that does not disappoint. It invariably does all and a little more than is claimed for it. It satisfies in every instance.

Our Catalogue and much more "Unbiased Testimony" can be had for the asking.

The Standard Dry Kiln Co.,

186 South Meridian Street. ***INDIANAPOLIS, IND.***

THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. XXXI. INDIANAPOLIS, IND., FEBRUARY, 1899. No. 2.

OFFICIAL REPORT.

Proceedings of the Thirteenth Annual Convention of the National Brick Manufacturers' Association of the U. S. of A.

THE FIRST SESSION of the Thirteenth Annual Convention of the National Brick Manufacturers' Association met in the Assembly Hall of the Great Southern Hotel, at Columbus, O., Feb. 7, 1899, and was called to order at 2:30 p. m. by Vice President L. J. Howard, of St. Louis, Mo. It was, indeed, a pleasant sight—the gathering together of so many earnest and enthusiastic clayworkers, each intent upon forwarding the interests of the craft. The Convention Hall was large, well lighted and comfortable, despite the extreme cold weather which prevailed throughout the week. The hall has a seating capacity of nearly three hundred; every chair was taken, and a number stood at the rear of the hall during this session. A number of ladies were present, wives and relatives of the members, who seemed much interested in all the proceedings.

Vice President Howard: Gentlemen, the time has arrived to open this Convention. Following in the footsteps of our worthy predecessors, and acknowledging the Supreme Power of the Universe, I take pleasure in introducing the Rev. Washington Gladden, of Columbus, O., who will now kindly invoke the Divine blessing upon us.

L. J. Howard, First Vice-President, St. Louis, Mo.

—The Opening Prayer.—

Rev. Washington Gladden: Our Heavenly Father, we beseech Thee that Thy blessing may rest upon this Convention and those who are gathered here to take counsel with one another concerning the work that is given them to do. We bless Thee that we are permitted to be co-workers with Thee. We thank Thee for the example of Him who came into this world and spent thirty years of His life as an humble worker, testifying, "My Father worketh hitherto, and I work." We beseech Thee that Thou wilt help us to understand that whatever honest work we are called on to do is sacred work, is divine work, and we beseeech Thee that some sense of the dignity and sacredness of our calling may take possession of our minds and hearts. May we realize that all we do to develop the wealth of this world is only carrying into effect Thine own great purpose. Help us so wisely and so honestly and so benevolently to work that we shall be able to fill the world with plenty. Now, may Thy blessing abide upon these, Thy servants; give them wisdom for all the conferences of the afternoon and all their sessions, and grant that Thy spirit may direct and encourage them in all lawful work which they shall undertake. May Thy blessing rest upon their families, from whom they are absent, upon all interests dear to them. Wilt Thou keep us all, sanctify us to do the work Thou hast given us to do, and, when our work is done may we abide in Thy kingdom, we ask for Thy love's sake. Amen.

Vice President Howard: The Secretary will announce the order of business.

Secretary Randall: The next in order, according to the programme, is the enrollment of new members and roll call. The latter is hardly practicable because the list has not been completed. I suggest that it be omitted. Taking this by consent, the next in order is the President's address. I am very sorry to have to read a letter of regret from our worthy President, William Flinn, of Pittsburg. Brickmakers are proverbially politicians. President Flinn is a notable one, and is just now engaged in a fierce political conflict, being the head of the faction in the Pennsylvania Legislature now trying to defeat the reelection of Senator Quay. Mr. Flinn believes the conflict a righteous one, and is bending every effort to encompass the defeat of bossism as represented by Senator Quay. The contest has reached the crisis, and President Flinn feels that he cannot afford to leave his post of duty for a single hour, and so sends the following letter:

PRESIDENT FLINN'S REGRETS.

Dear Mr. Secretary:

Yours of the 31st ult. at hand. I very much regret my inability to be present at the annual Convention of the National Brick Manufacturers' Association.

The pleasure and education I received attending the meeting of the Association last year was of such a character that I have looked forward with pleasure to the meeting this year, but we have a great contest on in Pennsylvania—the election of a United States Senator—and I am Chairman of one of the Republican factions, which precludes me from doing anything else at this time other than looking after this contest.

Wm. Flinn, Retiring President, Pittsburg.

Kindly express my regrets to the members of the Association and tender them my sincere thanks for the acts of kindness they have extended to me.

Wishing that the Convention will be entirely successful, I am sincerely,
WILLIAM FLINN.

Pittsburg, Pa., Feb. 4, 1899.

Secretary Randall: It therefore devolves upon our First Vice President, Mr. L. J. Howard, of St. Louis, to take the gavel and preside over our deliberations. He will therefore deliver

The President's Address.

Vice President Howard: Ladies and gentlemen, in taking the chair to-day I must express regret that you are deprived of the pleasure of greeting our worthy President, William Flinn. While regretting his absence, I am not unconscious of the compliment you have conferred upon me. To those who I have had the pleasure of meeting in the past I extend hearty greeting. The new faces that I see around me show that the object of our coming together is none the less appreciated at this, our thirteenth, annual gathering than at our previous Conventions. It is, indeed, most gratifying to see so large an attendance. I bid the new members, one and all, a most cordial welcome, and express the hope that they will take an active part in all our work.

To our hosts, the citizens of Columbus, I express great pleasure in being privileged to meet in your beautiful capital city. (Applause.)

Secretary Randall: The next in order is the report of the Treasurer.

Treasurer Sibley: Before reading my report I would like to say that you all know that the proviso when I was elected was that in all my reports there might be some joke or some fun, and I must apologize that I must perpetrate a joke on our absent President, but as he is at the post of duty I hope he will appreciate it when he hears of it.

TREASURER'S REPORT.

To the Officers and Members of the N. B. M. A.:

Gentlemen—I hand you herewith a statement of receipts and disbursements since the last annual report.

It will, no doubt, be gratifying to you to learn that we have met all our obligations and carried to surplus account the sum of $28.30, which, though a small amount, is an index of the change of tide predicted by me at Pittsburg.

But such a condition of affairs was inevitable under the administration of a President who, the press reports say, does Quayl before the power of senatorial expansion and the shaking of the plum tree in the rich garden of Pennsylvania.

This leaves a balance in the treasury of $123.18, which will, no doubt, be greatly added to by new members coming in from Cuba, Porto Rico and the Philippines.

Four centuries ago Columbus came to the New World and opened up its vast possibilities, but we shall now see men from our new possessions come to Columbus, where Prof. Orton will open up to them the vast possibilities (or shall I say impossibilities) of the clayworking industry. Wishing the Association and all of its members a season of unprecedented prosperity. Respectfully submitted,
JOHN W. SIBLEY,
Treasurer National Brick Manufacturers' Association.

Receipts and disbursements account of the twelfth annual Convention of the National Brick Manufacturers' Association:

RECEIPTS.

Balance in treasury, account 1897		$94.88
Membership fees, 59 at $5, account 1898	$295.00	
Membership fees, 249 at $2, account 1898	498.00	
Sale of reports	46.80	
Total receipts, account 1898		$839.80
Total		$934.68

DISBURSEMENTS.

Paid Trunk Line Association attendant, per voucher	$17.00	
Paid Ohio State University scholarship, per voucher	250.00	
Paid for special telegrams, per voucher	12.25	
Paid for 1,000 programmes, mailing, etc., per voucher	29.00	
Paid for 500 copies annual report, per voucher	111.00	
Paid for stationery, post express, etc., per voucher	92.25	
Paid for Secretary's traveling expenses, per voucher	250.00	
Paid Assistant Secretary	50.00	
Total expenditures		$811.50
Balance in treasury		$123.18

RECAPITULATION.

Total amount collected, account 1898	$839.80
Total amount expended, account 1898	811.50
Surplus in treasury, account 1898	$28.30

Vice President Howard: You have heard the report. What shall we do with it?

E. M. Pike: I move it be accepted and placed on file.

Motion seconded by Mr. Eggers and carried.

Secretary Randall: The next is the report of the Committee on Revision of Constitution, of which Mr. Bloomfield is Chairman.

Mr. C. A. Bloomfield, New York city: Under the rule by which that committee was appointed, the report was to be first submitted to the Executive Committee, and, after they had acted upon it, it was to come before the Convention. The committee has met and decided to recommend certain amendments which it thought proper and for the best interests of the Association, but as it has been impossible to get the Executive Committee together, owing to the late arrival of trains, I would suggest that the matter go over until the next session, or until the Chairman of the committee will have a chance to meet the Executive Committee and act in accordance with their wishes.

Vice President Howard: Unless objection is made, I think it would be proper to give the committee further time. The next is the election and installation of officers.

Secretary Randall: I will say, in this connection, there are many strangers with us, all of whom we are very glad to see. For their benefit I would explain that the rule is, the vote shall be by ballot. As you all know, very frequently the rule is suspended and the Secretary authorized to cast the unanimous ballot. The first to be elected is the President, and nominations are now in order.

—Election of Officers.—

Mr. L. G. Kilbourne, Columbus, O.: The brickmakers of Columbus and vicinity selected as the emblem of their badge Progress leading the Brickmaker on to success, and we are proud to have among our members a man who evidently adopted this motto early in his career, for he has gone steadily forward and onward; he has worked early and late in the brickyard, machine shop and laboratory, and to-day is a thoroughly up-to-date brickmaker. He has not been content to keep this knowledge, gained by years of experiments and study, to himself, but he has been a regular attendant at the Conventions of this Association, and, as many of you here present can testify, has contributed some of the most valuable papers to the Association. I have the honor to nominate as President of the Association for the coming year Mr. Willard D. Richardson, of Shawnee, O. (Loud applause.)

Mr. D. V. Purington, Chicago: It gives me a great deal of pleasure to second the nomination of Mr. Richardson, and, if there are no other nominations, to move that the Secretary be instructed to cast the unanimous ballot of this Association for Mr. W. D. Richardson for President.

This motion was seconded by several and carried.

Secretary Randall: The vote has been cast.

Vice President Howard: I declare Mr. Richardson duly elected, and would ask him to come forward to the platform.

This Mr. Richardson did, and was introduced by Vice President Howard, who handed him the gavel and stepped from the platform, amidst applause for the newly elected President.

—President Richardson's Inaugural Address.—

President Richardson: Ladies and gentlemen, fellow-members of the National Brick Manufacturers' Association, the highest honor which you can confer upon a member of this Association is to elect him to the office of President. That you have thus selected me for this position, that you have shown me this proof of your confidence and esteem, so fills my heart that I cannot adequately express my appreciation, not only to you as a body, but for the kind and generous words of the gentleman who nominated me for this position. I have been selected not because of any marked success I have achieved in the manufacture of brick, not because I have become a wealthy proprietor of a brickyard, not because I am prominent socially or politically, but because for so many years I have manifested an active interest in this organization (applause), and have attended its meetings regularly, and faithfully performed all duties imposed upon me. I think, gentlemen, that this motive is worthy of all approval, and should govern you in the selection of your officers. I have attended every Convention of this Association except two.

When the first Convention was held in Cincinnati I had only just become a subscriber to the Clay-Worker, and the report of that Convention I read with much interest, and it influenced me considerably in determining to persevere in the line I had marked out and to devote my best energies for the remaining years of my life to the ancient and honorable craft of brickmaking. So, at the second Convention, held at Chicago, I went down from Minneapolis, prompted by a desire to learn more of brick and brickmaking and brickmakers. I had been appointed to read a paper before that Convention by your Secretary, and I was desirous of making a favorable impression on the brickmakers of the country, and that I might convince any one who might be searching for a competent man to take charge of his works that I was qualified for such a position. I was very careful not to say anything about my very limited practical experience at that time, but at the close of the discussion upon this paper the President of the Association, Mr. D. V. Purington, asked me how long I had been engaged in the manufacture of brick. (Laughter.) I had never met the gentleman previously, but I have since come to know and respect him very much, and he has asked me many impertinent questions since then (laughter), but never one that caused me so much embarrassment as that. However, time has cured me of that, and now I am rather embarrassed to have to state how many years I have been making brick rather than how few, and I would sometimes attribute my mistakes to inexperience.

The third Convention, at Memphis, I missed, but I have attended every Convention since, and hope to attend many more. I have come to look upon these annual Conventions as the most pleasurable and most profitable week of the whole year. The hearty greetings of friends, the pleasant interchange of experiences of the past year, the discussions of problems, the enlargement of our circle of acquaintances, and often the reception of new ideas from new members make the attendance at these Conventions something that no progressive brickmaker can afford to miss.

W. D. RICHARDSON, President, Shawnee, Ohio.

I am glad, gentlemen, to see so large an attendance at this, the first, session of our Thirteenth Annual Convention. I am pleased to look into the faces of so many of whom I have met here year after year, as also to see some faces that are new to me, and, alas! I miss some faces here that I have seen year after year, to whom I have become attached, and one, at least, I grieve to say, will never be with us again. Gentlemen, I welcome you all, and I hope to have you present here in the Convention Hall at every session.

There is one matter, before I take up the regular programme, that I feel I must speak about, as it may cause you some embarrassment, as well as myself, and it is a matter that, up to the last moment, has caused me to refuse to allow my name to be presented for this position. I cannot conceal the fact that my hearing is defective, in fact, so much so that I fear it may unfit me to act as your presiding officer, but my good friends here, who have pushed me forward to this place, are aware of that, and in so much should be held responsible. At any rate, I shall rely upon their assistance, as well as upon the assistance and consideration of all of you, and I shall have to ask that those who address the chair do so in a little louder tone than usual, and that those who take part in the discussions come forward to the platform. That has been our custom, and has been a good practice. It is said that two-thirds of all adults are defective in eyesight or hearing; the eyesight can be corrected by the optician, but no device has been perfected of much help to one whose hearing has been impaired. Yet I was thinking, as I stood talking by telephone to the foreman of our works, that the science that made it possible for me to hear him distinctly, though many miles distant—more distinctly than if he were in this room twenty feet away—might some day come to our aid and relieve those of us who have to come up in front in order to get the full benefit of these proceedings. (Applause.)

FRANK B. McAVOY, First Vice-President, Philadelphia.

—The President Decorated with a Gold Badge.—

Prof. Edward Orton, Jr., Columbus, O.: There is one little matter which I wish to bring before you at this time. The local committee has so much reverence and regard for the character of our new President, they esteem him so highly, that they wish to make a little testimonial of their affection and regard for him at this time. His character is of pure gold, and we are going to put on him a badge of that color. (Applause.)

Professor Orton proceeded to pin a medal on the President's lapel. It was the same as those worn by the delegates except that it was gold-plated.

President Richardson: Next in order is the nomination of the Vice Presidents. We have three, and nominations of First Vice President are in order.

Mr. D. V. Purington: I desire to place in nomination for the office of First Vice President one of the members of this Association who began attending the conventions when a boy, and he has kept it up until now his hair is getting gray and his head is getting bald. All this time he has been gaining in experience and wisdom and in the knowledge of the technical features of our business. He is the manager of a large concern making brick in the State of Pennsylvania, and I think most of you will know who I mean when I nominate Mr. Frank B. McAvoy, of Philadelphia. (Applause.)

F. H. Eggers, Cleveland: I second the nomination, and move that the Secretary be instructed to cast the unanimous ballot of this Association for Mr. Frank B. McAvoy for First Vice President.

This motion was seconded and carried.

President Richardson: The Secretary has cast the ballot, and I declare Mr. McAvoy First Vice President. Nominations are now in order for Second Vice President.

Mr. W. A. Eudaly, Cincinnati: I arise to nominate Mr. W. H. Hoagland, of Cayuga, Ind., for Second Vice President, and move that the Secretary be instructed to cast the unanimous ballot of this Convention for Mr. Hoagland.

This motion was seconded by Mr. Adams and carried.

Secretary Randall: The ballot has been cast.

President Richardson: Mr. Hoagland is duly elected, and nominations for Third Vice President are now in order.

Elliott S. Morse, New Britain, Conn.: I arise to nominate a man for Third Vice President, who, while he comes from commercial business, has made a success of the brick business. I nominate Mr. W. G. Titcomb, of Providence, R. I.

Mr. Frank Stiles, North Haven, Conn.: It gives me pleasure to second this nomination, and I move that the Secretary cast the unanimous ballot of this Convention for Mr. Titcomb.

This motion was seconded by several and carried.

President Richardson: Mr. Titcomb is duly elected, and the next officer to be elected is Secretary.

Mr. E. M. Pike, Chenoa, Ill.: I nominate the present incumbent, because we couldn't get along without him.

Mr. D. V. Purington: I second the nomination, but not for the reason that Mr. Pike has stated, and I move that the Treasurer cast the unanimous ballot of the Association for Mr. Theo. A. Randall as Secretary.

Motion seconded by Mr. Eggers and carried.

President Richardson: The Treasurer has cast the ballot, and Mr. Randall is your Secretary for the coming year. Next nomination is for Treasurer.

Mr. Raymond Penfield, New York City: I nominate Mr. Sibley, our present incumbent.

Mr. Adams: It gives me much pleasure to second this nomination, for any one who can turn a deficit into a surplus is my man, and I want him for life. (Laughter.) And I move that the Secretary cast the unanimous ballot of the Convention for Mr. Sibley.

Motion seconded by Mr. George Berry and carried.

President Richardson: I declare Mr. Sibley duly elected, and this ends the election of officers.

Professor Orton, Jr.: There is one officer to be elected to fill a vacancy on the Committee on Technical Investigation. That body is composed of five members—the Secretary, ex officio, and four others—one man to be elected each year. Mr. Ittner retires this year.

Mr. Eggers: I move we re-elect Mr. Ittmer to serve a term of four years.

Professor Orton, Jr.: I wish to second the nomination of Mr. Ittner.

Mr. Adams: I move the Secretary cast the unanimous ballot of the Association for Mr. Ittner.

Seconded by Mr. Morse and carried.

President Richardson: The Secretary has cast the ballot, and Mr. Ittner will serve on the Committee on Technical Investigation for four years. This brings us to the installation of officers, and I will ask Mr. Adams and Mr. Ittner to escort the newly-elected officers to the platform.

Mr. Eudaly: I object. If the Chairman is not worthy of a Committee of Escort, I hardly think that the Vice Presidents or other officers are, and I suggest that these gentlemen come forward, like any other ordinary men, and take their places. (Laughter.)

President Richardson: It gives me pleasure, ladies and gentlemen, to introduce Mr. Frank B. McAvoy, our First Vice President.

—Installation of Officers.—

Mr. McAvoy: Ladies and Gentlemen and Brother Brickmakers—I feel that this is rather unexpected, but that is the way most good things come to us. I feel a good deal as I did at the foot of the Rockies, a few months ago, after I had turned over twice in a railroad wreck. The train stood on a slant, and I wondered if I was going to go at it again, and do it all over. Now, I hardly feel as though I had got settled yet. D. V. was a little bit rough. I am not altogether gray and bald. I want to back up the assertion of our President as to the knowledge and good things that result from these Conventions. There was a time, when I was growing up a young brickmaker, we thought we knew all there was about making nice, clean, red brick in the East, but, after making a few trips over the West, I concluded that the more Conventions I attended, the more trips I took West, the better it would be for me, and I assure you that the benefit that I have derived from attending the Conventions and making trips and meeting with different brickmakers, and the facilities placed at my disposal to witness the different improvements in brick manufacture, by reason of my acquaintance with the members of this Association, has many, many times repaid me. You who have noticed the improvements we have made in one particular kind of brick will back me up and say we are doing fairly well in that line, and we did not find out how to do this in the East. We had to come West to find out how to do it. (Applause.)

President Richardson: I have the pleasure of introducing Mr. Hoagland, of Indiana.

Mr. Hoagland: Mr. President, Brother Brickmakers and Ladies—Of all surprises that I have ever had in my life, there is nothing that ever took my breath away quite so completely as this. I haven't recovered sufficiently to get up here and make a talk, but if I was ever to hold any position in this organization I would rather have been elected in my home State, Ohio, than any other State. I am now in the brick business in Indiana, but I was born and raised in Ohio, and I feel proud that I should be elected to any office in this State. My first Convention was at Atlanta. I have attended every Convention since, and I expect to attend every Convention so long as I have got money to pay my railroad fare one way. I expect to borrow enough money to get back. Gentlemen, I thank yon. (Applause.)

A Member: You can borrow the money all right.

President Richardson: If Mr. Titcomb is in the room, will he kindly step forward?

Secretary Randall: I think Mr. Titcomb has gone out on the street on business. We will have to hear from him during the next session.

President Richardson: It was said very aptly last evening, during the organization of the new Association of Ceramics, that it did not matter very much who the President of these different organizations was, as he only held the position for a year, and the next year some one else came in and he was forgotten, but that the success of the Association depended upon the Secretary, and, if he was a good man, they kept him there as long as he would stay, until they wore him out. It is certainly true of this Association that our success is due to our Secretary, Mr. Theodore A. Randall, and I am pleased to present him as the Secretary for the coming year. (Applause.)

Secretary Randall: Mr. President, Ladies and Gentlemen—These are days of expansion, and if I do not have to get a new hat before I go home it will be very strange, and it won't be due to late hours, or other incidents due to late hours, either. I am very glad indeed to thank you again for this honor, and will promise to serve you as efficiently as my friend Richardson tries to make you believe I do. I do not know that I can say more. Evidently we are in a season of prosperity. There are many new members present with us, and I believe this Convention, held in the capital of the Buckeye State, which I, too, claim as my birthplace (laughter), will be the most successful we have yet held. If it is not, it will not be for want of effort on the part of your officers. (Applause.)

President Richardson: I feel that, as has been expressed here, we would all regret very much to miss the annual report of our Treasurer. They are always so witty and satisfactory. I am pleased to know we will continue to have them. I have the pleasure of presenting Mr. Sibley, our Treasurer.

Mr. J. W. Sibley: Mr. President, Ladies and Gentlemen—It is needless for me to say how much I thank you for conferring this honor and re-electing me to this office. I appreciate this very much. Our Association should justly be proud of the fact that, despite the many vicissitudes through which all business concerns have passed since the date of our organization, we have never been in debt, but have always had the famous surplus in our treasury, and, though I hail from the State that gave to the Union that gallant hero, Joe Wheeler, who stormed the hills of San Juan (applause), and that hero who sank the Merrimac and bottled up the business affairs of Cervera, I trust I may always be able to prevent the sinking of our treasury ship, although I must confess that the temptation to be Hobsonized by our fair sisters is almost irresistible. (Laughter and applause.)

W. H. Hoagland, Second Vice-President, Cayuga, Ind.

Mr. Pike: I want to know if our Treasurer was born in Ohio? (Laughter.)

Mr. Sibley: No, sir; not guilty. I am proud to claim Alabama as my birthplace.

President Richardson: I want you to understand that this office to which you have elected Mr. Ittner is an important one, and I think he ought to be called upon to come forward. (Applause.)

Anthony Ittner: Mr. President, Ladies and Gentlemen—I desire to thank you for the honor conferred upon me, in common with the other officers of this Association who have been honored by you this afternoon. I desire to say that I was absent from only one of the Conventions of this Association, and that was at Buffalo, year before last, and I was only prevented from attending that Convention by sickness. I had a proud ambition to be able to say, when I might reach an age when I could no more attend, that I had attended every Convention of this Association during my active business career. I desire in this connection to say that it would take very old age or sickness to keep me away, because there is nothing I appreciate or enjoy so much as the annual meetings of this Association. It is one of the proudest and sweetest memories that I have to treasure. It has been stated by our Second Vice President that he was born and raised in Ohio, and our Secretary says he was also born in Ohio. I was born in Ohio, but I left the State with my parents when I was seven years old and located in St. Louis, where I have lived ever since—a period of fifty-five years. Now, if you are good at figures, you can tell how old I am. And I can say, furthermore, that I have pride for this State, as much so as if I had lived here all my life, and I desire further to refer to the fact that during the Forty-fifth Congess, of which I had the honor to be an humble member, I was so attached to this State that I got right in among your Ohio delegation, and I had the honor to sit within a seat or two of two of our future Presidents. Within one seat to the left and in the rear of me sat James A. Garfield, and within three seats to the right sat William McKinley. (Applause.) I presume whatever of character I possess I may justly attribute to the fact of my birth and seven years' residence in this State in my boyhood, and the society of such good men as I have named. And now, in reference to the work in which we are engaged and which we come here to do, not wishing to detain you any longer with speeches, I wish to say that, so far as I am able to remember, this is the most largely attended first session we have ever had, and I am not disposed to stop with the first session, but I think this meeting, now, at this moment, is the largest session we have ever had at any Convention of the National Brick Manufacturers' Association in any place we have ever met. I will call on Mr. Randall to say whether he agrees with me.

W. G. TITCOMB, Third Vice-President, Providence, R. I.

Secretary Randall: I think Mr. Ittner is right.

Mr. Ittner: Gentlemen, I thank you again for the honor conferred and for your kind attention. (Applause.)

President Richardson: The next in order is the appointment of committees. I will attend to that later.

Secretary Randall: The next thing is a paper or address on "The Trade Situation." The gentleman who partly promised to be with us and talk on the subject is not here, neither is the gentleman whom he delegated as a substitute. However, there is a gentleman here who has a paper on "Manual Training Schools." It is a brief paper, and he would like to present it if you are agreeable. I refer to Mr. D. V. Purington, of Chicago. (Applause.)

Mr. Purington: Mr. Chairman, the Secretary said the gentleman would present the paper if agreeable. After coaxing me all forenoon to prepare this paper, he finally prevailed on me, and now he says, "If you are agreeable." It is very short, and will not detain you very long.

—Professor Orton Surprised—A Beautiful Gift from the Members of the Association.—

Mr. President and Gentlemen of the Convention:

It is always embarrassing to be sandwiched into a programme unexpectedly, and Mr. Randall has taken an undue advantage of his knowledge that I had a carefully-prepared paper on "Manual Training Schools" written for an entirely different audience. Statesmen, politicians and others who indulge in public speaking are prone to boast of the numerical strength of those whom they represent. I claim to have behind me a constituency of more than 43,000 clayworkers in the United States, who desire, through me, to express their wishes to the members of this Convention. They have given me no definite instructions, but my intimate knowledge of their wishes and desires makes me feel certain that I will be sustained in any position I may take here this afternoon, and that the love and good wishes of my 43,000 constituents will go with me in all that I may say or do.

Every citizen of the United States has reason to be proud of his birthright. In no country in the world are there greater incentives to laudable ambition or surer rewards for honest endeavor than in our own free America. In many respects we are lacking in the culture and refinement which seems to belong to and be a part of the civilization our elder neighbors are blessed with, and it seems sometimes that we suffer by comparison with them, but with another century added to our history this difference will be less marked. In the race of nations for superiority nothing assists them more than the education of the youth, and in no individual nation is this more marked than in our own country. From the little red school house our boys and girls advance step by step through the intermediate, grammar and high schools, academies, seminaries, colleges and universities. It is no longer necessary for an American boy to graduate at a foreign university to have completed a classical or scientific course. The diplomas of our higher institutions of learning have an equal value with those of any other country. Until within a very short time the graduate of any of our American colleges had acquired simply the rudiments of an education, fitting them for practical service as clayworkers. Their knowledge of mechanics and chemistry was simply a foundation upon which to build. The complete mastery of the science (if it may be so-called) of bookkeeping is simply a preparation for the practical experience necessary to make a successful merchant. The student of anatomy and physiology, without the opportunity to practically demonstrate his themes, will never become a successful surgeon. The graduate from West Point or any other military school needs actual war to prove his claim to soldiery attributes. Our manual training schools, perhaps, come the nearest to a combination of the theoretical with the practical, and their establishment has in a sense been forced upon us. "Necessity is the mother of invention" was never more aptly illustrated than in the establishment during the past twenty years of this class of schools, and of manual training departments in many of our higher institutions of learning. To no avocation has this been a greater boom than that of the clayworker. For the advancement and progress that has been made by our craft we are largely indebted to one man. This man, in addition to a thorough technical training, in addition to his natural habits of study and research, had the advantage of years of practical application of theory to practice. I feel safe in making the statement that no man in the United States was better adapted by taste, inclination, education and experience to cut a pathway through the tangled wilderness of ignorance and superstition which surrounded the clayworkers of ten years ago than Edward Orton, Jr. To him the 43,000 clayworkers of this country will always owe a debt they can never discharge. As a slight testimonial of the value they place upon his efforts to elevate the standard of progress in connection with their industry, and with a partial but ever increasing realization of the benefits to be derived from his connection with the Department of Ceramics in the Ohio State University, they have requested me to present to him this little testimonial as a memento of their affection and esteem.

(Calling Professor Orton to the platform, Mr. Purington presented him with a handsome gold watch, chain and charm, and continued:) Now, Professor, the contributors to this little article of ornament and use require no assurance from you that your efforts to assist in the improvement and development of the clay industries will be continued. They know that your heart is in the work, and that your zeal will be measured only by your strength, but they feel that they have the right to ask and to almost insist that a portion of your time shall be devoted to yourself, your family and your friends. They ask you to remember the old adage, "That all work and no play makes Jack a dull boy." That you may be enabled to properly divide the twenty-four hours into seasons of work, rest and play, they request through me the acceptance of this little mechanical device which will materially assist you in making this division. (Loud applause.)

Professor Orton: I assure you I was never more surprised in my life, and I feel I have done little to deserve such recognition at your hands, but, if my efforts for the advancement of the interests of this Association have sometimes in the past been less vigorous than they should have been, you need have no fear of any future dereliction, with this beautiful tribute of your friendship and good will always at hand. There is a wonderful future ahead for this Association. Its pathway grows brighter and better year by year. It has been said on the floor here that the influence of technical education among the brickmakers and in all other branches of ceramic art is yearly becoming more manifest. But it has not been said often enough or strongly enough that the National Brick Manufacturers' Association was really the first ceramic school in this country. On its floors began the first public dissemination of accurate knowledge of the clay industries, and to its benign influence the friendly interchange of knowledge and experience in this line have all been due. It deserves the honor and credit of being the pioneer in the economic progress of the American clay industries. We have in this country every natural facility for taking a foremost rank among the nations of the earth. Nowhere is so rich and so varied an endowment of the natural materials; nowhere can a populace so energetic, so ingenious and so intelligent be found. But last, and most necessary of all, is co-operation and good will. Without these we shall never attain the position which by our natural endowments we have a right to expect. And it is this co-operation and good will among clayworkers that this Association has been able to contribute to and bring about, and it is this gathering power, resulting from the work of the Association, that has made the recent advancements in ceramics possible to its present extent. I can find no words to adequately express the mixture of feelings which animate me on this occasion. The commendation of a concourse cannot fail to stir the pride and raise the courage of any man, no matter how cold or unresponsive his nature may be. But when in such a concourse one sees the faces of friends alone, and from every eye receives the kindly greeting of those whom he loves, pride and courage give way to a feeling of solemn responsibility lest he may fail to deserve what has been vouchsafed him. Gentlemen, for this most beautiful gift, and for the still more precious good will which prompts it, I can only say I thank you from the bottom of my heart. (Applause.)

—Mr. Gates Presents the Association with a Terra Cotta Gavel and Gong.—

Mr. Gates: Mr. President, may I make a little personal explanation? You all know that we Chicago men are modest. If you have not learned it you may learn it, because we remind you of it, particularly those of us who originally came from the State of Ohio. There are others, you see. They sent me out from the State of Ohio at a very early age, and they never sent for me to come back. (Laughter.) I looked for the "letter that never came." Of course, the joke was on the State of Ohio. We Chicago men are persistent—that we need not tell you. (Mr. Purington: "Speak for yourself.") I will speak for you, too. When I realized that I would probably get the railroad fare one way to get here, I knew from past experience that Purington would come well to the front, would nominate nearly all the officers, and make the first speech, and he has done all that. I knew that I would be cut out. There is a peculiar thing about Purington. I presume you noticed the way he shuffled those papers. Now, you did not know it, but there wasn't anything on that paper at all. He has been in training under Mrs. Purington for sometime, and she insists that he write down what he has to say, and he and I have talked the matter over, and he has been practicing lately, and he has concluded that he would just hold some papers in his hand and shuffle them, and get the effect, but really there was nothing at all on them. I knew Purington would have the floor all the time, and, in view of that fact, and not wanting to retire absolutely, I concocted the scheme of making this bell and gavel and presenting it to the Association. This bell is simply to ring at the Chairman's will, and is not in any sense a chestnut bell, for we never have any need of a chestnut bell In this Association. (Applause.)

Secretary Randall: I want to move a vote of sincere thanks to Mr. Gates for the beautiful and appropriate present he has made to this Association of the terra cotta gavel and bell. It is unique, but, like his words, it has a clear ring.

Mr. Adams seconded the motion, which was carried unanimously.

Secretary Randall: This brings us to the regular order, "The Trade Situation." Mr. Barkwill, who was to address us on this subject, has been detained at home. He is a very bright gentleman, and, I know, would have given us something good. He tried to procure a substitute, but that gentleman, too, is unable to be here, but we have a citizen of Cleveland with us, and I suggest that Mr. Eggers be requested to fill Mr. Barkwill's place.

—The Trade Situation, General Discussion.—

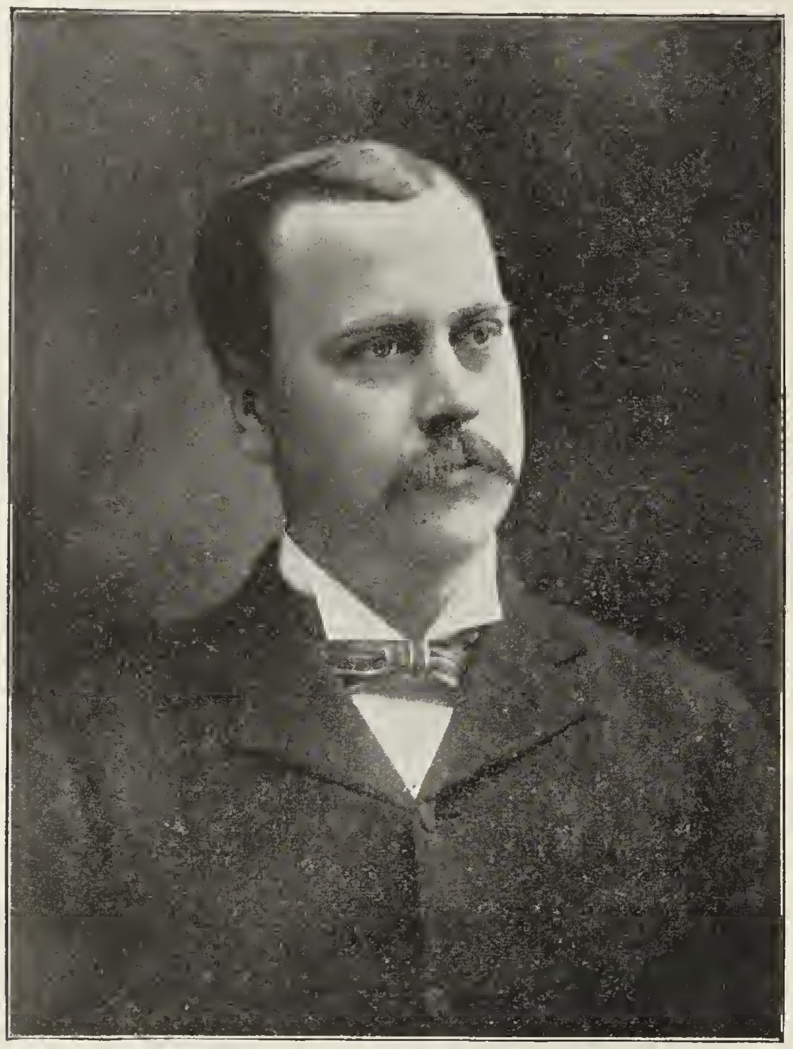
Mr. F. H. Eggers, Cleveland: Mr. President, ladies and gentlemen, I did not expect to have anything to say on this subject, but when I got in here at noon my friend Randall said he desired that I say something on the situation of the trade. It was rather a short notice, and I told him I did not think it fair in him to bring me up here after coming from my place of business and ask me to make an address. However, I will do the best I can. The indications are that everybody is satisfied here to-day, and we see the gold badge on our worthy President and the gold watch and chain given to our Professor Orton, and it seems as though business must have been pretty good all over the United States. (Applause.) I want to say that, so far as the trade in Cleveland is concerned, we are all as busy as we can be. Prosperity is with us so much that the paving brick manufacturers in Cleveland and its suburbs have been unable to supply the market. The paving of many streets that have been contracted for to be paved with brick has been postponed because we have not been able to secure the material, and this has also been the case with building brick. In a measure our National Association had something to do with it, because it got the brickmakers in that portion of the State to come closer together, and I think, while they talk a great deal about combinations and trusts, there are times when business men should, in a measure, get together and see if they cannot better and stiffen prices. This was done lately in Cleveland, not alone among the common brick makers, but also among the paving brick manufacturers. They got together to such an extent that some of the city papers charged that the paving brick fellows had a combine. There was no combination; it was only an understanding that they were to have a fair price for their goods. (Laughter and applause.) It was not a combination at all. You hear to a great extent that these trusts and combines are dangerous, and it is perhaps sometimes wise, when some such arrangement is made like that in Cleveland, not to call it a combine, and it is so at the present time. I want to say right here that there are more contracts let for street paving in Cleveland and within a radius of one hundred miles than all the brickyards can supply, and they are all getting good prices, just because they have a little understanding.

THEO. A. RANDALL, Secretary, Indianapolis.

When I was first called upon I did not think I could say anything. It seems it is coming a little bit to me. Some one suggested that I should make a political speech, because we brickmakers are all politicians, particularly those born in Ohio. I was not born in Ohio, but am quite an Ohio man. From appearances, I think if some of these brickmakers were down in the United States Senate they would have ratified that treaty long before the Senate did. I think we have as level-headed men in this Association as they have in the United States Senate, and I am sorry that some of our Senators are slow in demanding that the treaty be approved, and it should have been ratified long ago. This is not a political association, but we are all business men, and I think it is time our Congress in Washington behaved themselves and did business, so we can go ahead and make a little money. (Applause.)

President Richardson: It has been customary at this session of every Convention to have some such topic brought up, and we always expect to hear from members from various sections of the country. I might say here for the benefit of the new members that it is a rule of this Association that remarks be limited to five minutes, and that no speaker be allowed to talk twice on one subject until all who desire to speak have been heard. I have been requested to call upon Mr. Plumridge, of St. Louis.

Mr. T. P. Plumridge: I am from Ohio. (Laughter.) I am in Ohio. On the other side of the Mississippi river we have a great deal of clay and we are trying to work it up, but, I am sorry to say, during the past year they have worked up a great deal of it for a very little money. Our prospects at the beginning of the year were good, but owing to a little misunderstanding, as interpreted by the gentleman from Cleveland, we have not been able to pocket as much money as the Cleveland manufacturers. I hope they will see the error of their way and be governed by what they will read (some of them are not here) in the printed proceedings of this Convention. We understand, also, that Chicago has prospered in the brick line. But St. Louis is coming to the front. She has the greatest pressed brick industry in the country, and, I suppose, equals in fire brick any section of equal area. There is no question about her facilities; they are being enlarged all the time, and St. Louis is practically a brick city. They furnish material from the Atlantic to the Pacific and from the lakes to the gulf. The only trouble is, her clayworkers have not been able to see the necessity of getting and keeping together. (Applause.)



JNO. W. SIBLEY, Treasurer, Coaldale, Ala.

J. C. Adams: From the remarks of our friend from Cleveland, I would read between the lines as to why the brickmakers of Cleveland are in a fine condition to-day. It should be an example for the brickmakers of a section to come together with an understanding, one which would not be against public policy, so that they might get a better price for their brick and a better return for their money. A remarkable situation confronts the brick manufacturers of this country in reference to the price of the goods they manufacture. I will venture the assertion that no gentleman here can stand up and say that the brick buyers or brick users of this country assert that brick are sold too high or sold high enough. It is commonly understood by the builders, buyers, architects and users that brick are being sold too low. No one finds fault if you get a fair return for your investment. No one kicks because you add a dollar to the price of your brick, because the brick manufacturers of this country have been giving all their time, capital and labor and energy for the last ten years that the people might reap the benefit of their investment, and the time has come when they are about to ask a fair return for their investment. I believe we are about to enter upon an era of prosperity in our beloved land. When it is known that six hundred million dollars' worth more of our produce, manufactured, raw and stock of every description, goes to people in all parts of the world, how long will it take us to get all the other peoples' money? Six hundred million dollars stands to the credit of this grand country. Now, are not the brick manufacturers to get some part of it? Are we going to say like the Hoosier who moved out to Kansas—he was a ne'er well-to-do sort of chap, who never had prospered? He settled on a small farm out in Kansas, and a man who had known him in Indiana happened to go out West, and he run across this fellow, and he said: "Great heavens, John! are you here?" John said: "Yes, I am here in Kansas; moved out here on a farm." "Well," said the friend, "how are you getting along?" "Pretty well." "Making any money?" "No, I'm not making any money, but I am doing better than ever before." "Why, how do you make that out?" "Well," said John, "I am not losing as much money as I used to." (Laughter.) We must not be like this farmer and say we are satisfied because we are not losing as much money as we have been. We know in some of our States the statutes are very strict, and I would not advise a combine, but if a little understanding could be had we would profit by it. Let us as brickmakers gather a little of the benefits of this prosperity. Let us get together in our different localities, and see if we cannot get some of the benefits we have not been able to get heretofore. (Applause.)

President Richardson: In view of our recent understanding with Great Britain and the relations existing at present, I think it proper, inasmuch as we have a gentleman here who comes from Canada, that we hear from him. Will Mr. J. W. Carson, of La Prairie, Canada, please come forward?

Mr. Carson: Gentlemen, this is the first time I ever tried to make a speech in my life. Speaking of the trade situation makes me think of a little experience we had in our territory. The climate up in our section is very severe. We have very cold winters, and there has been a feeling that paving brick would not stand the weather we have; they might stand natural wear in the street, but they would not stand the combined wear and the action of the weather. We had quite a fight. We made use of our National Association reports, and we asked the engineer to allow us to put down a section of paving brick, and he finally consented, and we put down a section of paving brick on the heaviest traffic street in Montreal, and in about three weeks after that was put down it was condemned. That was quite a knock, but we had a little knowledge where in Chicago the same thing had been done, and we told the City Engineer and the Council not to be too hasty in the matter and let the thing go a little while. Now, that was three years ago, and not long ago that pavement was inspected by the engineers and said to be the best pavement ever put down in the city of Montreal, and the City Engineer has promised that in the future he will specify paving brick for the streets. This is an instance of a little prejudice we had to overcome, and we got the better of it. (Applause.)

President Richardson: Last year, when we were at Pittsburg, we got a pretty good understanding of the conditions there, and we would like to hear how they have fared the past year. I would call on Mr. Evans Jones.

Mr. Evans Jones: I am a new member, and I prefer to hear others.

President Richardson: We would like to hear from D. P. Guise.

Mr. Guise, Williamsport, Pa.: Ladies and gentlemen, I have been manufacturing building and paving brick for the last six years at Williamsport, Pa. There are a great many things that enter into this question that could be obviated, if certain things were not done that are being done right along. There are certain gentlemen traveling around through the country, hunting up clay banks and persuading people to establish a yard and make brick; it matters not whether the material is adapted to the purpose or any sample was ever made. Their product is disposed of and they get their money. This is the greatest evil to-day we have got to confront as brickmakers. I found this out in my travel over the country trying to sell paving brick. By these methods brickyards are established, brick are made that are not fit to be put down in any street, but they are laid down and they prove a failure; that report goes out all over this country. The asphalt people take advantage of it; they publish it from Dan to Bethsheba. What is the result? You cannot get your best brick on the market. I know this, and the thing to do is to establish a standard so high that these inferior brick could not get on the market. Then prosperity will come to the paving-brick makers, and not before. It is a very difficult thing to dispose of a good article when these things are staring us in the face. The arguments are against you, and the asphalt people publish it everywhere. Now, until this Association and the municipalities do something along this line we will have to encounter the evils and suffer the consequences.

Mr. Carson: I think there is a little misunderstanding as to my remarks. It was not because our brick were poor that the street was at first condemned. In fact, the wear of the brick has proven them to be first-class. They put a section of that same street down in asphalt, and, as compared with brick, the asphalt has been repaired three times and the brick not at all. The brick were not poor brick; they were strictly first-class, and the street now, after three years' hard use, proves it. The point I meant to make was that engineers ought not to be too quick to condemn new pavements.

President Richardson: We would now like to hear from New England. I will call upon Mr. Frank Stiles.

Mr. Stiles: I beg to be excused.

Mr. Grant Dibert, Pittsburg: I come from the city of Pittsburg. The past year has been about as good a year as we ever had. Pittsburg, as most people know, is the leading manufacturing city in the Union for nearly everything, particularly in iron and steel, and there is no doubt but that we will have a splendid year for brick. I have been talking with several manufacturers of Pittsburg the past month, and some of them have had to refuse orders. A great many of them will not take any more orders, for they already have more than they can supply. (Applause.)

D. H. Haeger, Dundee, Ill.: I have been expecting for some little time to hear from our Chicago brickmakers. As you will all notice, they are all very modest—very, very modest, just now. (Laughter.) Though I am not here to play the part of a mendicant, there are some things that ought to be mended a little. I am surprised that these modest Chicago men do not say something. Now, I am just about two miles outside the boundary line of the Cook county—I will not say trust, I will not say combination—but friendly understanding. (Laughter.) The consequence is this: they deliver brick in my section for $4.50, where it costs me $6 to make them. Since their understanding they have stopped cutting each other, and are now working on the brickmakers just outside the territory line. I am not suffering for bread and butter, but this is the condition of things in my section of the country. If this is not so, I want to hear from the Chicago men—if they are not too timid to get up and say I am not correct. (Laughter and applause.)

Mr. Purington: I do not know anything about the situation referred to by Mr. Haeger. It is a very rare thing that we sell any brick up in that part of the country, but if the situation is such that Mr. Haeger cannot stand it, if he cannot make brick there and sell them as cheap as the others, then the thing for him to do is to go into some other business. I presume it is possible that some of our Windy City brick manufacturers have made it a little warm for him up there, and if Mr. Haeger feels too badly there is one thing he can do: if he can't compete with these people he will have to quit; or move into Chicago, Friend Haeger, and we will take you in. (Laughter.)

Mr. Haeger: Why is it brick can be shipped out of Chicago and sold for $4.50, when it costs $6 to make them within a stone's throw of Chicago brickyards? (Laughter.)

Mr. Purington: Hold on, don't laugh. I do not know that either of these statements are true. (Laughter.)

Mr. Haeger: I will vouch for the other territory if you will vouch for Chicago. (Laughter.)

Mr. Purington: It is possible that there may have been a little misunderstanding, by which things have got somewhat conflicted and mixed up, and in this way Mr. Haeger has got sort of mixed. (Laughter.)

Mr. Eudaly: This discussion would be all out of order were it not for the fact that Chicago is going to take in all the rest of the country.

President Richardson: I did not mean, by calling upon the gentlemen that I did, that no one else was to speak, but we seemed slow in getting started. We have other good men here, and would like to hear from all of you. I have been requested to call on Mr. Eisenhart, of Horseheads, N. Y.

R. G. Eisenhart: Mr. Chairman, ladies and gentlemen, I have not come up here to make a speech, and I need not proceed very much farther before you will readily discover that for yourselves. So far as the trade situation is concerned, in our part of the country, I do not know that I can express it any better than to refer to Brother Eggers's speech. I do not believe in any combination, but we have made brick long enough to learn that a little bit of an understanding among ourselves as brickmakers does not come amiss, and we have been trying to make each other believe that for a number of years, and it was not until the last year that we fully succeeded. We have only two brickyards, with an output of 12,000,000, and we have learned that $6 for brick delivered at the job is much better than $4.50. We do not believe in combine—we don't want any—but we have a good understanding. (Applause.)

Mr. Eudaly: I want to make a suggestion. I am sorry that this discussion has taken this turn. I think it is all right for gentlemen in certain localities to make whatever arrangement they please or deem proper, but I do not think it wise in this Association to discuss these matters in Convention.

—Letters from Absent Members.—

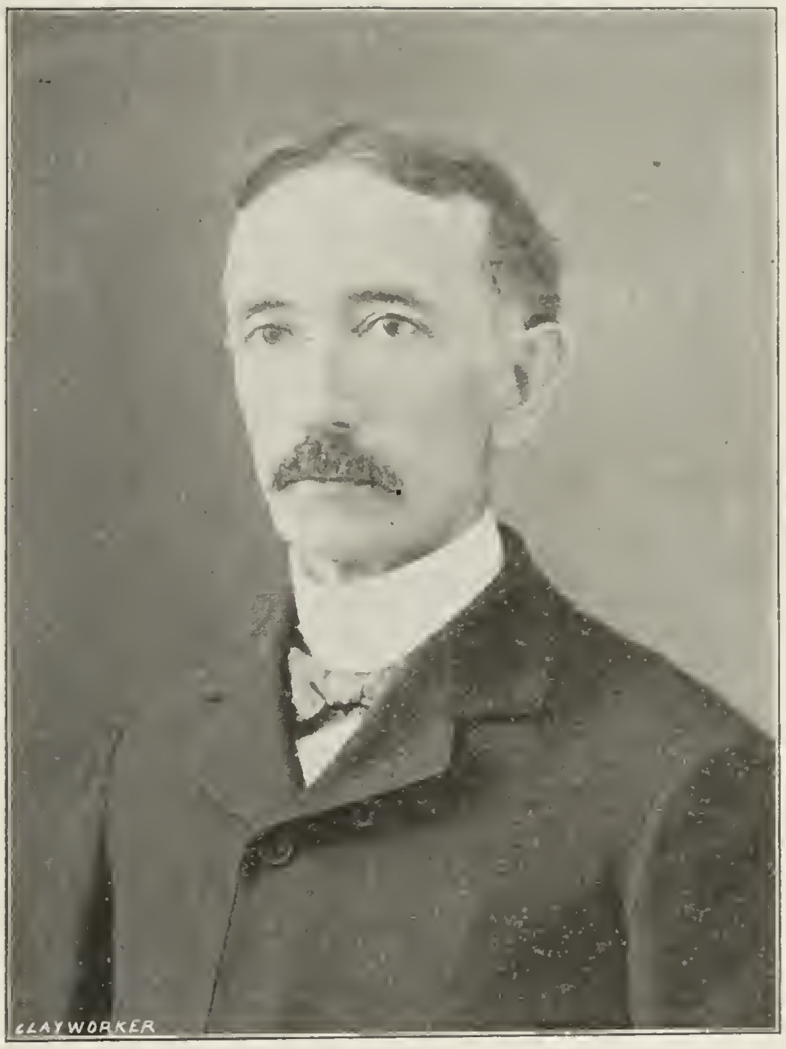
Secretary Randall: This terminates this part of the programme. There is a matter or two we can well consider before leaving. The usual banquet occurs in the dining room of the hotel at 9:30 this evening. Those who have not registered and received their tickets of admission should do so immediately after adjournment. There are quite a number of the faithful who are not with us this afternoon, and will never attend another Convention. A committee will be appointed in due time that will make proper mention of them. I have a letter from an absent member I should like to read.

Mr. T. A. Randall, Secretary N. B. M. A., Columbus, Ohio:

Dear Sir—Up to the very last minute yesterday I had hoped to be able to go to the Convention as usual, but circumstances this time are against me. We have a large amount of work on hand, requiring imperative attention, and a very large contract which I had hoped to consummate last week has been delayed, and will require further attention in a day or two, which makes my appearance at the convention this year entirely out of the question. Of course we are glad to have plenty of work and more coming, but I almost wish it would come a little sooner or a little later. This will be the first Convention I have missed in about ten years, and it seems a little like breaking an old habit. I hope you will have a very pleasant, successful and satisfactory meeting.

Inclosed is $2 to pay dues for next year. Please acknowledge and oblige. Yours respectfully, The Eastern Machinery Co.

New Haven, Conn., Feb. 6, 1899. J. WHEATON STONE.



L. G. KILBOURNE, Columbus, Ohio.

I also have another communication I would like to read.

Mr. T. A. Randall:

Dear Sir—Your very kind and urgent invitation to come to Columbus is hard to decline. I am sure I would rather go to see the clay craft than Clay Clement or any other show on earth. Thanks be to the faithful and congenial Clay-Worker, I feel pretty well acquainted with my fellow-craftsmen, and I would dearly love to meet them face to face. So many of the good brothers have departed this life lately that it seems to me not inappropriate that I send them a simple little reminder in verse that we, too, are passing away. Still, whether the following message is worth reading, or whether you would care to read it to the great Convention or not, is, of course, entirely optional with you. Still I believe in the divinity of impulses, so here she goes, at least, as far as Indianapolis:

Just a word or two of greeting
While Old Time is swiftly fleeting,
And our hearts are surely beating
Toward terrestial adieu.
In the mountain top or hollow
May He, who sees the falling swallow,
Help us lovingly to follow
In the footprints of the true.

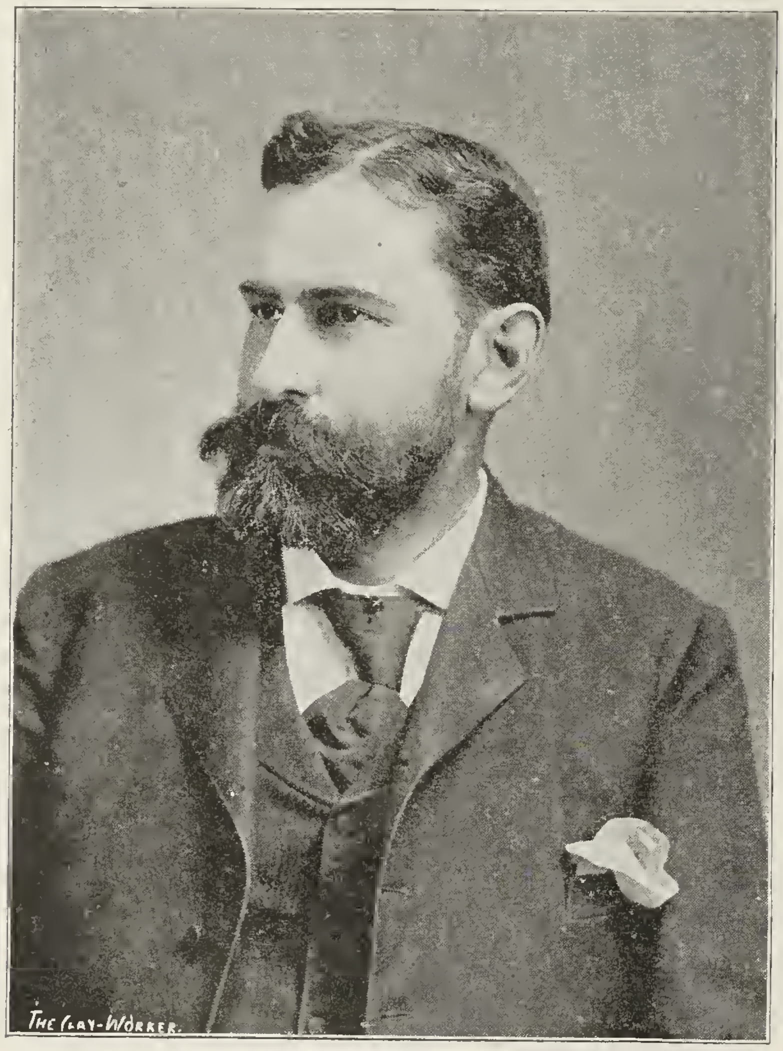
With kindest wishes for all, and hoping to be with you next time, I am, in very great respect, your brother,
MONTGOMERY C. MEIGS.

We have been accustomed to have with us a very earnest, faithful worker, a charter member, whose absence is caused by what is feared will prove a fatal illness. I refer to R. B. Morrison, of Rome, Ga. I know the sympathies of every member will be with Mr. Morrison and his family.

—A Tribute to the Memory of James Taylor.—

Mr. Bloomfield: Mr. President and gentlemen, the tender rhyme of the absent member and the Secretary's reference to the illness of our ever-faithful Brother Morrison brings home to me most forcefully the loss by death of another faithful member of this Association. In my journeyings to these annual Conventions I have in past years been accompanied by my dearest friend and companion, James Taylor. A few weeks ago he was suddenly called to final rest, and to-day there is here a vacant chair that none of us can hope to fill. In his death this Association and the entire clayworking fraternity suffer an irreparable loss, for he was a man of such superior intellect, such generous impulses, so ardent and enthusiastic in all matters pertaining to the clayworker's art and so unceasing in his efforts for the common good of all, that his death is a personal loss to every member of this Association, and, moreover, to every clayworker throughout the land, for by his contributions to the trade press he added generously to the general store of knowledge. Not only was he a man of superior intellect, but he was the embodiment of kindness and gentility. Very few, indeed, among us possess so many virtues and so few faults as did James Taylor. No words that my tongue can utter can adequately express the grief I feel at his untimely death. His record as a clayworker stands unrivaled. He pioneered the way for what is now a great industry. Coming to this country when a young man, he introduced architectural terra cotta, and, with an enthusiasm born of a righteous cause, a brave heart and a strong mind, he labored unceasingly until that material was accepted by the architects of the country at its real worth, and to-day, in all the large cities throughout this broad land, are monuments to his skill that would do honor to the memory of any mortal man. Those of us who knew him personally will ever fondly cherish the memory of his many virtues, chief of which was love and charity for his fellow-man. His motto in life was "Do right by one another," and nobly did he live up to it. As we gather at these yearly meetings we may well say, with Tennyson—

"Oh! for the touch of the vanished hand
And the sound of a voice that is still!"


THE CLAY-WORKER.

CHAS. A. BLOOMFIELD, Brooklyn, N. Y.

Mr. Adams: I have a matter I desire to bring up. Most of you know that the National Association of Builders holds its annual meeting this week in Milwaukee, and, in view of the further fact of the close relations existing between the two Associations, and the intimate business relations between the manufacturers of clay products and the builders of the country, I desire to offer, and move that the Secretary be instructed to send, the following telegram:

W. H. Sayward, Secretary National Association of Builders, Milwaukee, Wis.:

The National Brick Manufacturers' Association, in its thirteenth annual Convention assembled, send greeting and unanimously express the hope that your meeting, like ours, may be the largest and most successful you have yet held, and, as heretofore, be fruitful of good results to our common interests.

This motion was seconded by Mr. Eggers and carried.

Mr. Eudaly: May I have the privilege of bringing something to the attention of the Association? The letters I am about to read, gentlemen and Mr. President, come from the Cincinnati League and the city of Cincinnati.

CINCINNATI'S BID FOR THE NEXT CONVENTION.

To the Officers and Members of the National Brick Manufacturers' Association, in Convention Assembled at Columbus, Ohio:

Gentlemen—The undersigned have pleasure in presenting to your Association, on behalf of the commercial organizations of Cincinnati, a cordial invitation to hold your next meeting in this city.

The central location of this city, its ready accessibility to all the great lines of railway, render it the logical convention city of America.

The hospitality of our citizens, the beauty of our suburbs, and the many points of meritorious interest to visitors in the city proper add emphasis to our invitation, to which, it is earnestly hoped, a favorable response may be secured.

This invitation is presented on behalf of the Cincinnati League, which in such matters represents the Chamber of Commerce, Manufacturers' Club, Cincinnati Board of Trade and Bureau of Transportation, Merchants and Manufacturers' Association and other kindred commercial organizations.

A letter from the Mayor, indorsing this invitation, in also submitted. Yours truly,
WM. B. MELISH, President.
E. P. WILSON, Secretary and Manager.
Cincinnati, Feb. 6, 1899.

To the Officers and Members of the National Brick Manufacturers' Association, in Convention Assembled at Columbus, Ohio:

Gentlemen—Whereas, the Cincinnati League, which represents fully the commercial and social interests of the city, has tendered to your Association an invitation to come to Cincinnati in 1900, I have pleasure, upon the part of the municipal authorities, in confirming the invitation and assuring you that should it be accepted every effort will be put forth to render the sojourn of your membership in the city most agreeable. Very cordially,
GUSTAV TAFEL, Mayor of Cincinnati.
Cincinnati, O., Feb. 6, 1899.

Now, gentlemen, it is true you are meeting this year in Ohio, but you must remember that Ohio is not all in Cincinnati, though all of Cincinnati is in Ohio. Yet all of the business citizens of Cincinnati do not live in Ohio. Several thousand people who do business in Cincinnati live in an adjoining State. We present this invitation to you now because we would like to have you meet in Cincinnati next year. We think we are prepared to entertain you, and do it in a way that you will not regret having met in Cincinnati. As this invitation states, Cincinnati is a large city, centrally located, and we would like very much to have the Association meet with us. We do not claim to do everything in Cincinnati, neither do we pretend to be the biggest people, but we do pretend to have the greatest hearts, and we pretend to be able to entertain you as well as any city in the Union, and you know this Union, since yesterday, wraps the globe. (Applause.) Now, I trust this matter will be considered favorably, and I trust no gentleman will hurt my feelings by saying that the first meeting was in Cincinnati and that this year we are meeting in Ohio. Ohio has nothing to do with it, but, if it did, I am certain you will all bear me out in the statement that the world has never grown tired of getting good things from Ohio, and, I think, never will. Why, we make more good people in Ohio every year than can be used in the entire United States. (Laughter.) I trust you will all just say, we want the Convention to go to Cincinnati.

Mr. Howard: I would move this matter be referred to the Executive Committee.

President Richardson: A motion is not necessary, as it is an understood rule that these things be referred to the Executive Committee.

Mr. Eggers: I move we adjourn until to-morrow morning.

Motion seconded by Mr. Morse and carried.

SECOND SESSION.

Wednesday Morning, Feb. 8.

President Richardson: Gentlemen, we are ready to open our second session. The Secretary will read the first regular number on the programme.

Secretary Randall: The first in order of business is a paper, "The Commercial Side of the Brick Business," by T. P. Plumridge, St. Louis.

COMMERCIAL SIDE OF THE BRICK QUESTION.

Mr. President and Gentlemen of the Convention:

In treating of this subject it is hard to tell just where the manufacturing side ends and the commercial side begins. They are so closely related that in order to treat the commercial side with fairness we must of necessity go back to the condition of the plant and its fitness for producing a maximum amount at a minimum cost.

Boards of Directors may meet and call the officers to task for not making money enough to declare dividends, when the facts are that the same Board of Directors would not allow the manangement to spend a sufficient amount of money to keep the plant in proper repair and up to date. Improved machinery and methods move on us so rapidly in these days of progress that the brickmakers cannot afford to ignore either.

I venture the assertion that it would be a difficult matter for a machine maker to now recognize the handiwork of his shop which he turned out fifteen years ago.

This unquestionably applies to dry press machinery, and it is unreasonable to suppose that our "soft mud" and "stiff mud" friends have not kept abreast of the times.

The improvements may not be an entirely new machine, but the addition of appliances not dreamed of in former days adds tenfold to its value.

I mention this feature only as an illustration which may be applicable to other portions of a plant, and the lack of which may seriously interfere with the output and consequently the profit.

If you cannot get your clay to your machines as cheaply as your neighbor you are at a disadvantage to that extent, and he has just that much advantage over you in the market.

The commercial side of a question, as I understand it, is the trading side. If you start with a handicap the chances are you will either drop out of the race or be overtaken, which practically means the same thing.

The last five years have been trying to all of us. Dark clouds have gathered, and their gathering has been portentous. Some have gone down like sturdy oaks, while others have bowed and bent in the fierce storm, and have come out of it five years older and ten years stronger. With the financial horizon cleared, why not look over your plant and see if you are not ready to make the improvements you contemplated when the "times got better."

With the plant in successful working order we face the subject proper, the foundation of which is in knowing what your product costs, not approximately, but actually. I have talked with brick men who have stated that they knew "about" what their brick cost them, and were able to sell as low as any of their competitors. The same old story, following the market down until ruin stared them in the face. They figured that so many men at the clay bank, so many at the machines, and so on through the list, produced so many brick.

They did not take into consideration their fixed expenses, their taxes, interest, repairs, renewals and items of that class. Had they done so they would have undoubtedly come to the conclusion of a member of the Illinois Clayworkers' Association, as he expressed it at their meeting last month: "It is better to sell an hundred thousand brick at a profit than a million at a loss." It is not only essential to know the actual cost of your product, but to be able to determine the cost in detail.

For this purpose accurate accounts should be kept with each department to enable you to make monthly or quarterly comparisons. This would seem to be necessary in the management of small as well as large plants.

I fancy I hear a voice saying: "Well, what of it? It's not my funeral if my competitor sees fit to ruin himself, and the sooner he does it the better for me."

We will try to see if you are not helping to dig your own grave while attending the funeral of your competitor. Through his stupidity or ignorance he brings the market down to cost or below —you must perforce follow—willing or unwilling. How much money are you making while he is possessed of the suicidal mania? This class die hard; what is the remedy? Organization. I care not whether you get together to maintain living prices or for any other object, so you get together.

The very fact that you have an association and meet occasionally will make you feel better towards each other. If you would then take advantage of your privileges many a dollar might be saved.

Granting that all precautions are taken for keeping accurate accounts, and that the plant is well managed, unless we can dispose of our product cheapness of production will not add to our resources, neither will it make a market where none exists. A few thoughts as to the best way to get the most there is out of the market will not come amiss. The selling department should keep in close touch with the manufacturing. This question may not arise in a small business, but where large interests are handled it must of necessity come up.

The man who has charge of the sales must be intimately connected with what is produced, and the more practical knowledge he possesses the better.

As an instance of this, and however you may deprecate the machine man and his methods, you must admit that he knows his business. He may not know just how many cogs there should be in a pinion driven by a pulley of a given diameter making a given number of revolutions to make the desired number of revolutions of the gear, but, as a rule, he can tell you all about making brick, from getting the clay to the machine, to burning them, and he will figure out your own market if you will let him. If he don't know it all he is impressed with the idea he knows a good deal, and when a man is thoroughly convinced that his side of the subject possesses merit he carries conviction with him.

This earnestness is essential in selling clay products as well as machinery.

Why is it sometimes a customer makes for your inside office and interrupts you just when you don't want to be interrupted? Is it because he thinks the men on the outside don't know enough about the practical part of the business to give him satisfactory information? or perhaps the outside man has a chronic headache or a bad digestion. He has been with you a long time; his duties have become a second nature; he couldn't be pleasant if he wanted to. He may be your partner or an officer in the company, but the effect on your trade is just the same. You have not noticed it, but the trade has, and if they cannot get at the man they want they will go elsewhere, and nothing will stop them.

It behooves you, therefore, when you are looking over your machinery and kilns not to overlook your human machines. They may need a rest or an overhauling as well as the iron, the clay and the steel. The probability is if trouble exists in this line that a rest will prevent an overhauling.

It occurs to me here that you yourself, as owner or manager, might take a glance into this self same mirror and see if you have changed in the last five years. Do your old customers seek you out as they did in earlier days, or do they appear to be looking for something about your place which they never seem to find? A pleasant word or friendly greeting never comes amiss.

The story is told of Mr. L. Z. Leiter, the father of the present Lady Curzon of India, and a former partner of Mashall, Field & Co., of Chicago, meeting a young salesman of the firm one morning, he asked him when he got in. The reply was: "This morning, sir." "Did you have a good trip," asked Mr. Leiter. "Yes, sir, very good, and sent in some good orders." "Well, what are you going to do now?" asked Mr. L. "I don't know, sir; stay around the store for a week or so and then start out again, but in what direction I am not advised." "Well," replied Mr. L., "that being the case, and having stocked up your trade in your territory, just start out again to-morrow morning, go over the same route, and shake hands with the customers."

T. P. Plumridge, St. Louis.

The old gentleman knew the value of making friends as well as making customers, and was willing to spend a few dollars in that direction. Spending money for the benefit of trade is like judicious advertising—it is an art.

Having secured your trade the next important step is to keep it. If you promise certain deliveries see that your customers are not disappointed. If by fate or chance you are not able to keep your promises do not wait until your customer comes to your office with a complaint, but advise him at once, and forestall him, thereby preventing the vigorous expletives, which, in the nature of men, and especially contractors, are sure to follow. Under no circumstances allow your shipping department to mislead the trade by informing them that the goods, whatever they may be, "are on the road," when in fact they have not left your yard or factory. Sooner or later this sin will find you out, and the "last half of that man will be worse than the first."

—Collections.—

This is an important department. Your sales' department may be of the best; it may be organized with competent, active and efficient men, but many a good customer has been driven away by a bungling, surly, irritable, fossillated specimen of humanity who is placed in charge of the books on account of his peculiar adaptability for that work, and the collections naturally fall to his lot, His constant association with figures make of him a monumental fact. Unyielding and methodical in his own existence, he expects all men to be like him and his straight column of figures. A collector of this class will drive more trade away in a day than you can regain in a year. Men must be taken as you find them, and not as you would have them.

To avoid as much unpleasantness as possible in this direction a contract is at all times preferable to a verbal understanding. It need not necessarily be filled with "whereases," "aforesaids," "parties" of all kinds of parts, but a simple memorandum, if you please, showing price, date of sale, time of delivery and terms of payment. When the bill becomes due you will not be under the necessity of apologizing for your money. You have simply to call attention to this memorandum contract, of which he has a copy, and the most sensitive of men cannot object or become offended.

To increase the demand for clay products and enlarge our business is the next consideration. I would suggest that closer relations be established with the architectural profession. To do this there must first be merit in the goods you make and which you want to introduce. It matters not whether it be a good hard brick for a foundation or a glazed tile for the roof.

An occasional call by the General Manager or owner on an architect at his office will be appreciated and make subsequent receptions of your representatives more cordial. I am aware that local conditions make local customs; what could be done in Columbus among the profession might not work in New York, but the fact remains that if the clayworkers as a body could impress the architects as a class with the superior merits of our goods there would be fewer buildings with wooden and galvanized iron cornices; more buildings with terra cotta sills and sill courses, and clay products would enter where now wood, stone and metal is used.

How are we to do this? If done at all it must emanate from a body such as this. This Convention can take steps which will insure a favorable reception of representatives of the clay industry by their local architects. The question was discussed at the last Convention, and it was resolved to appoint a committee to collect facts and arguments, have them printed and distributed to members. The plan as outlined was too comprehensive. Architects have not the time to read reports of any length. What will do for the Supervising Architect at Washington will not answer the purpose in Cincinnati, Louisville or Peoria. Here is where a local organization of clayworkers can perform important work for the craft. Excellent reading can be given to the public through the daily papers by selecting subjects discussed at these Conventions from Convention reports. Our legislators can be interested, and, if necessary, let each State have a school of ceramics to elevate the ideas of people as to the importance of our work.

FRANK MANSON, Boston.

The object of this paper being merely to call attention to possibilities of the commercial side of the brick or clay business, its purpose is at an end. (Applause.)

—The Commercial Side—General Discussion.—

President Richardson: Gentlemen, this paper on the commercial side of the business is now open for discussion. We will be glad to hear from those men most interested in this part of the business. There are several men in this Convention who are concerned wholly with the commercial side of the business. Some of those who attend our Conventions regularly are not brick manufacturers, but are middle men and handle the brick between the manufacturer and user, and I would like to hear from some of these gentlemen upon this question.

Mr. Frank Manson, Boston: There was one point taken by Mr. Plumridge which I think was well taken. I am not a manufacturer, nor a middle man, but this thing of going before the architects with papers and circulars, which Mr. Plumridge referred to. I sincerely believe with Mr. Plumridge that circulars and reading cards, such as he referred to, sent through the mails, are not effective, and I hope there will be some attempt made at this session or at this meeting to get what is taken up here before them in a journalistic way. Mr. Plumridge's remarks about doing it through the papers in the different localities is, I think, a very good one, and I think the suggestion should be considered seriously. Now, architects, as a rule, are busy men. We know that, and their professional capacity brings to them a great deal of circular matter, some of which is simply looked at and thrown in the waste-basket, and some is never looked at at all, and some of them have their draftsmen open their mail, and where a circular does not seem to be of particular interest it does not reach the architect at all. I think the idea of getting this matter into the local journals is a very good one. I do not know what further action has been taken on the matter brought before the Convention last year. At our office we received one or two letters asking for our co-operation in a journalistic way, which we were very glad to give, but further than that we have not heard from the committee at all. That is all I have in mind to say, but I hope this thing will be pushed through.

Mr. Gates: I want to say here that you have just been addressed by a man who is so modest and retiring that you very seldom see anything of him. Being a Chicago man, and so modest myself, I have a kindred feeling for him. In the years that I have been in the business this particular field that you have just been discussing has been pushed more by the quiet, unassuming man who has just addressed you than by any other man in this country. I have looked into this matter considerably. I find in the architect's office, wherever I speak of the Brickbuilder, the young draftsmen know all about it, know everything there is in it, and the man who has just addressed you is pushing your business in a way you hardly realize. The trade side of our business, the commercial side, depends largely upon the architect. Do you know that ninety-nine men out of one hundred, when they employ an architect, are guided by him in almost every detail of construction of the building? If he says brick, it is brick, and the man you have to reach to a very large extent is the architect, and the man you have to reach almost to a larger extent is the man back in the architect's private office, the man who is drawing the plan in the architect's office, and the method of getting before that man quickly and effectively is done more by the man who has just addressed you than by any other man in this country, and I just want to emphasize that one point.

President Richardson: We would like to hear from F. W. Meeker, New York city.

—Standard Size of Brick—General Discussion.—

Mr. Meeker: As a gentleman said last night, I'm a yearling. I am comparatively young in this Association, and I would like to have grown a year before I said anything, but, as you have brought up the commercial side of the brick business, I will say that interests me more than anything else. We are mostly dealers, and we have had a great deal of trouble in New York city by not having a uniform brick. We find of all the brick we get there are not two factories making exactly the same kind of brick. If we could have adopted a uniform size of brick it would be a great help, because often times we expect to get a certain quantity of brick, and the factory is not ready to fill our order, and we try to get it from another factory, but the size is not the same, and we are in that way often embarrassed. We recently had a large fire in New York city that has made all the architects think of brick for the outside of buildings, and I think it is going to operate there largely to the advantage of brick and against stone. I do not think that you will find stone used more than five or six stories high. But brick will be used, ornamental brick and terra cotta. Of the great buildings designed in New York the top part will be brick.

Mr. Ittner: I want to say a word on this line. The gentleman brought out a sugestion on the uniform size of brick. Of course I was rather surprised to learn what we have just heard from the last speaker. I hear a great many discussions in the Convention and in the lobbies as to what the Association ought to do. One person has this idea. and the other an opposite idea, but every gentleman seemed to be of one idea on the subject of the uniform size of brick, and, what is more astonishing, there was no difference on this question in the minds of the National Association of Builders, nor in the minds of the National Chapter of Architects. What more could be done on this subject by the national bodies in their unanimous and emphatic declaration upon this point I can't imagine. It has been six or seven, or perhaps eight, years ago —yes, ten years ago—that this Association at one of its Conventions established a uniform size of brick, and they communicated with the National Association of Builders on the subject, and the National Association of Builders, by unanimous vote, established the size or indorsed the size we established, and it was also laid before the architects of the country, and they indorsed our action. I cannot exactly say what the size was, but I know the thickness was 2¼ inches for a common brick after being burned, and those who had clay that would shrink more or less than other clays were supposed to readjust their molds so that the brick in its finished or burned state should be 2¼ inches thick, and the stock or pressed brick 2⅜ inches thick, and the length, of course, would vary according to the hardness to which the brick was burned, but, so far as I can recollect, the length was 8¼x4¼x2¼—something like that. The width was not supposed to cut such a great figure, because if it was a sixteenth or an eighteenth of an inch more or less it would not interfere with the designs of the architect in laying out his work, but the length and thickness are the important factors in the size of the brick, and now we have a gentleman to get up on this floor, after so long a period, and tell us that in the Empire State of our country they are bothered with the varying sizes of brick. It is true, as he stated, that some manufacturers have trouble in cases where they take large jobs and find they cannot complete it themselves, and have to call upon their neighbors to help them out. Sometimes there are large buldings going up in large cities that one factory cannot tackle, and they have got to call upon some of their neighbors. They are going ahead so fast, using perhaps 150,000 a day, and that no one plant can keep up with them. Now you see where the difficulty comes in not having the manufacturers making a brick of uniform size, how they would be bothered, and it is one of the most important things that we can consider. It has been considered, and yet it does not seem to have done the good it should. It does seem to me that the present situation, if you look at it in its true light, is one of the blackest eyes that this Association could ever have been given. I have my serious doubts if there is a city in the country where they make strictly the uniform size. I do not know what experience you all have had in this line in your cities, but, from what I have just heard from the Empire city and the Empire State, I do not believe that there is any city in the United States making a uniform size of brick. It strikes me that it is necessary for us to make new recommendations. Now, some people say that this thing ought to be remedied, not by making recommendations, but by laying down the law. Now, that thing has been considered, but I do not know whether it has been considered by us as much as by the National Association of Builders, and they have never come to the point where they thought it was wise to establish and endeavor to enforce arbitrary rules, we rather preferring to make recommendations which seem best in our judgment, which we shall ask the trade throughout the country to observe. If there is any gentleman in this Convention who can say that in all the half-dozen brickyards in his locality that they are making brick the uniform size, I would like to hear him state the fact.

President Richardson: I believe Mr. Harris is not exactly in the brick business. He is making a high grade of goods. They go higher up in the buildings, but I think he has something to say on this subject.

Mr. Charles T. Harris, Alfred Center, N. Y.: When that action was taken in reference to the uniform size of brick, ten years ago, I was a dealer in brick in the West. As I remember it, the size was 8⅜x4x2⅜, and I think you will find that the rule among the architects for press brick, and you can see why that should be so. If your brick is 8⅜, with a header 4⅛, you will have one-eighth of an inch joint, and that is essential in building. I think you will find that this is the size required by most of these users of press brick. You can see that 8⅜x4x2⅜ will give you what the architects want. I met the same difficulty that Mr. Meeker speaks of. The brick would not work to the architect's design unless some particular brick were specified.

President Richardson: This discussion on the size of brick touches, in a way, the commercial side of the brick business, and I am interested in this particularly, and last year I had this question put in the question box, but no one seems to want to talk on it. The fact is that in the East they never make a thick brick. In getting into the Eastern markets the brick is a little thinner. They run about an eighth of an inch thinner than the brick we make, and we find it advisable to cut down.

George Albertson: I think the question or proposition ought to be solved easily. If we adopted the size of common brick, and made that the standard size, there is no question in my mind but that the pressed brick men will have to follow suit I am going to give you a little experience we had in Pittsburg. We formed an Association some years ago, and called it the Western Pennsylvania Brick Exchange. One of the first things we did was to establish a uniform size of brick, the size Mr. Ittner has just told you about. We did not leave the matter there and pass resolutions that such and such should be the size of brick, but, after we adopted the size, we appointed a committee whose duty it was to visit the yards and see to it that the rule was observed. There was a penalty fixed for a man who was making his brick too large. He could make them as small as he wanted to. There was no danger of getting them too small. The committee would get a carriage and go around every month, and the Association would pay the expense, and we had a very pleasant time. We would meet a man who had his brick too large, and he would promise to remedy it, and blame it on the clay, and we would tell him that we did not care whether his clay shrunk or swelled, he must conform to the size adopted. We did that for Pittsburg for five years, and just by vigilant attention saw to it that our brick were all of one size. If one man would run out, we could go to the telephone and ask Mr. Wittmer or Mr. Dibert, or any of the brick men, to bring in a load of brick. I was going to offer a suggestion when we got home to have a little monthly meeting, get the brickmakers together, and have a little spread, and talk over the size of brick. That is the way we managed until times got hard, and first one thing and then another came up, and we agreed mutually to wind up the Association, and we have not had an Association since. Neither have we the money we had when we got together every Tuesday, and, if a man came three minutes late, he was fined a dollar; no excuse was received. We made money those days; raised the price of brick from $5.50 to $8, and had a uniform size of brick all right. Everybody was pleasant, and everything went along nicely, but, after we disbanded, we had all sorts of sizes and all sorts of prices and very little money.

F. S. NAUGLE, Warners, N. Y.

F. S. Naugle, Warners, N. Y.: Mr. Ittner was asking for the cause of the evil. I think I could give the cause in just two words. It seems to me the cause for the different size of brick is two words—indifference or penuriousness; indifference as to the size of brick and penuriousness in cutting down or raising the size of the dies. I have met men who will bring forth the argument, "My brick is larger than Mr. So-and-So's," and then figure out to the contractor the difference it will make in the laying of a thousand brick.

Mr. Evans Jones, Pittsburg: I had not intended to say a word on this matter, but it strikes me as being a very important subject. I think no one here doubts that a uniform size of brick should be adhered to. I want to say that the character of building material has been greatly perfected of late years, and it has been done by constant work. I want to say to the brickmakers it becomes a matter of honesty—that is, to the community. I want to tell of a little incident in the city of Pittsburg. On Liberty street they built a large warehouse, and used two sizes of bricks. The wall bulged out. It was built in the winter time, and the cause of this was the two sizes of the brick and the size of the mortar joints. I think the remedy is for us to come in closer touch with the architects. The architect produces nothing to put up these buildings. All is produced by some other party for him. In fact, I think it is our duty to make everything as perfect as we know how. Many times in high buildings the cracks are caused by the inequality of the thickness of the brick. Mechanically I know that. We owe it to the public, to the community in which we live, to remedy the evil if we possibly can, by coming in closer touch with the architects and builders. If this thing was published, and we got to understand it all over the country, I believe we could accomplish a uniform brick. I do not think there is any doubt about it. The question of cracking and settling of walls, and one thing and another, are often caused by too large a mortar joint and the inequality of the thickness of the material. Hence you see the great necessity for a uniform size of brick. In Pittsburg, on Smithfield and Sixth avenues, a building was put up. The inside was of rubble stone and the outside of cut stone. They had to take the tower down on account of the inequality of the setting of the mortar joints. You see this matter is very important. I do hope you will take it up with the architects and builders, that this may be remedied.

Mr. Ittner: I know it is not good form to talk twice on the same subject before every one else desiring to speak has spoken, but there is one point I do not want to let slip, and that is in regard to what Mr. Naugle has said about this penuriousness and indifference, and I want to say I think it an error. So far as my observations and judgment goes, it is not penuriousness or indifference. On the contrary, they have not got to change their existing dies to make a thinner or thicker brick, though it is necessary to change them to make a wider or longer brick, and they spend extra efforts to increase the thickness of brick, in order to excel their competitors in the sale of brick. This all of you who are acquainted with the other line of brick know. If you were a bricklayer you would look at the size of brick, and if one maker would sell his brick at a given price, and the next one would sell his brick at the same price, and the latter brick would be a thirty-second of an inch thicker than the other, that is the brick you would take, and the brick manufacturers in many sections of the country know this, and they keep on increasing the size of the brick. So I say it is not a question of penuriousness or indifference. Now, in regard to being in closer touch with the builders and architects, how much more could we have been in touch with them than we were ten years ago? If ever national bodies were in touch, we were at that time on this question. Now as to the point Mr. Albertson brought out. Of course, we can see, if such a surveillance was kept up in the different cities where brick are manufactured, it would, perhaps, be a most effective remedy, and this might de done locally, but I do not think it wouul be in keeping with the dignity of the National Association to seek to enforce arbitrary methods. I think we should remain a recommendatory body, and I am glad to see there is being some interest manifested in this subject.

ANTHONY ITTNER, St. Louis.

Mr. Snider, Canton, O.: I want information as to the standard size of brick. The New York gentleman stated that the size adopted for pressed brick was 8⅜x4x2⅜. He stated also that the size for common brick was 8¼x4¼x2¼. I want to get it correctly in my mind. In the manufacture of impervious brick we call them, not pressed or repressed brick. I want to know if there is any distinction between a repressed brick and a pressed brick. Does not the word press and repress mean the same?

Mr. Ittner: While it is not exactly the same, it produces the same results. People who make a plastic brick repress them, but we who make a dry-press brick make it in one operation, and do not repress.

Mr.Snider: We have been making the size for common brick that we understood to be the standard size adopted by the National Association ten years ago.

President Richardson called Vice President Hoagland to the chair and spoke from the floor.

President Richardson: I do not think we will accomplish anything very much in establishing a standard size for brick, common or face brick, unless we make some arrangement to bring that question up every year, and I think we ought to have a standing committee on the subject, and have a report made every year from every section of the country. Are we living up to the standard? Ten years ago we took this up, and in ten years a great many changes have been made. New men have been coming in to this Association, and a number of them have never heard about our resolution adopting a standard. If we bring this matter up every year, perhaps we will get hold of the country generally. It would be a good idea to classify the brick in some way. In many of the clays the shrinkage is so great that we cannot keep the stanard size of the brick, and the difference will be quite a great deal. We could accomplish something by having a standing committee and bring up this subject every year.

Mr. D. V. Purington: There is a great deal of meat in the suggestion just made by the President of the Association. Forty years ago, and longer than that, many of the older members of this Association, and especially those from New England, will remember the agitation of the slavery question, and it was that agitation, kept up persistently by men who believed they were right, that finally resulted in the abolition of slavery. Now, the same is true of every evil with which we are afflicted, and it is only by that sort of agitation that wrongs are righted. I want to mke one little sugestion, which I hope will meet with the approval of this Association, and that is that we eliminate entirely from our recommendations everything but the thickness of the brick. As a rule, the length, especially of common brick, and the width will take care of themselves. Get the brick so they will set properly in the kiln, and the length and thickness have to govern each other in order to get the proper space in burning in the kiln, and the width and length will regulate each other when laid in the wall.

Mr. Ittner: You are mistaken.

Mr. Thomas B. McAvoy: I think Mr. Purington is right.

Mr. Ittner: You are wrong, too, Mr. McAvoy.

Mr. Purington: If not in the kiln, in the wall. The thickness of the wall with the width of two bricks and the mortar joint cannot be greater than the length of the brick. Am I not right, Mr. Ittner?

Mr. Ittner: You are right in that one particular, so far as fine work is concerned, but that exactness is not carried out in common brick work.

Mr. Purington: It is in the kind of work we do in Chicago.

Mr. Ittner: I would not have supposed that you would have mentioned Chicago.

Mr. Purington: In short, my belief is that if we regulate the thickness of the brick the length and width would soon take care of themselves. The contractor does not care anything about the width, except in the pressed brick, but he does care about the length and thickness. The width is governed, if not in the kiln, in the wall by the length. If I am wrong I have been laboring under a great misapprehension. In our ctiy we have an Association of some forty-four members, and in that membership of forty-four, forty-three are in favor of a uniform size of brick. The one firm is a large concern, and an enterprising, active, pushing firm, and the result is we all do as we please, just because one concern chooses to make a thicker brick than the rest of us believe ought to be made. We are in a pretty bad shape. Our brick are now from a little over 2¼ to 2¾, and I will be glad if any one will tell me how we can get around it. I believe with our President that the thing ought to be kept before us all the time. We ought to keep hammering at it until all the brickmakers make a thin brick. If we can make them understand that it does not cost as much to make a thin brick, and it costs no more to set them or to lay them, and that they are easier to handle, and can be burned much cheaper, we may be able to accomplish something. I can see no objection to making as thin a brick as possible.

Mr. Meeker: The discussion has been confined entirely to an 8-inch brick. Now they are making 12-inch brick, the Roman brick and the brick known as a Norman brick. We have brick in the New York market 8½ inches thick. Now, all these things ought to be touched on. There could be a great deal of information given young architects as to the possibilities of brick work, and I think it would be a good thing for this Association to take up and publish a little book on "Effects of Brick Work," and circulate it among the architects and brickmakers. There are a great many young brickmakers who do not know all they should know. For instance, the gauging of brick. In New York we have to pay out a great deal for gauging brick, and it sometimes makes a back charge on the brickmaker, and he does not like it.

Vice President Hoagland: The next in the programme is along the same line, and I will ask the Secretary to announce it.

Secretary Randall: The next is the report of the Committee on Statistics and Value of Brick as a Building Material. They have no report, but some sugestions. That committee did a great deal of work, according to their light. They made an effort to get information, and hoped to present at this time a report that would be of real value to the Association, but they have not succeeded to a great extent. The Chairman of the committee, Mr. W. C. Ogden, of Port Dickinson, N. Y., and Mr. C. H. Merrick, one of the committee, writes as follows:

REPORT OF COMMITTEE ON STATISTICS AND VALUE OF BRICK AS A BUILDING MATERIAL.

T. A. Randall, Secretary N. B. M. A.:

Dear Sir—In regard to a report of the committee of which I am Chairman, will say that myself and other members of the committee have written about 200 letters to different parties asking assistance and suggestions, and in only one case with myself and none that I know of with the others, have the replies (what few were received) contained anything that could be used to make up such matter as I have in mind, so taking a cue from the replies I formed the opinion that the subject was not of sufficient interest or importance to warrant an expenditure of any funds, so thought I would report that fact to the Convention, and see what their pleasure in the matter was.

If I am not at the Convention you may read this letter as a report. Yours truly, W. C. OGDEN.

Port Dickinson, N. Y., Jan. 31, 1899.

Dear Brother Randall and Fellow-Workers:

But for sickness I should be happy to be counted one of your jolly crowd, and though not with you bodily yet in thought and good wishes for the prosperity and pleasantness of your gathering we shall be with you.

At your last Convention, held in Pittsburg, we were appointed one of a Committee on Statistics and Value of Brick as a Building Material. We have to report from this district practically nothing great accomplished. A large number of letters asking information and also intended to awaken interest in the subject were sent out. The responses were such as to convince us that some other method must be brought into operation in order to work out quickly the desired results. We would suggest first that your Convention broaden this question and bring within its scope every known product of clay which enters into our business.

Second—Debate every point in the resolution thoroughly and not leave it until every manufacturer present knows and realizes that this question is vital and worthy of most earnest attention.

Third—I would have the clay journals take up this subject in every issue, and sound it out over the land until a sentiment has been created that will cause the people to realize that a substantial non-combustible article is better than a flimsy, inflammable fire-trap at any cost.

We believe, through our clay mediums, that even the cost can be shown to cut so small a figure that the party contemplating building will not hesitate when he fully understands the conditions.

The newspapers of the country make the political sentiment of the people. So our clay journals (after the conventions) must take up the work and push it along on similar lines. Then the producers of everything manufactured from clay will hear the bugle note and fall in line, and the time will not be far distant when the inflammable will be almost completely superseded by the solid, substantial fire-proof construction which we shall be able to give them, and now with one more thought we close.

We believe if some plan could be devised whereby the architects and city engineers could be brought to read our clay literature we shall have accomplished more than half the work.

An appropriation by your Convention or a contribution by the clay manufacturers of the country for this specific purpose will be the best investment we can make, and in the end will crown our work with a victory worthy of the noble craft which we represent.

Syracuse, N. Y., Feb. 6, 1899. C. H. MERRICK.

Mr. George Albertson, Pittsburg: If there is anything I do dislike it is to take up a question, and, when we are right at the most interesting part of the discussion, drop it, and I do not think there is any question that could be brought up before this Convention of more importance than the size of brick, and I would like to see a motion made that a committee be appointed by this Convention from each district represented, and that this committee investigate and try to establish in the different localities a uniform size of brick, and report it at the next annual Convention.

Mr. Snider, Canton, O.: In measuring grain, fifty-six pounds make a bushel, and we know that twelve inches is always a foot. This is an established law, and why should we not establish a form for brick? Have a law or standard. I do not want, as a new member, to make this motion. I think it would be presumptuous, but I do not think it presumptuous for the Association to set a standard, and have the matter settled for good.

Vice President Hoagland: There is one point overlooked that has a little bearing on this matter, and that is the fact that men, when they start into the brick business, have never heard of this Association. Consequently, they do not know anything about the standard size adopted, but he sends his clay to the machinery man, and he tests it as to shrinkage, and the manufacturer has the machine man make him a set of dies, not only for common but ornamental brick. I think the machinery men are sometimes to blame in regard to this, for they will send you a double set of dies, and, after awhile, you will find they are too small or too large. If you have ornamental dies for dry-pressed brick, and you have a large stock of ornamental dies, you do not feel like going to the expense of having them changed. So a little could be done by prevailing on the machinery men to test these clays carefully as to shrinkage, and to recommend to the manufactureres that they make the uniform size.

Geo. H. Albertson, Pittsburgh.

Mr. Ittner: I rise in a measure to a question of privilege, that of defending the machine men. I do not think I ever rose to do this before, but I think our Second Vice President has made an unjust onslaught on the machine men. He lays a great deal of this blame on the machine men, and I think he is entirely in error. You must know something about the shrinkage of your clay. The machine men make standard molds, and send them out through the country. They do not make one machine of one size and one of another size, but they make all machines of one character, with the same kind of molds. It will go to a place where the clay shrinks a little, and it will make a brick smaller than the mold, and it will go to another place where the clay swells, and will make the brick a little larger than the mold.

Mr. Eisenhart: Mr. Ittner has said that they labored with this question ten years ago, and thought they had settled it, and, after these years, the matter comes up, and we find the size recommended at that time has not been universally adopted. Now, a man, who confesses he is not a year old, gets up here and makes a suggestion that I think is a splendid one. If we have a law that compels a man to give fifty-six pounds for a bushel, we can also have a law that will compel a man to give a certain size of a brick, and I believe, if you will put that suggestion in the form of a motion, and put in the hands of a committee whose duty it will be to see that it is enforced, it will be a good thing.

Mr. Purington: I think I have never risen in this Convention to defend Mr. Ittner before, but I want to defend him now in the position he has taken. Mr. Eisenhart would convey the impression that for the last ten years this thing has slept, but such is not the case. It has come up in every Convention. It is true that ten years ago we adopted this standard size of brick, but we have no legislative power here. We cannot do anything but resolute, but we can keep on doing that until the people will think there is something in these resolutions. If we had the power of a State Legislature or a city council we could regulate the size, but we have no power. We can, however, keep on making these resolutions until they accomplish what we desire.

Mr. Eudaly: I want to bear out what Mr. Purington and Mr. Ittner have said in regard to this question. I was Chairman of the Committee on Standard Size of Brick for three years. Just the other day, in going over my files, I found the book in which I had kept an account of the size of brick that were made in nearly every part of this country, and we got together at every Convention for three years before this size was adopted, and we have been trying to hold to it ever since, and I am in favor of any motion that will help us keep it, but I do not see how we could do anything compulsory. I question in my own mind if it would be an advantage to have a law passed to make a certain size compulsory. But we ought to have a standard size understood. Now, the architects and engineers have taken up the standard size of brick as laid down by our Association. Now, do not let us spoil that. Let us stay by that standard as closely as we can. After we adopted this size the architects came to us and said your size is all right. Now, don't let us say this is all wrong. Let us keep right along as we have. I believe the standard size as laid down is all right. The point our Second Vice President brought out is very important. We cannot always get the same identical size brick on any yard with any clay on the same machine. You cannot make a brick and put it in a kiln, I care not how you burn it, and (in a sagger you might) get them all the same size, but in any other kiln they will always vary. We may adopt a standard size, but you cannot any of you maintain it. But we want a standard size, so that when the question of a standard size comes up you can be able to establish what the standard size is. Let us keep to this all we can, but we cannot hope to keep absolutely to it. So we must be very careful how we make resolutions, and not undo the very thing we have tried so long to do. We have accomplished a great deal. We got the architects of the country to co-operate with us and adopt the standard size. Many of the prominent architects have adopted this size. The builders have followed us. So let us be very careful what we do.

—Size of Paving Brick.—

Mr. W. S. Purington: Why is it not as essential to have a standard size for paving brick adopted? If a large block is better, let us have a large block; but, if a small brick is better, let us have a small brick. If it has taken this Association ten years to accomplish this little, I think it is time the paving brick manufacturers got together and tried to adopt a standard size of paving bricks throughout the country. Blocks have rather had the preference in Cleveland, and they have gone to the other extreme in other places. These things have been brought about in the same way as with the building brick. Some paving brick manufacturer has said, "I will make my brick a little larger than any one else, and then I can beat my competitors." I would like to see this matter taken up and carried along on the same line with the building brick.

Mr. J. E. Clapp, Vicksburg, Mich.: I think this Association ought to discuss this question. We have a membership in the neighborhood of 400, and I think we will find more than 400 brickmakers outside of this Association. When the time comes that we can get all the brickmakers in the United States in our Association, they will pay attention to our recommendations, but at the present time 400 brickmakers cannot do everything. As Mr. Purington said, the tail is wagging the dog, and it don't wag well. I think it is well to get the majority of the brickmakers to adopt a standard size of brick and work to it. I think we have done well to get along thus far.

George O. Berry, Columbus, Ga.: The brickmakers in my city have come in touch with each other, and have agreed to adopt the standard size, and, in order to keep up the uniform size, we have each agreed to have a number of dies of one size on hand and change them weekly, so as not to vary the size of the brick during the whole season. In that way, if one of us should get in a tight place in filling a contract, he can call on his neighbor. In the past we had trouble in the variation of the size of the brick, caused by using the dies too long. One brick manufacturer would change his dies, while another had been working his for a month, but we have agreed to change the dies weekly, and have plenty of dies to run us, and, if we happen to increase a thirty-second of an inch, it is not felt by our neighbor.

At this point President Richardson took the chair.

President Richardson: We are going to close this discussion on Mr. Plumridge's paper by allowing him to speak to it.

Mr. Plumridge: There are two or three points I would like to bring out. This discussion was not started so much by the paper as it was by Mr. Meeker's remarks on the different size of brick. I do not know how much experience Mr. Meeker has had on the brickyard, but there is no kiln on earth that will burn the brick in it all the same size. In the down-draft kiln the top will shrink more than the bottom, and the trouble with Mr. Meeker and his associates is that they have to do a little work with the architects, and explain to them the nature of the clay, which they either won't or don't comprehend. They expect us to make and deliver a pressed brick in price and form and size to be like certain dies, and then do not want to pay for them. Now, it is impossible. I have had experience in New York city in shipping brick from St. Louis, and I know something about it. As stated before, you cannot make a pressed brick of an absolutely uniform size, and, when you come down to talking about different shapes of Roman and Norman brick, it becomes still worse. We adopted a size of Roman, 11 15-16, and we figured out exactly the same area as a standard pressed brick, so there would be no trouble, but as long as we are in the clay business we know it is useless to talk about conforming to the architect's specifications for a uniform Roman brick or a standard size of brick, and they must give us some lee way. Now, in reference to Mr. Purington's remarks. If I am wrong I want to be corrected. He stated it did not make any difference about a size of common brick, so long as you considered the thickness. If this thing was done, you might make your brick 9 inches long and let your neighbor make his 8⅜ inches long, and see who would sell the most.

Mr. Purington: I would say that the length would regulate itself in the burning. We set our common brick three over one, almost invariably, and the brick want to be long enough for three brick set on edge, with the right space for the air to pass through. I was really hoping that this would not be brought up again (laughter), for I made a "break," and I was quietly hoping that nobody would say anything about it, but it does make a difference in the length in the wall.

Mr. Ittner: Didn't I tell you you were wrong?

Mr. Purington: Yes, but I didn't believe it.

T. B. McAvoy: I don't believe it yet. (Laughter.)

Mr. Plumridge: I hope, when you come to resolute about it, you will consider it carefully. I want to refer to the paper. You may resolute all you want to, and, just as Mr. Clapp has stated, it is "the tail wagging the dog." There are 400 members of this Association, and 4,000 brickmakers on the outside. The point I want to make is, when you go home, get up a little local organization, I care not for what purpose. If you will get together, adopt a standard size of common brick and standard size of paving brick, by starting in that line and not trying to accomplish too much, I think you will get a result that is better than passing resolutions.

President Richardson: I can see quite a number of others who want to speak on this question, but, if we are going to get through with this programme, we had better stop right now, and so I am going to stop the discussion on the question, but I would like to say that I hope this same thing will be kept up and brought up every year.

Mr. J. G. Shea, Danville, Ill.: How do we stand on the size of brick at present? How many brickmakers in this audience are making brick over four inches wide at present? Please hold up your right hand. (A few of the members raised their right hands.) I just wanted to show you what the committee had to work upon. (Laughter.)

President Richardson: Mr. Purington has just handed in the following resolutions:

"Resolved, That this Association desires to emphasize the position taken by it ten years since in regard to the desirability of a uniform size of pressed and common brick.

"Resolved, That it is the sense of the National Brick Manufacturers' Association of the United States, in Convention assembled, that the size of brick previously recommended by the National Brick Manufacturers' Association be heartily indorsed."

Mr. Purington: I move the resolutions be submitted to the Committee on Resolutions.

Motion seconded by Mr. Eggers and carried.

Mr. Charles T. Harris: I have no desire to interrupt the regular course of the programme, but at the same time I have a resolution I want to bring before this Convention early, so as to have the attention of the Committee on Resolutions, so we may discuss it later. It is in line with the matter we have been talking about, the commercial side of our business. I presume some of you know that there is at present before the Senate of the United States a resolution with reference to the establishment of a department under the direction of the Geological Survey, which is brought about this way: With the enterprise and energy that characterizes our brethren in the Rocky mountain section, a committee went to Washington to try to secure the passage of a bill for the promotion of the mining interests of that section. They did not meet with any great amount of encouragement, but it finally resulted in a resolution being presented by a Senator from California calling for an appropriation for a sufficient amount to establish a Department of Mines and Mining, under the direct supervision of the Geological Survey. The appropriation named in the resolution is $150,000. As clayworkers we are especially interested in this appropriation. We have had a place in the geological report from year to year, but we have had nothing like a thorough, systematic investigation of the clay resources of this country as it should be done, and I am sure that I voice the sentiment of this Association when I say we heartily concur with the effort now being made, and that we bring our personal influence to bear on our Senators to favor that apropriation, but I think it proper as an organization to show our interest in some form, and I therefore present the following resolution. (See report of Committee on Resolutions.)

President Richardson: This resolution will go to the Committee on Resolutions, and I will now announce that committee.

—Committee on Resolutions.—

J. W. Carson, LaPrairie, P. Q., Can., Chairman.
F. W. Meeker, New York City.
F. C. Manson, Boston.
H. W. Gerke, Quincy, Ill.
L. C. Besley, Council Bluffs, Iowa.
G. O. Berry, Columbus, Ga.
Robert Nesch, Pittsburg, Kan.

While we are out of the regular order of business, we may bring up an invitation from the Columbus Builders and Traders' Exchange. We have a very nice letter from them asking us to visit their quarters and to partake of their hospitalities. It may not be known, but the Builders and Traders' Exchange of Columbus have very fine quarters, and it would be very pleasant if we could visit them.

Mr. Eggers: I move that the invitation be accepted, with thanks.

President Richardson left the chair, and Vice President Frank McAvoy presided the rest of the session.

Motion was seconded by Mr. Ittner and carried.

Secretary Randall: Next on the programme was to have been a paper, "Real Versus Imitation Fire-proofing." The matter was taken up in good time by the Secretary, and the parties were to prepare a paper, but, unfortunately, two were interested, and neither could get to the other. I will exonerate Mr. Dennison from any intention to slight the matter, but, as a fact, he has no paper, and Mr. Wolfley, who was to lead the discussion, is not present, so we will take up the next, "Burning Brick in Down-draft Kilns," by Robert Twells, Wickliffe, O.

BURNING BRICK IN DOWN-DRAFT KILNS.

Mr. President and Gentlemen of the Convention:

My object is not to make a brilliant speech or to tell a lot of stories, but if I can succeeed in dropping a word that will help anyone of these brethren who has come a long distance, at great expense, to attend this Convention, and as traveling homeward they review what has been said if they shall be led to exclaim, "I am well paid for going, for I have received light on the very subject I wish to know," or if I could give a helping hand to some poor struggling clayworker, whose feet have sunk in the mire and clay, and who is putting in his time and money, or some one elses, in manufacturing clay ware and passing them through the kiln, only in turn to be thrown on the rubbish pile, I shall be well repaid for my effort.

I do not claim for one moment to know it all, or that what I have to say is infallible, on the contrary, I know that there are lengths and depths and heights that I have not attained, but this one thing I do, leaving those things that are behind I press earnestly toward those things that are before. Of course what I am about to advance is my theory, and I believe it with all my heart, but I assure you that I am too interested in knowing the truth to care about my theories, and if you think any of them are weak in the knees or spine, and you think that you can show a more successful way, I hope you will speak out, not only for my own sake, but for the sake of those who shall hear or read this paper. All that I wish to do is to open the discussion and throw out a few ideas which shall become the text for others to preach from. I suppose, like all other preachers, I must divide my subject into, firstly, secondly and thirdly:

In the first place I will take up the water-smoking question, which is as important as any other part of the process, if not more so. We will take for granted that the kiln has been set so that it will have an even draft in every part, and will draw the dampers out wide open, for if ever a kiln needs good draft it does until all steam is out of it. In lighting the fires we will be careful to place the coal on the far end of the grate, so that the air drawing in will carry the smoke and heat with it, whereas, if we started the fire on the front end of the grate the air would draw in behind the fire and blow the smoke and blaze out. If we are using soft coal to water smoke we should be very careful to make as little smoke as possible, or the spaces between the bricks will become choked partly, if not entirely, and when the kiln commences to get hot and the soot commences to burn out it will do so where the draft is the strongest, and will eventually be the cause of an uneven burn, from no other reason than the kiln was water-smoked with soft coal. It is also liable to cause the kiln to take a day or more longer than it would, as it takes longer for the fire to get to the bottom when partly choked up with soot. Soft coal will do for some of the coarser wares, but when burning a high-grade facing brick some other fuel is very desirable, if not absolutely necessary. No fixed rule can be made as to how fast or how slow a kiln of brick can be water smoked. This will depend on what kind of brick we are burning, and the kind of material they are made of, but it is safe to say that we must go slow enough so as to not make steam faster than the stack is capable of carrying it at once away. Be sure to not go so slow as to not release any steam or have such small fires as to not create warmth enough to make a draft, and the little steam that we do make lingers in the kiln, spreading itself out and allowing a scum to settle on every part of it and thus whitewashes every brick and sometimes softens down the bottom courses, not because the kiln was water smoked too fast, but because it was fired too slow. I regard this as a very important point, and believe it occurs much oftener than we are apt to suppose. I consider one of the greatest helps to a water-smoking kiln is to have a hot kiln on the same stack. We will now suppose that our kiln is succesfully water-smoked, and that as soon as the kiln is thoroughly dries through we will detect it, whether it has taken one day or a week, and will not go on and be water-smoking hours, and, perhaps days, after steam has long since left the kiln.

"Getting the ware hot through to the bottom of the kiln." This must be done without once bringing the top courses to a settling heat. Indeed the top and bottom courses should never vary above one or two shades in color, for when the bottom shows a dull red the top should not show more than a light cherry red, and later on in the process the bottom will often show the hottest. We must be very careful never to create more heat than the ware is able to absorb. A kiln is like a little child, it cannot speak, but it manages to make us know what it wants. When the fire commences to burn thin they commence to ask for more fuel, while if the furnace holds the desired heat it plainly says, "please don't feed me any more, I have got all that I can digest at present." On the other hand, we should be very careful not to allow the kiln to repeatedly draw cool between firing, as this is so much time, fuel and labor thrown away. We are often asked, "How long does it take to burn a kiln?" That depends on how quick you can successfully water-smoke your ware, and how fast you can get it hot through to the bottom without overheating the top. This will depend on how good a draft you have, and how well it is followed up in the firing. So you see the best burner is the man who can so manage his fires as to get the most heat to the bottom without hurting the top. A kiln should have large enough furnaces to supply an abundance of heat at the required temperature, as there is hardly any limit to the volume of heat we can pass into a kiln at this stage of the burning without hurting it. If in the future the time of burning a kiln shall be reduced I claim it must be gained after it is water-smoked and during the time it is being brought to a settling heat. If we have a great big stack pulling at our kiln and only a few little furances which we dare not run up to only the temperature we need, the volume of heat is altogether too small in comparison with the outlet, consequently the kiln fills up with heat very slow, causing great loss of time and fuel. A kiln that has a very strong draft is liable to make the fire shoot down in spots where the draft is strongest, and as heat will naturally draw to heat the cold places fall further and further behind, until when finished it is found to be an uneven burn all because of too sharp a draft. A very strong draft during the latter part of the

Robert Twells, Wickliffe, Ohio.

heating-up process when the kiln is beginning to get hot to the bottom is a positive loss and injury in many ways. From this stage on to finishing, if the fires will just draw in without smoking out on first being fired, the draft is just right, and you will have an even burn and not use any unnecessary coal. Facing brick will require a little stronger draft than paving brick, as no flame or smoke shall be allowed to linger among the brick, and we shall be very careful never to pry up a green fire, causing a lot of flame and smoke; if we do we will fire flash and stain the brick. To avoid that we should so fire as to cause as little smoke as possible, and our draft should be so that our fires should burn clear but not roar as though a hurricane had struck them. We will now suppose the heat is getting down to the bottom of our kiln. Now righ here lies one of the secrets of having good hard brick in bottom courses. If we will wait until all the dark spots and shadows are gone out of the bottom peephole before we commence to settle the brick, and for the first three or four inches of the required amount of settle we only settle it at two-thirds the ordinary rate. To illustrate: Suppose we decide that three-eights of an inch in two hours is what we consider the best rate to settle our brick, then it is best for the first few inches to only get one-quarter of an inch in two hours. The kiln should be brought up to a settling heat as gradually as possible, indeed the kiln from the time the steam is out of it until it has reached the desired rate of settle it should have one continuous increase in heat until it commences to settle without any extra heavy firing. Indeed it often happens that we have not to fire so hard during the settle as we did during the latter part of the heating up process. A man to be a successful burner must not fly from one extreme to another, now firing with all his might, and then again not firing at all. This brings us to the third part of our subject, namely:

"Settling the kiln." Our rate of settling each two hours will depend on how much our brick will require to settle altogether. If our kiln is set thirty courses high and fourteen inches is settle enough, then three-eighths of an inch in two hours will likely be the best. But suppose the thirty courses will require seventeen inches, then one-half inch in two hours would in all probability be right. But again suppose the thirty courses would only require eight inches settle, then one-quarter of an inch in two hours would most likely be the right rate. But perhaps some one will ask: "How is it that if the one requiring seventeen inches be allowed to settle one-half inch in two hours, why cannot the one requiring the eight inches be settled one-half inch in two hours?" One reason is that the one requiring seventeen inches settle will settle at that rate with as little heat as the one requiring eight inches settle would settle at the rate of one-quarter of an inch in two hours. But another and more important reason why we cannot settle the one requiring only eight inches, one-half inch in two hours, is that it would only require thirty-two hours to settle the kiln, and that would not give time enough for the heat to work down to the bottom, and the kiln would be found to be too hard on top and too light on the bottom. Again, the brick that would require only eight inches settle show that they are a dense body, which the fire cannot equally penetrate, and if we force a fire on them faster than they can absorb it we will burn them up on the outside, while the inside of the brick will not be as hot. The brick will be like a big man in a little coat which he is bursting out under the arms and across the back. So a brick with the outside suddenly shrunk will have to burst somewhere, as it cannot encase the unshrunk core without doing so, while if time is given for the heat to fully penetrate the center it will shrink in proportion to the outer side of the brick and no checks will appear. We should measure our kilns often enough to keep track of them. We should see that every furnace is doing its share and no more; in orther words, our fires should be all of an even temperature. Having once gained a point on a kiln we should never let it fall back. When once a kiln has commenced to settle at the desired rate the rate should be kept up until possibly when we are getting the last two or three inches. When the material has shrunk all it is inclined to, if we cannot get one-half an inch we must be willing to take three-eights, and if it is three-eighths we are trying to get and we cannot get it without firing harder than we have been doing during the settling process, we must be willing to take one-quarter rather than fire any harder, as firing harder simply means a burnt-up top. We must not put too much confidence in settle, for while it is one of the best things to enable us to determine when the kiln is finished, yet there are many reasons why it can deceive. We should always take our first measure as soon as the kiln is done water-cmoking, for as the brick get red hot through they commence to rise, and if we take our first measure during the rising process it might cause the total setle to deceive us. Again, it often happens that some of the different stratas in the clay bank shrink more than others. If some brick made from the strata that shrinks most should be set under our measuring hole, and we were guided by them, not knowing they were there, they would deceive us, and they would give us our desired total settle, and yet when the kiln is emptied it would be found to be light, while on the other hand, if some brick made from a strata that shrinks very little should, unknown to us, be set under the measuring hole, it would deceive us, as we should be firing and trying to get our usual total settle when the material from which we were making our calculations would not shrink that amount, and our kiln when opened would be found to be burnt up. Again, the brick are liable to swerve which would give a false settle. If you can find a kiln that would draw down even in every part of it that kiln can be water-smoked quickly and the fire can be got down to the bottom quickly, for the reason that you can use more draft. A good draft is a great help if the firing is followed up, but if allowed to draw cool, a sharp draft will run away with the heat in a very few minutes, causing great loss of fuel. To sum up the conclusion of the whole matter, if you want a poor burnt kiln, water-smoked faster than the stack can carry the steam away, fire harder than the ware can absorb the heat during the heating-up process, and commence to settle your kiln before it is hot through to the bottom. The liability is that after years of toil all you will have to show for your labor will be a hole in the ground. You will be like the poor unfortunate that Frank L. Stanton writes of:

His hoss went dead and his mule went lame,
He lost his cows in a poker game,
A hurricane came on a summer's day
And carried the house where he lived away;
Then an earthquake come when that was gone
And swallowed the land that the house stood on,
And the tax collector he came round
And charged him up with a hole in the ground.

But if you will take head to what I have said, even though you may be as low as the poor unfortunate, with only a hole in the ground, yet it shall be said of you as it was of him:

Did he mourn and sigh, did he sit and cry,
And cuss the hurricane sweeping by;
Did he grieve that his old friends failed to call
When the earthquake came and swallowed all.
Never a word of blame he said
With all them troubles on top of his head.
Not him; he climbed on top of the hill,
Where standing room was left him still,
And bearing his head, here's what he said,
"I reckon its time to get up and get,
But, Lord, I ain't had the measles yet." (Applause.)

—Burning Brick, General Discussion.—

Vice President McAvoy: This is the time for discussion of burning brick in down-draft kilns, which is now the modern method in this country. If there is no discussion on this valuable paper we will pass on to the next.

Secretary Randall: There are two or three questions relating to the same general subject. First, "Is it possible in practice to get perfect combustion in fuel?" Is any one prepared to answer this question?

Several Members: No.

Secretary Randall: The next question is along the same line. "Is it practicable to use pyrometers in brick burning?"

Several Members: No.

Secretary Randall: The next is also on the burning question. "Which is the most exact method of burning—settle test pieces or Seger cones?"

Secretary Randall: The gentleman who is best prepared to speak on this question is attending the other Ceramic Association. I will add here that the Ceramic Association has on its programme some very elaborate and interesting papers bearing on this very topic, and these papers will be published so that those interested can get the information desired. Prof. Orton can probably furnish copies of the papers in due time.

Mr. Sibley: In response to that eighth question I would like to give you a little experience we have had as paving brick manufacturers. We have found it depends a great deal on the point from which you measure the settle. When we first began burning by the down-draft process we first measured our settle from the top of the kiln, and we found that this was, to a greater or less degree, inaccurate, and then we adopted the plan of setting our peep hole from the bottom of the kiln, just six inches high, and then, at stated intervals, we put in a pillar of fire brick, from which all the shrinkage had been taken out by previous burning, and we measure the settle by the first brick pillar from the bottom of the kiln. Now, to save an overburn from the top of the kiln, at stated intervals in setting we take a large test piece from the top to govern the firing in the top of the kiln, and measure from these fire pieces in the bottom.

Mr. Purington: I want to say that it seems to me very strange that at the conclusion of the paper we have just heard there was so little discussion, and I think the impression is that the ground was so thoroughly covered and the system so thoroughly explained and so met the views of all of us that there was very little to say. I think of all the papers that have been read there has been none more practical than the one Mr. Twells has just given us on burning brick in down-draft kilns.

Mr. Carson: I wrote a few thoughts on the subject and thought I would read them in answer to this question, but Mr. Twells brought out the idea I was trying to convey. However, it is short and I will read it.

Mr. J. W. Carson: In my opinion, test pieces are best—that is, pieces of the same material as that being burned. My reasons for thinking so are because they are reliable in all cases, while you cannot rely on either settle or Seger cones, except in cases of absolute uniformity of materials. I have had quite an experience in practical brick burning, and this opinion is the result of that experience. I have burned a variety of shale that, instead of shrinking, expanded so much that the bricks when burned would not go back into the mold in which they were made. These were not swelled bricks in the common acceptation of the term, but were perfectly-shaped dry-pressed bricks, and went into the building as No. 1. In this case either test pieces or Seger cones would fill the bill, but settle was out of the question. There are many manufacturers of pressed bricks who are obliged to mix different clays, either to overcome some natural perversity, or to obtain a merchantable color. Now, it depends on how intimately and accurately this mixing is done whether settle or Seger cones will do as a guide, but test pieces are a sure indication of the progress of the burning. Even supposing the mixture is all right, and you know the number of the cone or the inches of settle required, or the age of kaleidoscopic changes, your specialty may be out of demand and another to be worked up and its peculiarities determined. The test pieces are at your hand any time, and cost nothing. There are very few yards that have a perfectly even material, some having as many as five or six stratas of different natures, each with its peculiarity. These have to be mixed as evenly as the price of the bricks will allow, which often means very carelessly. I do not think Seger cones would do here, and settle might be very misleading. Some yards make a specialty of shades in bricks, obtained by mixing fire and common red clays. The heat required varies with the mix. I do not think anything can be as good in this case as test pieces of the same material as that being burned. Take the yard, for instance, with which I am connected at present. We burn by test pieces entirely, but watch the settle closely to insure an even burn throughout the length of the kiln. We have put kilns out on four and one-half inches of settle, and again have gone twelve inches, both burns being equally good. This difference is caused by the uneven nature of our material, shale, and the manner in which it lies, being on a flat prairie, without, or almost without, drainage, making it a very expensive matter to work from a face, which would certainly be best if practicable.

Now a word about the test pieces, a sample of which I hold in my hand. These are made by simply cutting about one-third off the bricks taken as they are being set, or damaged bricks can be used, taking care to get about the run of the kiln. These are taken out at different stages of the burning near the finish, and the kiln closed up when the flat piece denotes that the bricks have had enough. Now, gentlemen, I try to be a progressive brickmaker, and am willing to use anything that will lessen the cost of manufacture or make good results certain. There are, I have no doubt, places where Seger cones or plain settle are perfectly reliable, but in cases like I have just mentioned, I think test pieces are the best for general-purpose brickmaking. Of course these remarks apply to closed kilns—down-draft and continuous only. Burners by the up-draft have as guide the settle and the heat appearance on the flatting, which are very reliable when you understand them. There is, however, no good reason why test pieces could not be used on these kilns, in many cases advantageously, if the burner thought he needed them, or by any burner if he was burning a strange clay.

Secretary Randall: We have one more question. "Are vitrified building brick in any way superior to those not vitrified?"

Mr. D. V. Purington: If you want to use them for scouring knives, those not vitrified are superior to those vitrified. (Laughter.)

Mr. Gerke: I move we adjourn till 2:30 this afternoon.

Motion seconded by Mr. W. S. Purington and carried.

THIRD SESSION.

Wednesday Afternoon, Feb. 8, 1899.

Convention was called to order by President Richardson.

Secretary Randall: The first thing in order this afternoon is a paper by Mr. Morrell, entitled "What I Don't Know About Brickmaking." Mr. Morrell is not able to be with us, but he has sent his paper, which I will read.

WHAT I DON'T KNOW ABOUT BRICKMAKING.

Mr. President and Gentlemen of the Convention:

My first thought on receiving the honor of an invitation from your Secretary to contribute something to the programme for the entertainment of the Convention, only stipulating that it should be something bearing on the brick industry, was to draw on my experience of half a century in the business to tell what I know about it. Finding my fund of facts, none of which I was very sure, exhausted in half a dozen lines, it occurred to me that "What I Don't Know About Brickmaking" was a subject much more capable of expansion, as indeed the records of the addresses of former Conventions abundantly testify. As all I don't know about it would occupy more time than is devoted to several Conventions, I shall only mention a few of the salient points on which my ignorance seems most phenomenal, and which has been confirmed by many years of experience and observation.

As a history of brickmaking and the important place it has occupied in the development of man would be nothing less than an epitome of the progress of civilization, I have always hoped that some antiquarian genius would come forward with a paper on "The Ethics of Brickmaking." There has been much speculation on the probable way, and for what probable purpose, the first bricks were made. It couldn't have been long after man first began to build fires before he discovered that clay was made harder by burning, and according to the scientific theories of evolution even the most primitive man would have learned in a thousand years or so that mud could be shaped into blocks and then be made useful for various purposes. But this fact must have been discovered long before mankind could have advanced in knowledge sufficiently to have had any use for such things, according to our standard of usefulness.

In some antiquarian societies the fact is still unsettled whether the brick or brickbat was created first. Of course, to be consistent with the development theory, the brick must be admittedly a step higher in the order than the brickbat, which would seem to demonstrate that the brickbat must have been created first, and as recent discoveries seem to go to show that in municipal misunderstandings in primitive time the brickbat was evidently one of the most efficient and handy articles for settling disputes, the balance of the argument seems to be rather in favor of its precedence in the order of development. However, as bricks were evidently in use long before any recorded history, this point will probably remain unsettled, with the multitude of other things not known about the business.

That the brick in its very nature has been a prominent factor in the civilization of mankind there can be no doubt about. If there is one thing on earth that can claim pre-eminence in the elements of permanency that thing is a hard-burned brick. Civilizations, one after another, have developed, ripened and gone to decay as the ages have rolled away, leaving as the most conspicuous and best preserved evidence of their existence the solid bricks they made.

It is a somewhat singular fact that among all the discoveries in regard to the business in the past ages of one thing we are still left in the dark, and that is—did it pay?

The first great brickmaker of whom we have any authentic record was a man by the name of Pharaoh, but we know nothing of his success financially, as he was largely engaged in other business at the time. As he could settle the labor question to his satisfaction, and had a monopoly of the market, he seems to have been favorably situated for making something out of it while it lasted; but one day he found himself without a crew, and it is probable that his profits and product were sensibly diminished after the first great walking delegate made him a call. The days of large profits probably ended about that time, as there is no record of such a state of things since for a length of time of sufficient extent as to be considered a permanent condition. It may, perhaps, be considered a little far-fetched to attribute the present depression in the business to Moses; but as the world seems to have taken a new departure with Pharaoh's brickmakers, and Moses was the first great labor agitator, the theory seems quite as tenable as many others advanced by modern political economists.

WM. MORRELL, Gardner, Me.

The history of the brick is unique, and has no parallel in that of any other business. We can trace adown the ages the development of the ocean steamer from the primitive dugout, and the modern palatial residence from a hole in the ground; but the brick was a brick or brickbat from the start, differing in no essential points from the brick of to-day. The most durable of building materials, it always has and probably always will occupy a prominent place among the vestiges of bygone civilizations as the world grows old and other evidences of what has been become obliterated. In no other building material is the process of manufacture so simple or the stock so plentiful and widely distributed. The introduction of machinery for the manufacture of common building bricks has neither materially reduced the cost or improved the quality, nor does it seem to have much changed the character of the business in other respects; and it is in connection with this latter that the things I don't know seem to strike with the greatest force and frequency

Here is an element lying around loose, comparatively worthless, which by the hardest kind of honest labor is transformed into an article of universal utility, and which when used adds permanent value to the wealth of nations. It isn't a thing that is valuable at the time used, but becomes worthless in a few years, and is a dead loss finally. When properly made and properly laid it is there to stay forever. There is no sham about it. It can't be adulterated, and ten hundred and nothing less make a thousand every time. This has been a characteristic of the business in all times and in all places. Another equally prominent and universal peculiarity is that as a whole they have never paid the cost of manufacture. One would be safe to give long odds on a bet that the bricks of which the city of Boston is built, if the facts could be known, haven't paid in the past the cost of making and burning them, nor are they doing so to-day. There isn't a big brickyard in the vicinity of that city with which I am acquainted that hasn't sunk at least its original capital, while the almost universal history of the small brickmakers shipping from along down the coast of Maine is that they commence poor, live poorer, and die poorest.

In the great and growing West, where everything is done on a colossal scale, and we naturally look for improvement in methods, we hear from all directions the old familiar cry, "It don't pay."

In viewing the history of the business from an ethical standpoint, the most interesting study would be the development, not of the brick, but the brickmaker. There is some doubt, however, if he ever was developed. It would almost seem that he was made originally just as he is now, like his own brick, solid and unchangeable. He can't seem to get it through his head that bricks can't be sold at four dollars per thousand which cost five, and have much margin of profit. By the same arithmetic he will always make a million bricks where but five hundred thousand are wanted.

Now one of the important things I don't know is, why it has never occured to those in the business to charge more for their bricks, and when the market is overstocked to make fewer of them.

In all the so-called improvements in manufacture the aim has always been to make them cheaper, which in this part of the country means cheap labor, with its natural corollary, cheap laborers. In the vicinity of the large cities the work is being done mostly by the jailbirds of all Europe, while in the smaller towns and villages throughout New England the labor has been almost wholly monopolized by Canadian Frenchmen. This change from the former condition, when the labor was performed by the sturdy, honest and respectable natives of the soil, hasn't been one to elevate the moral tone of the communities in which the business is carried on, nor has the tendency been to increase the profits of the proprietors.

Another thing I don't know is, why the National Brick Manufacturers' Association, representing as it does the wit, wisdom, talent and capital of so large a part of the brickmaking interests of the country, don't rise in their might and develop some scheme by which the business can be controlled or managed in some way that a good, square, honest brick may be sold, and sold only for a price which will give something like a fair compensation for the good, square, honest labor that has been put into it. Any sort of a combination, agreement or trust that could bring about and maintain such a state of things would be justifiable, as I think the facts would show that no honest and necessary business has been run with so universally discouraging results as the brick business. It seems to be the nature of the business to be overdone, and notwithstanding the fact of which we see and hear evidence on every hand that bricks are coming more and more into use every day, and will continue to do so in the future, it will continue to be run on the same plan of ruinous competition and uncalled for production, until some system of control can be contrived for its regulation on a basis of common sense and business principles. (Applause.)

—The Penalty of Referring to Pharaoh.—

Mr. Gates: I had never thought I would be pained by having to call attention to a fact such as I have to-day. Of course, there is no question about the fine being incurred, it is so evident, but the question in my mind is in the individual offending not being present, and we don't know whether he has any property in the State; he cannot be reached by an attachment. The case is a clear one under the law of our Association, and I believe that the Secretary ought to pay the fine. (Laughter.)

Secretary Randall: If I do you will have to raise my salary.

Mr. Gray, Saco, Me.: I move the Secretary's salary be doubled. The Association can afford this inasmuch as he gets no salary at all. (Laughter.)

Mr. Eudaly: That matter is settled. The Secretary pays the fine. I want to say a word right here, and I want it to appear in the records that the National Brick Manufacturers' Association is not organized for the purpose of controlling prices or creating a trust. That is all I have to say.

Mr. Ittner: In connection with the remarks Mr. Eudaly has made I wish to make a few remarks, and be about as brief as he was. While, of course, I do not think it is wise or the best of policy for us to discuss the formation of trusts or anything of that kind, yet I desire to be distinctly understood in the opinion that if any member of this Association has a suggestion to make whereby our condition can be benefited there is no law against it, and it is no crime.

Mr. Eudaly: I heartily concur in the last remark.

President Richardson: The Secretary will read the next.

Secretary Randall: Next number on the programme is "New Method of Testing Paving Brick,' by Gomer Jones, City Engineer, Geneva, N. Y.

A NEW METHOD OF TESTING PAVING BRICK.

Mr. Chairman and Gentlemen of the Convention:

Having occasion during the last year to report to the Board of Public Works of Geneva, N. Y., on the quality of numerous samples of paving brick, I examined a great number of tabulated tests, and was struck with the fact that they had but one point of similarity, viz.: The impossibility of drawing from any one test conclusions which would be supported by the mass of other tests.

I found that but few engineers had complied with the recommendations of this body as formulated by your commission and presented at your annual meetings, and even when compliance was intended some variable quantity had crept in which made it impossible to bring the various tests into harmony. I was compelled, therefore, to abandon the data presented and establish a starting point from which reliable and equitable conclusions could be reached.

This starting point I assumed to be the formal resolutions adopted at the Buffalo meeting of the N. B. M. A., in 1897, which declared: "That in the opinion of this Commission any paving brick will not absorb sufficient water to prove injurious to it in service. will not abosrb sufficient water to prove injurious to it in service. We, therefore, recommend that the absorption test be abandoned as unnecessary if not actually misleading; also,

"Whereas, From the experimental work done so far by this Commission or by others so far as known to us ,in application to the cross breaking and crushing tests to paving bricks, it is not possible to show any close relationship between the qualities necessary for a good paving material and high structural strength as indicated by either of these tests.

"Resolved, That for this reason the Commission recommends that these tests shall be considered as purely optional in the examination of paving material and not necessary as a proof of excellence."

The rattler test remains as the one guide in intelligent selection of material for paving, and it would be infallible if by careful treatment of the mechanical problem involved we are able to eliminate the lements of chance and subject all the material to uniform treatment at the same time.

The rattler test proposed by your Commission does not do this, because it has been found that only one kind of brick can be rattled at once with uniform results. The abrading material used, viz., brick of the kind tested, has not the same efficiency when a fire clay (which is granular) is used against fire clay, as when shale is used against shale. Weight and form also are factors which cannot be disregarded. The lighter brick—though more numerous—to make up the fifteen per cent. volume of the charge—do not strike as heavily as larger brick. Then again changes of form take place during the test, and the brick which soonest assumes the rounded form will soonest attain its maximum point of resistance, so that its ultimate wearing qualities, as shown in the tabulated result, will be entirely out of proportion to its economic value.

It is possible to formulate conditions and coefficients to meet the necessities of any mechanical problem, but in order to do so a long series of experiments must be patiently and carefully conducted, and each element must be given its true value, and even then the application of the same formula by different engineers often leads to widely divergent conclusions.

How can we best reduce the element of chance, do away with all formula that may be controverted and make the test absolutely uniform? I am aware that the answer has been long sought by many in this body, but pardon me for saying it, sought from an unfortunate and ill-considered standpoint, in that they subjected their material to a test which does not reproduce the conditions of actual use on the streets.

I desire to present for your consideration a new method of testing. One that has for its fundamental principle the substantial reproduction of the blow of the horses's foot and the rolling wear of the wagon which follows.

The machine is a rattler with the usual driving gear and accessories, differing from the ordinary rattler only in that instead of plain staves it is provided with staves having two longitudinal pockets each, in which the bricks are inserted and held end to end. These pockets are three inches deep (leaving about one inch of the brick protruding). When all the staves are in place the interior of the rattler is virtually solid brick lined. During rotation the attack of the abrading material is at right angles to the length of the brick, and confined to the surfaces and edges which are exposed in actual use; there is sufficient space between the brick for the escape of any dust or waste, and incidentally to allow the abrading material free access to the unsupported edges of the brick under test, thus reproducing the conditions of position and line of wear found when brick are laid with sand filler in the street.

In selecting abrading material the first point to be decided is the amount of wear or abrasion desirable. My opinion is that the abrasion should be of such amount that at the end of the test the weakest brick shall be in a condition similar to that in which brick worn out on the street are found.

I will not enter into details of the extended experiments that led to the adoption of a cast iron cube one and one-half inches square, weighing eighty-seven hundredths of a pound, as the unit, and one hundred and fifty pounds of such cubes as the charge, but will simply state that when subjected to three thousand revolutions bricks considered standard lose five per cent. of weight, and would be condemned if found on the street.

Having before us a brick lined rattler, containing a charge of one hundred and fifty pounds of iron cubes, and driven at the rate of twenty-four revolutions per minute, let us analyze the mechanical action and forces. First, the ascending side of the rattler carries up part of the charge of cubes, imparting to them its velocity, and when carried beyond the center they are thrown toward the opposite side of the rattler chamber, and therefore strike upon the unprotected surface of the brick. chipping the edges, cutting into the surface and doing all that the calks of a horse's shoe can do. Second, as only part of the charge of cubes can be carried upward by the ascending side of the rattler chamber the rest slide and roll over the surface of the brick at the lowest point, grinding and wearing them away.

Thus we have:

First—Brick in position as in the street.

Second—Continual raining of iron cubes upon the surface—analagous to the blow of horses' feet.

Third—Attrition and rolling wear as of wagons.

Fourth——Wear confined to the narrow curface of the brick—as in the street.

Fifth—Uniform and standard abrading material.

Sixth—Like conditions for testing any material from fire clay to shale.

Seventh—Influence of change or form minimized.

Eighth—Weight, cross section, form and structure given their true value—as they are all reduced to surface, and resisting quality of material.

Ninth—As only one edge is subjected to abrasion it is possible to multiply the loss of weight suffered by one brick by the number required to lay a yard and thus ascertain the number of pounds of material that would be lost from a square yard of pavement laid in the street.

We thus reach the knowledge most to be desired, namely, the loss of weight per square yard; the only consideration modifying the finality of this result is the character of the wear which the bricks would show both when laid in the street and under the test. Some bricks chip on the edges, leaving the surface as a whole intact; some become rounded, producing a washboard street. It is not my purpose to consider at present the relative merits or demerits of material as indicated by the character of the wear, but simply to note in passing that by the use of this method it is possible to ascertain the character of wear absolutely and definitely in the laboratory without waiting for the verdict of the streets.

Added to these conditions, it is possible to test any number of kinds of brick up to sixteen simultaneously. When the test is started the operator cannot change the result.

I will describe a test made by me last year at Geneva, N. Y. Samples were submitted by ten manufacturers:

Having such diversity of material, sixteen in all, in order to eliminate the weakest I put two of each kind of brick into staves which were then bolted to the heads, and having put in one hundred and fifty pounds of abrading cubes, the machine was closed and given three thousand revolutions. The result was that while the strongest material lost less than three per cent., the weakest lost seven and thirty-five one hundredths per cent., and an interesting fact was disclosed. All the wire-cut brick failed to develop as much strength as the same material repressed. In one instance the difference of abrasion was as between three and fifty-nine one hundredths per cent. in the case of repressed brick and six and twenty-six one hundredths per cent. wire-cut brick. The large fire clay block also failed in comparison with the smaller repressed fire clay brick, and therefore wire cut and large fire clay block were dropped from consideration. It may seem a rather summary procedure to reject material on such a slight data, but extended tests made later justify it.

Having eliminated all but eight varieties, I put four pieces of each kind of brick into the machine, and having given it three thousand revolutions, the brick were taken out and weighed. Having thus ascertained the percentage of loss, while in a dry state, the next step was to test for abrasion after absorption. The brick with one side abraded were put into a tank with an equal depth of water over each and allowed to remain one hundred hours. After weighing they were placed in the machine with the unabraded side up. After testing it was found that the rate of loss was practically the same as when tested dry, thus supporting the conclusion of your Commission that the rate of absorption does not seriously affect wear.

I would call attention to the fact that the rate of abrasion as between the wet and dry bricks can be obtained by the use of this machine on test of the same identical brick, as only one edge is used at a time, and on the second test the abraded side is put into the pocket in the stave.

The result of these tests combined was adopted as the rating of the brick. The fact was developed that shale stood the test better than fire brick. Our Board of Public Works was of the opinion that both shale and fire brick should be used on our streets, therefore we requested makers of brick selected to furnish us two hundred brick to establish a standard for acceptance of shipments. The rating of material was in the order named. Only one of the materials held its original percentage on this acceptance test, but the difference was not great enough to disturb the relative position of each.

Having established a standard bricks were daily taken from the street, car or wagon, without selection ,and subjected to test; thus we were assured that the material delivered was uniform in character. This daily test took time and patience, but the result warranted the outlay, and it confirmed the fact, established by testing the two hundred sample brick referred to, that only one material kept up the average of the original samples furnished. This I am satisfied was accounted for by superior care in shipping, and not by willful deception in selecting the original samples.

I shall be pleased to exhibit to those interested half a charge of a recent test in which three kinds of brick were pitted against cut Medina stone block.

The losses were as follows:

Shale block No. 1, 2.46 per cent.
Medina stone block, 3.61 per cent.
Fire clay block No. 2, 3.2 per cent.
Fire clay block No. 3, 4.6 per cent.

This charge shows the various kinds of wear, also that the action of the cubes is that outlined in this paper, and supports my contention that the new method of testing brick is impartial, certain in its results, and worthy of consideration on the part of this body, and of all who wish brick paving to gain an unassailable position before the people. (Applause.)

President Richardson: This paper is open for discussion.

Mr. Ittner: I would like to hear from Professor Orton on this subject.

Professor Orton: Gentlemen, I have a paper to present along this same line a little later in the afternoon, and I do not know that I care to go into any discussion of Mr. Jones's admirable paper at this time, further than to say that I regard it as a most valuable contribution to the literature of the subject, and one to which I have listened with a great deal of pleasure. I had a preliminary talk with Mr. Jones ten days ago, and had a crude idea of his method and the general nature of his process, but had no further opportunity to learn how his results came out. In my judgment, the value of his new method will depend solely on whether it does discriminate better than the present standard as to the value of paving material, and if no essential difference can be detected between the results of his method and that adopted by the Association, then the question comes as to which is the easiest of application and most economical to the man making the test. It would be premature for me to say one way or the other as to the real value of Mr. Jones's method. I do not know anything about it. I do not think anybody here knows anything about it except Mr. Jones. I think we ought to take early steps to compare this process with our own standard process, with material which we shall select jointly from the same source at the same time, and if the two processes, after being tried side by side on the same material, further show any difference or discrimination in favor of the new method, then, I say, let us abandon our old method and take this new method for this Association, for if it is going to have any weight in the scientific or business world it must stand purely upon the question of merit. It is not a question of personal feeling or priority, nor of anything but merit. If Mr. Jones has a method better than ours, let us use it. On the other hand, do not let us think for a moment of using this or any other new method until we have sifted it well to the bottom and made sure of the fact that it is better than what we now have.

Mr. Naugle: Before the discussion would close I would like to make a motion that we give a vote of thanks to Mr. Jones for the careful, painstaking manner, for the labor and time he has taken to bring before us this able paper.

Mr. Ittner: Second the motion.

Mr. Purington: I want to say, before this motion is put, as to the reason that there is not more discussion on this paper. It seems to me that until the report of the committee is made it is impossible for us to go into the discussion of a paper that very closely relates to it, and while this paper, as Prof. Orton has said, is very admirable and entitled to our thanks, I do not want Mr. Jones to think that because we do not discuss it we feel no interest in it.

D. V. Purington, Chicago.

Mr. Gomer Jones, Geneva, N. Y.: I fully recognize the position Mr. Purington has taken. I do not regard it as any discourtesy. I should think it entirely out of place when you have the able report of Professor Orton still to listen to. Judging this report from the rest of his work, in which I have taken great interest, I am sure it will be quite complete.

Mr. Naugle's motion was then put and carried.

President Richardson: We will proceed to the next after the Secretary has announced it.

Secretary Randall: The next number on the programme is the "Evolution of the Paving Brick," by H. A. Wheeler, St. Louis, Mo.

THE EVOLUTION OF PAVING BRICK IN THE UNITED STATES.

Mr. President and Gentlemen of the Convention:

About 1870 a coal operator of very limited means was passing along the Columbia Bottom road in North St. Louis, when his attention was attracted by some bright red clay that a welldigger had just found in sinking a well through the lower coal measures. The blood red color of the clay made such an impression on him that he had the well sunk deeper under the impression that he might strike a sausage mine, if nothing else of value was developed.

He had just had a painful experience in trying to market the fire clay from under his adjacent coal seam to some zink smelters, with very unfavorable results. but this did not discourage him in making ing new efforts after valuable clays. He was rewarded by finally striking a two-foot seam of a very valuable variety of fire clay, known as glass pot clay, but it was overlaid with from fifteen to twenty-five feet of a lower grade of fire clay, and the location was too distant from the railroad to enable it to be marketed in competition with the Cheltenham fire clay, which was of better quality, and occurs at the doors of the St. Louis fire brick factories.

To find a use for this thick overlaying bed of inferior fire clay was the problem that confronted Mr. George Sattler, the name of this coal operator, as it would be neccssary to strip this to profitably work the one to two feet seam of the underlying high-grade pot clay. Learning of the extensive use of brick for street paving in Holland, where it had been used for over a century in a country that is devoid of natural paving material, he began experiments to utilize and get this inferior top clay out of the way by turning it into paving brick. He started out with a good idea, but lacked the personal means and experience to carry it out. He was successful, however, in obtaining financial aid, first from private and subsequently from public sources, as the average St. Louis street at this time vibrated from mudlanes to dust strcets, according to the weather, so that he finally obtained a purse of $5,000 from 100 public-spirited St. Louisans to carry out his experiments. With this fund was built the first plant for the exclusive manufacture of paving brick in the United States in 1880. While Mr. Sattler was assisted in his work by the other clayworkers of St. Louis, the novelty of the problem and the general lack of technical ability made the experiments costly and very slow in the development of favorable results. While finally a few excellent paving brick were made, the difficulties of securing even a limited percentage of good pavers were so great that the closely watching capitalists became discouraged, and abandoned the problem to Mr. Sattler's undiminished enthusiasm. For Mr. Sattler was blessed with that enthusiasm and tenacity of purpose of the pioneer that never waned or admitted of defeat, even after his credit and friends had become completely exhausted, so that when his health also finally failed, he was up to his untimely death, in October, 1890, as enthusiastic as ever as to the future possibilities of paving brick, though even at that date he was not aware that others had successfully carried it beyond the experimental stage in this country. So as a side issue of the pot clay industry resulted the first paving brick factory in this country, and while this particular plant was torn down in 1892, the pot clay industry is of no greater magnitude than it was in 1870, or less than $500,000 in value annually, while to-day the youthful industry of manufacturing paving brick represents an investment of over $10,000,000, and the zenith of full manhood will undoubtedly show a very much greater development. While a few of Mr. Sattler's occasionally good pioneer brick still survive him on the streets of St. Louis, the germ that he started of making an exclusive business of paving brick has grown into a widespread industry that now numbers over two hundred plants, with a producing capacity of over 800,000,000 brick annually.

In the light of present knowledge and past experience it is now easy to look backward and see why Mr. Sattler, in his dark groping, failed in trying to utilize a clay that was utterly unfit to make an economical paving brick. It is also interesting to note that in trying all kinds of mixtures and materials at his disposal, which included almost all kinds of clays, that one of the finest paving brick shale in this country was condemned in his ignorance as worse than worthless. For he showed the writer a swelled and bloated mass of scoriaceous material that was about three times the size of the original molded brick, and which nearly lifted the top off his kiln, from the characteristic excessive swelling of most shales when improperly burned.

Mr. Sattler made his pavers of block size, to more favorably introduce this new and untried material in competition with stone, or about four by five by nine inches, to reduce the antagonism of the contractors. This very large size greatly increased his manufacturing difficulties, and also tempted him to abuse the blocks by using very poor foundations. This pioneer idea that it is necessary to mold pavers into block size is not yet outgrown, and while commercial reasons may have made it very desirable, if not necessary, when brick were fighting their way into recognition, the writer now thinks that quality and economy call for a halt in making excessive sizes, now that the position of paving brick is well established.

The next effort to introduce paving brick was made at Charleston, W. Va., where a block of brick pavement was laid in 1870. These brick were not specially made for the purpose, but were carefully selected repressed stiff-mud brick from kilns of building brick, and made from a surface or lose clay. These brick were burned very hard for a surface clay, as they absorb only 4.5 per cent. water in twenty-four hours' soaking, and while Charleston is a town of about 12,000 people, they have made an excellent record for themselves, as they are still in use after twenty-eight years' continuous traffic on the principal street. The success of the Charleston brick encouraged a similar experiment to be made in Bloomington, Ill., in 1875, for which the brick were selected from the arches and hard portions of a kiln of building brick made from an inferior glacial clay. These brick absorb 4.3 per cent. water after twenty-four hours' soaking, and although they were a poor quality of paving brick, they withstood twenty years' service before they were worn too thin on one of Bloomington's busiest streets, a town of about 26,000 inhabitants.

Wheeling, W. Va., was the next place to experiment with paving brick, and some hard burned fire clay brick were first laid in 1883. As these gave promise as to their durability more pavements were laid of this same kind of brick in 1885, and the fire brickmakers of this neighborhood saw sufficient encouragement from this early experience that the first efforts to enter into the commercial manuafcture of paving brick, as a distinct industry was started in this district, which has since developed into one of the largest paving brick centers of the country. These early upper Ohio pavers were generally of very good quality, as the fire clay which is employed is sufficiently impure to easily burn to a hard as well as a tough brick, and considerable care was exercised to pick out the underburned or soft brick. The pioneer in thus establishing paving brick on a commercial basis was John Porter, who ultimately had six different plants devoted to this infant industry, all of which under another management are still heavy shippers into the Eastern markets, with a combined capacity of 90,000,000 brick annually. The neighboring towns of Parkersburg, Steubenville, Youngstown and Columbus followed Wheeling's example in trying the new, attractive, cheap, efficient paving brick, and with increasing experience came increased confidence, with a natural broadening among the producers as well as the consumers.

The introduction of shale for paving brick started at Peoria and Galesburg, Ill, in 1894, which State has an abundance of shale, but scarcely any other paving material. The shales gave varied results, but enough good results were obtained as to show that with proper care and discrimination excellent pavers could be made from shale. The use of shale introduced the new element of overburning, ruining the product, which was unknown in the pioneer fire clay plants, as with the latter the harder the burn the greater the percentage of first-class pavers. It was also found that shale required much more care in the speed of watersmoking and burning, and many a pile of bloated brick testified to the costly price at which this experience was learned, while the margin was found to usually be quite narrow between the brittle, glassy, overburned or sewer brick and soft underburned or building brick.

The experience of the Illinois brick yards with shale stimulated efforts in Nebraska, Kansas, Missouri, Iowa, Indiana and Ohio to utilize their local shales, which are abundant in these States, and many local trials were made of these shale pavers by the smaller cities and towns, with very varied results. The costly experience had again to be learned that while shale is shale, it is like all other kinds of clay, in that no two are exactly alike, and each has its individual peculiarities that effect the manufacture and the quality of the product. Also that shale adopted for economically producing a high-grade paver is by no means abundant, though shale banks are very numerous in the above States.

The early shale experiments were also made on yards that were mainly equipped with up-draft kilns, and the temptation to sort too favorably into the higher-priced pavers resulted in too many underburned brick being shipped in trying to get a reasonable percentage of paving grade from the central portion of the kiln. While down-draft kilns greatly increased the cost of equipping the yard, it was soon found necessary to adopt this style of kiln for successfully making paving brick if the quality of brick and the cost are considered, which was considerably accelerated by the appearance of the field of a very aggressive, optimistic patentee of a very good kiln.

The increasing number of favorable experiments of paving brick on the street early attracted the attention of the progressive clay machinery manufacturers to the opening up of this new field, and the application of their brains and experience led to many improvements in the quality and diminishing the cost of the brick, not the least of which was the early introduction of well laid out artificial tunnel dryers, which resulted in marked improvement in regularity and amount of the output, with consequent lessening of cost.

As paving brick began to win their way and open up an attractive market, the attention of brainy manufacturers was drawn to the growing industry, so that we find such industrial captains identified with it, after it had attained a commercial position, as Purington, Townsend, Robinson, Spruck, Culver, Rogers and McAvoy, until in 1894 there was one plant in Galesburg, Ill., that had an annual producing capacity of sixty million brick, with a capital of $500,000, a pretty lusty child for such a young industry.

The users of paving brick were at first confined to the smaller places, which were only too glad to avail themselves of an excellent paving material that came within their moderate means, and as soon as enough experience had been gained to verify the durability of good paving bricks, its use rapidly spread through this class of consumers. But in the larger cities, where much of the property can afford the best of pavements, the characteristic conservatism of large cities, the opposition of established contractors of other paving material, and the complications and vicissitudes arising from hungry political factors, made the advent of paving brick slow and difficult, so that it has only secured a safe foothold in the large cities within the past five years. But the accumulation of experience, the improvement of quality, and the better understanding of the manufacture and testing of paving brick by engineers has finally resulted in paving brick securing an accredited, assured position in its proper place in every city in the United States that it can reach on reasonable terms. While the early enthusiasts would have had every other kind of paving material give way to brick, its eminent merit needs no such sweeping statement, as no paving material has yet been found that possesses all the qualifications of an ideal paving material to a maximum degree. But the very easy traction, freedom from dust, low cost, slight repairs, durability, eminent sanitary character, ease of tearing up, suitability for steep grades and much less noise than stone, assures paving brick of a very large field in the largest as well as the smallest cities in combining more merit for less money than any other paving material.

And now that prosperity is again returning, when public improvements can again be unbegrudgingly undertaken, a new era is about to open that will necessitate the erection of many more plants to meet the heavy general demand that is almost assured. For to-day all the large city markets, with their heavy demands, are open to the aggressive brickmaker, which less than ten years ago would not permit brick to be used, and with the demand for new streets, due to the normal growth of the American cities, the slow replacement of an enormous mileage of macadam (with its dust in dry weather and mud in wet), the crowding out of the noisy, rough cobble stone, the decaying wood and other inferior paving material by brick assures an enormous future market in urban and suburban markets. As the country slowly increases in wealth, the more prosperous counties are going to increase their prosperity by paving their main arteries with brick, which at present is one of the few paving materials which comes within the means of most county pikes in relieving them from the stoppage of business that results during our wet winters.

In the evolution of paving brick, which has greatly improved in quality and uniformity since its introduction, the quality was somewhat interfered with through the mistaken idea of many engineers that the less the absorption the better the brick, and in consequence many overburned brick were produced to meet the requirements of faulty specifications.

This Association can claim no little credit for making the pioneer effort to arrive at a standard, reliable, satisfactory method for testing paving brick through a committee it appointed in 1895, and in the large amount of original work that was necessary to arrive at this standard system the name of Prof. Orton, jr., cannot be overlooked for the thorough manner with which he obtained much of the data for the committee's consideration. It is also satisfactory to note that the work of this committee has been highly appreciated by the engineers, and has accomplished much in clearing up many hazy points, and putting paving brick on a much higher plane since it has been shown that easy, reliable, inexpensive tests can eliminate all uncertainties, and safely bring out the merits of paving brick.

Thirty years have not quite elapsed since the maiden effort was attempted in 1870 to utilize the Dutch idea of paving our streets with hard burned brick, and half of this time was spent in waiting and watching for the expected failure of the experiment. For the public has always been opposed to brick for street pavements from the quite general knowledge of the short life of building brick for sidewalks, stables, etc., and it has required very vigorous and persistent efforts on the part of the paving brick pioneers to educate the public to the fact that paving brick is an entirely different material from sidewalk brick. So that the commercial life of paving brick may be said to date from 1885, and it was 1890 before there were any considerable number of plants devoted to this specialty. But when the people at large finally had ample apportunities to see for themselves, by actual use, that vitrified brick is one of the best of paving materials, and that its merits are very numerous while its scope is very great on account of its low cost, it has come rapidly to the front, and has finally attained an almost universal, very enviable popularity, and a very extended adoption. From an uncertain, variable, distrusted article it has developed into a uniform, reliable, safe, high-grade paving material that can be safely determined by simple standard tests, and in consequence it is now in use in nearly 400 cities and towns in the United States (Applause.)

PAVING BRICK—GENERAL DISCUSSION.

President Richardson: This paper is now open to discussion.

Mr. Purington: I would like to remove one little error or doubt in the mind of Professor Wheeler in regard to the discovery of shale. I will guarantee there is not a man in the business in Galesburg but will undertake to prove that shale was first discovered by him for paving brick. I never before heard that Peoria ever made any claim of having discovered shale. A man by the name of Stafford—and the material is sometimes called Staffordite—discovered that by mixing up shale and grinding it with water, and then burning it in the kiln, he could make material superior to anything ever heard of before. This is the first time I ever heard the discovery of shale questioned as originating anywhere else than Galesburg.

Mr. Eudaly: I will say that in 1884 a man by the name of Calkins, who lived in Chicago, interested himself in a tile factory at Galesburg. They had some kind of an old stiff clay machine and an old-style tile mill, and two round down-draft old-style kilns. I myself was invited to go down there and look at Calkins's shale clay. He had invented a paint mill for the purpose of manufacturing paint out of the iron nodules from his shale. I think that at this time, though I will not be right certain, this Mr. Stafford referred to was in Mr. Calkins's employ. Of course, you know what I was there for, and it is not necessary for me to say that, and I spent almost two weeks tinkering with this supposed-to-be paint and this clay. Mr. Calkins was a man that had an idea that everything almost on earth could be made out of clay. He was one of the greatest experimentists, in a sort of a tinkering way, I have ever met. I went with him to Peoria to look at that piece of street or block that was laid with paving brick, and I saw the brickyard where those brick were made. They were burned in the old style up-draft kiln, and made the old style way of making paving brick. I saw some of those brick in the kiln, saw them in the benches when they were taking them out, then I saw them in the street. There was no talk in Peoria or anywhere else of paving brick. We went back to Galesburg, and there was another man there by the name of Calkins, though no relation to the first. He was President of the Council, and they had a little clubroom where they met night after night, and there they conceived the idea of making paving block eight inches square and about the thickness of an ordinary brick and putting it around the courthouse square. They put them on the streets leading into this square, and the next spring I went back there and they had decided to pave a whole block with brick that they had made out of this shale, and I have no doubt that these were the first paving brick ever made from shale and ever used in this country, and this, I am quite sure, was in 1884.

Mr. Plumridge: One thing in the evolution of paving brick that Mr. Purington has probably forgotten, and that is the paving of the intersection of Dearborn and Washington streets, in Chicago, with six-inch-square blocks made at Haydenville, this State, and the bottoms were hollow and filled with sand and turned upside down. They were made of fire clay, at the same time these other brick spoken of. In reference to these shale brick: I lived in St. Louis and worked in Chicago. Mr. Calkins had an office in the old Chamber of Commerce Building, and before I went to Chicago Mr. Saddler had put down that paving brick in St. Louis, on Third street, and all the heaviest hauling was on Third street and gave these brick the severest test. Of course, these were not shale brick, but, at the same time, Professor Wheeler is right when he says the paving brick industry first started from that point.

Mr. Gates: Mr. Calkins has very often made the claim that he made the first paving brick and put them down.

Mr. J. G. Shea: In 1884 I made brick on a machine, burned them in down-draft kilns, and in 1885 we laid our brick in the streets of Decatur, and they are there yet. They are made of surface clay.

Professor Wheeler: I think I am right when I say the paving brick industry was started in the two places about the same time—St. Louis and Galesburg. Where Mr. Calkins worked shale was introduced for that purpose. We have a member here to-day who was one of that committee of one hundred citizens of St. Louis who subscribed that purse of $5,000, to which I have referred, to enable Mr. Saddler to continue his experiments. I know you will all be glad to hear from Mr. Ittner.

Mr. Ittner: It seems to me a matter of history or the question of dates in the history of paving brick manufactured in this country. Professor Wheeler has presented a brick made by Mr. Geo. Saddler. I have had some experience, as he has already stated, with reference to the brick made by that gentleman, but (picking up one of the brick on the table) that is not the shape of the brick he made. As near as I am able to describe his brick, it was about nine inches long, three inches thick and about the usual depth of a street paver. Whenever I speak of dates and the years passing, in this Convention, I speak with a little lameness—something like Brother Purington speaks about burning brick and drying brick. I remember two different times when Mr. Saddler made and burned a kiln of paving brick, and it was not in Eudaly's kiln, either. I think that Eudaly was practicing law in Cincinnati at that time, and that his kiln was not then patented. These brick were burned in a small down-draft open kiln, and the kilns were made to hold 5,000 brick. At the time the first kiln of brick was made I was not a subscriber to the fund referred to. I was working for Mr. Wm. Glasgow, an old citizen of St. Louis. The first kiln did not turn out as well as they had wished, but there were some very excellent brick in that kiln, and I was one of a committee of six appointed by the Mayor to take up the brick at the intersection of Third and Pine streets, that had laid there three years and two months, in the heaviest traffic street in the city of St. Louis, and when we took them up we made a report that can yet be seen in the City Register. I am not confident, but think it was before 1884. As that kiln did not prove just right, Mr. Saddler wanted another trial, and he got another and second fifty citizens to give $100 toward making the second kiln, and the people interested were not content to have Mr. Saddler conduct the test. He was not a brickmaker, but was an enthusiastic believer in the virtue of this clay for making paving brick. They got a man of great experience out in St. Louis—I do not recall his name—to come and make the second test, and it was not so satisfactory as the first, and this in the face of the fact that this man was regarded as one of the most experienced men in the business in the country. If Mr. Saddler himself had made the second test, perhaps there would have been a

H. A. Wheeler, St. Louis.

third test, but as he did not, but an experienced man made it and it proved a greater failure than the first, it put a quietus on it. I neglected to state that the report of that committee appointed to take up the brick referred to showed the wear was one-eighth of an inch. There are samples of these brick to be seen in the city of St. Louis to-day, and some of the brick may still be down in the streets. I do not care to continue this discussion any further, but if ever a man deserved credit and praise for sticking to an enterprise, I think Mr. George Saddler is that man. He was one of the most enthusiastic men on the subject of brick paving that ever lived, and it was this very enthusiasm that injured him, for people took him to be a crank. George Saddler died of a broken heart soon after the failure of his experiment. He lost a son he loved dearly. That was the first blow, and a short time after he lost his wife, and a few months later he died, and I know he died of a broken heart.

Mr. Naugle: I understood from Mr. Wheeler that the Charlestown brick was a slop brick. I have just read on this label on the brick, "Oldest United States paving brick. Hard burned common brick, after twenty-two years' service in the streets of Charlestown, W. Va.," and this is dated 1885. This I notice on examination is a wire cut brick.

Mr. Eggers: I think it was made in a mold and struck off by a wire.

Mr. Townsend: I think I can throw some light on the Townsend brick. I built the courthouse there and took up the street where that brick was laid. The brick were laid on boards that had been covered with tar and laid on the ground, then sand was put on and then the top course of brick. These brick have laid there since 1870. They were nothing but hand-made brick, made out of ordinary common clay. I can also give you some information in regard to the Peoria block. I took up two miles of those Peoria block and some of them were good and some had gone to pieces. They are large block, about eighteen inches long and five inches square, and look like granite in size. That street in Peoria had been down ten or twelve years. I think the brick that is being shown us is a Charlestown brick, that was put down in 1870.

Mr. Eudaly: I want to say a word about these Charlestown brick. I went to Charlestown at the same time we were investigating the Galesburg brick, and I found on the yard where these brick were being made a Sword machine, and I believe a Sword machine made these brick, but I am not certain.

Mr. Harris: There has been a great deal of history covered in this discussion. I want to give the paving brick men a bit of information that has come to me. I received at noon a letter from a friend of mine in the East, who is more or less familiar with government work and requirements of government contracts, and he says there is on the architect's board for the goverment the building of three dry docks. It is contemplated to build one of stone or concrete and two of wood. Government engineers have condemned wood, as it rots, and stone or concrete must be used. My friend wants to know why the government does not use vitrified paving brick. This, I think, if properly put before the proper parties, would have considerable influence, because of their unquestionable durability and strength and economy for the purpose. For the gentlemen interested in paving brick here is a suggestion, and no commission.

Mr. Eudaly: The government is not going to stop at three dry docks and these docks, if built of other material, will have to be rebuilt, so have your paving brick ready. (Laughter.)

President Richardson: Before we go on with the programme there are some announcements to be made. This evening there will be an informal reception in the hotel parlors for both the ladies and gentlemen. The Executive Committee will meet in Mr. Purington's room, Parlor H., at 8 p. m.

Mr. Gates: I have an announcement to make. The new Ceramic Association have been making arrangements for the publication in English of Professor Seger's works, something for which we have all waited for many years. It will be very expensive, and it is necessary to get a certain number of subscribers, and know what we can expect. Quite a number have been obtained. It was thought if I would make the announcement in our meeting, any members who desire to subscribe for the work can leave their cards with me or with Secretary Randall. We think this book can be obtained for $10. We think this is the least we can consider. There are two large volumes of it. If we do not get a certain number of subscribers it cannot be obtained for that amount. In the meeting of the Ceramic Association this morning the matter of the appropriation for the Department of Mines and Mining was taken up, the same as it was here, and the same action was taken, and the Association authorized me to say that they will labor with their Representatives in Congress to have that appropriation passed through, in order that we may obtain these statistics in clay matter to which we are certainly entitled. If the members of this Association will do a little work with our members in Congress we will get the statistics we want.

Secretary Randall: The next in order is the report of the Committee on Technical Investigation, by Prof. Edward Orton, Jr.

Professor Orton presented an exhaustive report of the experiments made under his direction by the Association's appointee at the University the past year, stating in advance that the report was not yet completed and ready for publication, but would be finished in time to be included in the report of the Convention to be published in book form later on. The report was listened to with deep interest and at its conclusion, Prof. Orton was loudly applauded.

—Large Versus Small Paving Brick—General Discussion.—

President Richardson: This, of course, like all the papers, is ready for discussion.

Mr. Eggers: This demonstrates that the engineer in the city of Cleveland has been correct in his views as to size of paving brick. He has maintained for the last eight years that the larger the brick the better results you get, and this report has demonstrated that the block they are laying in Cleveland, and which is wearing so well that it has almost cleaned up the asphalt people and also macadam stone, gives better results in the rattler tests and better results in the streets. We have streets where the pavements have been laid twelve or thirteen years, and they took up portions of them last summer to build a sewer, and I observed that some of the small brick were worn down a little. They were fire-clay brick. The position that the engineer of the city of Cleveland has taken is that they don't go any more on the absorption test, but they want a large brick, and it confirms what Professor Orton has proved. I would like to make this statement that he is right (laughter), because it has been demonstrated in Cleveland, and, when Cleveland demonstrates anything, it is right. (Laughter.)

Mr. Plumridge: I would like to ask Professor Orton whether the clay in the brick he made the etsts from was thoroughly weathered, or clay that had been freshly mined.

Professor Orton: In the nature of the case it could not have been very freshly mined, because it came to me, most of it, in the fall of the year. I received the clay in a dust condition, as it had gone through the screens in the plant that furnished it, and stood around in barrels, and, when we got ready to make up a batch, we would break open a barrel and take out what we wanted. Of course, the clay was air tempered.

Mr. Purington: If the engineer of the city of Cleveland is to map out the work for the paving-brick manufacturers, and if the engineer of the next city follows along in the same line, the next thing will be that the clay will have to be put down on the street in a plastic state, and, by some heretofore undiscovered process, burned right there. That is what we will come to. I want to say as a practical man that no man can compete successfully with the man who makes a seven-pound brick by making a brick over fourteen pounds, as they have been using in the city of Cleveland. It is impossible to get a large per centage of good brick with any shales I am familiar with and have them thoroughly burned. You may do it with fire clay. It is an absolute impossibility to make brick the size the city engineer of Cleveland wants them, and do it profitably.

President Richardson: I have had some experience in the way of making these blocks in Cleveland. They make a good paving brick, but it was a failure financially until the city of Cleveland used a large number of sewer brick, and created a demand for these small brick which the manufacturers can burn all around these big brick.

Mr. Eudaly: I am more than delighted with the report of Professor Orton, especially the last part of it, and I think it only fair to Professor Orton to state that, so far as I heard, he did not attempt to discriminate between large and small brick or make any report in favor of large or small brick.

Mr. Purington: He did make the report, if I understood him correctly, that the large brick would stand better in the abrasion test than the small brick.

Mr. Eudaly: Not at all.

Mr. Howard: I would like to inquire of Professor Orton if he has full information of the treatment of the clay from the time it is mined until the time it is used.

Professor Orton: I do not know anything about what treatment the clays received before they came into my hands, with the exception of three cases out of the ten. In one of these cases I received the lump clay, ground it and screened it myself. This clay was from Syracuse, N. Y. Another clay I got from a Columbus factory. I went up and examined their clay pile, which lay just in front of the dry pan, where it was placed just before shutting down for the winter. We got that clay from the pile, and ground and screened it ourselves. We went out on the college campus and got the other sample. I do not see, however, the bearing of the question on that point, because I do not believe that the treatment this clay has or has not had before it came ito my hand could make very much difference. It seems to me to be immaterial whether the clay had been mined one or two years or newly dug from the earth. Each clay had a fair chance to develop its best qualities, and, whether it was a good clay or a bad clay, the bricks made from it ought to show up the differences resulting only from the manufacturing processes. Answering Mr. Purington's question, I would say that I stated that the bricks developed strength in the rattler in proportion to their relative thickness, but I did not state anything about their size. I expressly stipulated that I was unable to prove the effect of size, which was the point I originally undertook to settle.

Mr. Purington: Did your investigation show you anything that would convince you that the larger the brick the better its wearing qualities?

Professor Orton: I would say this: I have a kind of an internal feeling that a large paving brick well burned, and everything else being equal, is better than a small one. But I did not prove this in my report, nor in any of the investigations we have made. But, in my general laboratory work, I have brick sent in from various places at various times, and from the tests made of these I have formed the general opinion that the large brick do stand the best tests; but that is one of the things which I want to settle, but have not yet been able to do.

G. S. Ettla, Clearfield: I have listened with a great deal of pleasure to the report Professor Orton has given us. He calls attention to the proper proportion of the size of paving brick. I only want to add one statement, and that is that the proper proportionate mixture of fire clay and shale gives a better paving brick than either fire clay or shale alone.

Mr. D. V. Purington: I want to say right here that I am prepared to disprove that statement any time and anywhere.

Mr. H. A. Wheeler: Professor Orton has given us a most meaty paper, and I move, Mr. President, that this matter be taken up the first thing in the morning.

Motion seconded by Mr. Bloomfield and carried.

Mr. Sibley: I move we adjourn.

Seconded by J. C. Adams and carried.

FOURTH SESSION.

Thursday Morning, February 9, 1899.

President Richardson: The Convention will come to order.

Mr. Gates: I have a resolution I wish to introduce. I have drawn a hasty copy of it. In fact, I had drawn one last year; a little later on I drew another, and still later on, in traveling, I run onto a circus manager and he drew one, but the one he drew, which is the best, I have, through a mistake, left at home.

Resolved, That a committee be appointed by this Association to be known as the Committee on Trade Relations. That this committee shall obtain statistics and data for furthering the use of burned clay in building structures, and cause such data to be printed as extensively as possible, and that in all this the chairman shall be assisted by the individual members, all working heartily for the more extensive use, not only of fire-proof business structures, but of fire-proof houses as well.

That this committee be empowered to represent this Association in all matters of public buildings, and shall work with the supervising architects, as well as others in public authority, for the more extensive use of our wares in public buildings.

That this committee extend our thanks and hearty co-operation to our trade and architectural journals that are working to this end.

That this committee shall also labor for the further extension of the popular movement for good roads representing this Association.

That this committee shall also represent this Association in the matter of the inauguration of a Cabinet Department of "manufacture and trade" by our Government.

That this committee shall investigate as to probable public buildings, and shall call to their aid any member of this Association whose aid shall be required, and that all such members shall use their best efforts to assist by all means in their power.

That Mr. F. C. Manson, of Boston, shall be chairman of that committee, and that all the members of this Association shall be members of that committee, subject to duty at the call of the chairman.

Mr. Gates: My idea was that the chairman of this committee, by keeping in close touch with the business as it progresses, keeping watch on all bills introduced for public buildings, and, early in the life of these bills, ascertain where the building is to be and what it is to be, probable cost, etc., and then call on the members of this Association who are from that particular locality to fight for the use of our material in that building. The chairman of this committee, if he is to attain any success, must have every member ready and willing to respond to his call. A series of letters from the constituents at home to the members of Congress will have some influnece with them and those who control these things. We must keep close in touch, and know early what is going on, in order to attain success. The chairman of this committee must be on duty a great many days of the year, and some nights, but he must be assisted by every member of this Association.

President Richardson: This resolution will go to the Committee on Resolutions, and we will take up the programme where we left off last evening—the discussion of the report of the Committee on Technical Investigation. I will call on Mr. Wheeler to lead this discussion.

—Size of Paving Brick—General Discussion.—

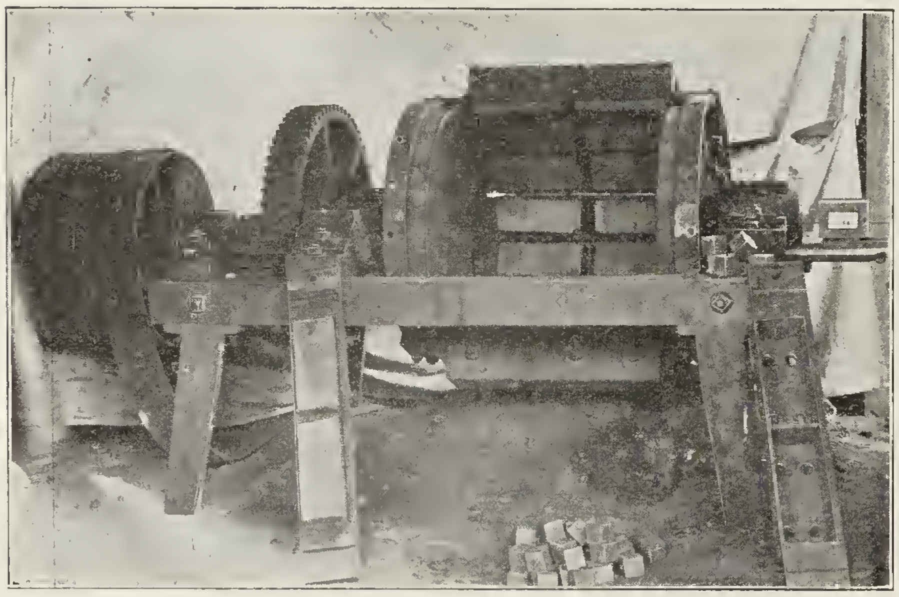
Mr. H. A. Wheeler: Mr. Chairman and Fellow-Members—I would like to place on the blackboard these figures:

	Per cent Loss in Rattler.		Ratio of Thickness.	Corrected Loss.
1.	31.5	brick.	.068	33.3 per cent.
2.	27.9		.074	32.9 " "
3.	25.6		.081	31.2 " "
4.	33.2	block.	.089	29.2 " "
5.	31.7		.093	27.9 " "
6.	29.1		.103	25.3 " "

These three columns or set of figures are extremely important to every manufacturer and user of paving brick, and they are still more important to this Association as a body. They very keenly and very sharply tell us that we have only got to the middle of the bridge, and we have burned that part of the bridge over which we have crossed. We have got to reach ahead and finish this investigation that Professor Orton has started. We must very keenly appreciate the relation of width and depth of the brick, and here he shows that if you have the proper proportion you very materially improve the quality of your brick. It will necessitate his doing a very large amount of work on this new basis, and, until that is done, we will not know whether the best form of paving matrial is a block or a brick. These figures are valuable as far as they go, but they only carry us to this point, and, as this Association has made a name and reputation as a result of this investigation—call it scientific work, if you wish, or financial work—but it has made this Association known among people and individuals where it was utterly unknown, among a class of people who are not in sympathy with the work, and this reputation is invaluable, and I think we can well offord to carry it to a successful finish. The paper of Mr. Jones is certainly open to question as to whether the method by which we carry on our rattler tests is better than that of Mr. Jones. For we can so conduct our rattler tests as to get a strong impact action or a strong abrasion action, and what we now want to know is whether the small brick will show a greater loss proportionately than when they are large. We want to know this from facts, and not as guess work. As an Association we owe it to ourselves, we owe it to the reputation we have started and established in such an admirable manner, to see that Professor Orton is given financial assistance to carry this to a conclusion. At the same time I do not think we ought to hold in abeyance such valuable contributions as that Mr. Jones has given us.

W. D. Gates, Chicago.

I am glad to say that that old pioneer, who, I think in time, while he may not be worshiped, will be placed on the pedestal he deserves by paving brick manufacturers—Mr. Geo. Sattler—suggested the following as the proper test for paving brick, but it only furnishes abrasion action. He made a walk or small roadway, wherein paving brick, common brick, asphalt, macadam and other paving material was laid, over which he ran a wheel fastened to the water-works engine, to show the effect of wear upon the brick. Eighteen years ago Prof. Ira Baker, of Illinois, was the first man to call attention to the proper investigation of the abrasion test to show the effect of the horses' calks on the pavement, and it has been discussed by engineers all over the country from various standards, and the rattler has proved to be the most practical and successful method of arriving at the value of paving brick, as it combines abrasion and impact action. If you run the rattler at a low speed it gives solely abrasion action; if you run it at a high speed the action is mainly impact; at intermediate speeds, both abrasion and impact action is attained. A paving brick should combine both toughness and hardness, and hardness will make a very successful test against abrasion test, and toughness against the impact test. In Mr. Jones's rattler he introduces what he thinks more nearly gives us the actual conditions under which the brick are used in the street. He lines his rattler or iron barrel with the paving brick to be tested, by making his staves hollow, and securing the brick in these hollows. He puts into this barrel 150 pounds of cast-iron cubes. I believe this rattler was twenty-four inches in diameter, which is about one-fourth less than the standard rattler, and run at twenty-five revolutions a minute. In the standard rattler the impact action will, therefore, be much more severe than in the Jones rattler. Mr. Jones assures me that in making his rattler test the cubes are carried up over half the diameter of the rattler, which must give a decided impact action, as well as giving a decided abrasion action from the rolling of the cubes. This is Mr. Jones's contribution in his efforts to develop the same condition in the rattler under which the brick are used in the streets. For the fall of the cubes of iron of a little less than one pound in weight, with sharp corners, is an attempt to duplicate the effect of the horses' hoofs, as the calks of a freshly-shod horse we know to be very sharp. Now, the blow from the calks of an 1,800-pound draft horse is very heavy, whereas that from a light driving horse is light and swift. While Mr. Jones's method produces impact, it is the impact of a light piece of iron with sharp corners or angles, and I think you will recognize there is a great difference between the iron cubes falling about twelve inches and the blow of a horse's hoof. But I think it is quite unnecessary to attempt to duplicate the conditions of the brick in the street, as the information desired is which is the toughest brick.



Mr. Jones's Rattler, Cubes, etc. See pages 130 and 131.

One valuable thing about Mr. Jones's paper is that it permits a direct comparison between brick and block sizes.

Mr. Jones kindly favored me with the loan of his paper last evening, and it is such a radical departure in conducting the rattler test that, with all due respect to Mr. Jones, I think we ought to be a little reluctant about giving a decided expression of our ideas, one way or the other. For, if you will remember, the report of the Paving-brick Commission was the result of about one and a half year of work by several different parties in several different places. The gentlemen who finally met and digested that data were composed of some of our best brickmakers, clay experts and engineers. The report gained the respect of engineers from the engineers on that board, for Prof. J. B. Johnson stands at the head of engineers on the subject of testing material, as he has the largest and one of the best testing laboratories in this country, and his books are recognized as a standard. Mr. M. L. Holman, of St. Louis, has a national reputation as an engineer, and stands very high in the profession. These two engineers alone would give weight to any paper that had their signatures amongst the engineers of the country. As to Professor Orton it is needless to mention the value of his services on such work before this Association. Mr. Harrington was another engineer who worked entirely independent of Professor Orton. There were two other engineers on the committee who were then making paving brick, besides three of our leading paving-brick manufacturers. The Commission spent about two years on this work before they began to prepare their report. Then we spent three days discussing it, as I was invited to take part with the members of that committee. I wish to say right here why I joined this Association, though not a brickmaker. It was because I saw you were doing such valuable work that I could not afford to not be a member of this Association. (Applause.) This special joint committee did its work with such care and deliberation as to entitle them to the profound respect of the brickmakers, the brick users and independent parties. So, unless we have something decidedly better, I do not think we ought to be hasty in throwing over their results at the first opportunity for something which seems a little better. We should have good reasons for adopting something new, and this method of Mr. Jones is such a radical departure that we should be cautious.

I think the proper thing for this Association to do is to thoroughly consider this method of Mr. Jones, as I think no one would be more glad than this committee if we can find a better method of testing paving material than we now have.

There are a few features in the Jones method that impressed me in my brief examination of it. First and foremost, it exposes only about one-fourth to one-fifth of the brick to the wearing action of the charge. While it is true that this is all that is exposed in the street, you will appreciate that we want a method of testing that will clearly and quickly tell us which brick are the best. Now, in comparing Mr. Jones's method to the standard method, there is a loss of only 2 to 7 per cent. in the first case, and from 10 to 40 per cent. in the latter. Now, anybody can appreciate the difference between losses that range from 10 to 40 per cent., but, when your best brick loses about 2 per cent., and your worst brick about 7 per cent., there is a delicacy required in discriminating in the Jones method that is very unattractive. This is a very important feature. You have got to carry the test into the tenths, and of one per cent. into hundredths, and such excessive refinement is very unde·

A second feature is that in putting these brick into the pockets, unless the brick are all the same depth—that is, unless they are all on a level—the wear is not uniform. Of course you can bring the wearing surfaces to the same height, but to do it you must have a level, and all that means time, and gives ample room for producing results not satisfactory. If you do it right it is all right, but it is going to take a great deal of time and trouble to do it right.

Another objection I see to Mr. Jones's method is that he has to depend on blocks of cast iron to produce the abrasion and impact. Now, as a first-class paver is harder than ordinary cast iron, you can see iron will be very short-lived, as the sharp corners are going to very rapidly wear off, and a set of tests with rounded cubes will not show anything like the severe action as a fresh set of cubes with sharp angles. Mr. Jones tells me that after about 10,000 revolutions, or three tests, that these corners are worn out. Some engineers have to make a dozen tests a day, so they would almost have to have a foundry annex to their laboratory. The brick people and other clay people know that no two clays are alike, as clays are like men, or, perhaps, that is the reason no two men are alike, because we are made of clay. With iron there is the same trouble, as no two batches of iron are alike. There are few iron foundries in the country to-day that know the kind of iron they are using, as chemistry is just beginning to appear in the foundry. Again, iron is like clay, in that chemists can assist you, but you have got to look at the physical structure as well as the chemical composition. The differences in iron are so very great that, after you have hired a chemist to analyze the cubes of iron, you have got to send them to a physical laboratory to ascertain the grain of the iron, as some irons have a soft, open, easily-abraded structure, and some a very close, hard structure that takes a high polish. The committee looked very carefully into this, and started at the beginning to use scrap iron in the rattler test. Then we tried to improve on it by using granite as the material to produce the battering action, but we finally found the safest plan was to leave them out, if you want results freest from error. In the Jones method we are going back to the beginning, which gave results which were so unsatisfactory. Another objection to using this rattler of Mr. Jones's is that you have got to have it made specially for you. You cannot go to a foundry and use their rattler. While testing laboratories can well afford to make this special rattler, there are many small cities and towns that cannot, and, in fact, there are very few physical laboratories to-day that have a rattler, as most of them depend on the foundry rattlers. In summing up, the amount of data presented is too limited. The Jones rattler is not so desirable in cost, convenience and economy as the standard rattler. It demands excessive refinements, and yet offers nothing better, if as good, as we already have. So why should we forsake the thoroughly and carefully tried standard method? I am very sorry that Professor Orton could not have completed his tests, as it would have put us in a far more satisfactory position to discuss them. I therefore think it is premature to discuss Mr. Jones's new method until Professor Orton has completed his tests and presents his data before us.

President Richardson: Mr. Wheeler has been opening this discussion, but I desire to say that the time limit will be enforced from this on.

Mr. W. A. Eudaly: I always take this as a good joke, but it is impossible to hurt my feelings, and, when you want to establish a new rule, some how it always strikes me first. Now, Mr. President, you can begin my time. (Laughter and cries of "No.") In the first place, I do not think Mr. Wheeler will be properly understood in his statement with reference to this investigation being premature. I do not believe any investigation or discussion is premature. I believe conclusions may be premature, but we must discuss and investigate, in order to come to proper conclusions. I want to say, in the second place, I was very much pleased with Mr. Jones's paper, and also with Professor Orton's splendid report. Very many valu able things are given in both of these productions. I want to say further that I do not believe it possible for any one to invent a testing machine or process that will come anywhere near meeting the conditions that paving brick meet in the street. In other words, I do not believe it is possible to make any kind of a machine that will represent the actual wear that vehicles and horses put on the streets. I think it is an impossible thing. I do not believe it can be done. I do not think you can carry the water and frost and heat and cold, and hoofs of horses, and vehicles all in the machines described in the papers. You have only to think for a moment to know that the comparative area of one of these cubes in comparison with its weight will not represent the weight of a horse's hoof, in comparison to the amount of the hoof or shoe surface that strikes the pavement. It is impossible to meet these conditions, and, having said this, I want to make another statement. In my own judgment I have come to the conclusion that the proper kind of test or machine, or whatever it may be, to determine the question of the value of street paving brick, should be such as would show the relative value as to structural strength and abrasion of brick. I do not believe we will ever accomplish very much trying to get the same conditions as the brick meet in the street by the contact of the horses' hoofs, etc., and all that sort of thing. What we want to know is whether this brick, made in this particular way, out of this particular clay, is better than any other brick made out of the same clay in a different way. And whether certain kinds of clay, put through a certain kind of process, will make a better brick than a certain other kind of clay put through the same process. We certainly have made a great advancement, but I do hope we will continue to investigate, and never rest with the belief that we have gotten to the end.

A. O. Jones, Zanesville, O.: I believe in theory, but I want lots of practice to prove it, and want to know how to get at this testing. We have been long enough watching the operation in the street. Now, if we will look in the spring or early in the summer, we will see between the joints of the brick little chips or small particles of the brick. These are the edges of the brick, for the top of the brick scarcely shows any wear. It shows that the horses' calks strike the edge of the brick. During three or four of the winter months is when our brick suffer. While I advocate and think a great deal of the standard test of Professor Orton, yet I am a little in favor of the Geneva test, but the little cubes should be made of steel, and come down and hit the edges of the brick. I believe if we had horseless carriages our streets would live forever and a day. But, until we do, we have got to look out for the sharp calks of the horses' feet.

Mr. Bloomfield: Just what that gentleman says proves that Professor Orton's test is the best. The rattler test wears off the edges. The rattler gives the same wear on the top and edges, and, when the brick come out of the rattler test, each brick shows a greater or less abrasion.

Mr. Gates: Just one word here. You will notice in the test of Mr. Jones it is stated that the thin brick and the thick brick would be under the same conditions. I do not believe it. I think there is considerable difference, and that the thin brick will get the harder wear.

Secretary Randall: I am requested to hand this photograph around among the gentlemen. It shows the cubes referred to in the paper. There is another point I wish to mention. You know yesterday we received an invitation to go to the Builders' and Traders' Exchange. They are anxious to have us come and partake of a little of their hospitality, and are now waiting an answer to their invitation.

Mr. Ittner: I want to express my gratitude and the gratitude of every member of the Association for the handsome manner we have been treated by the Builders' Exchange. While I would like very much if we could pay our compliments to the Exchange and be received by them, yet we have scarcely begun to-day's programme, and I think it would be almost impossible for us to spare the time, and also on account of the extremely cold weather. I am told it is fifteen degrees below zero. So I move that we accept the invitation of the Builders' and Traders' Exchange, with thanks, in the spirit in which it is given, but, on account of pressing business and the extremely cold weather, we feel under the necessity of declining the invitation.

Motion seconded by Mr. Eggers and carried.

—The Rattler Test Proposed by Mr. Jones.

Mr. Gomer Jones: There seems to have crept in a misapprehension in regard to this rattler test. It is not intended to supplant the valuable information or the manner of getting valuable information, as outlined by Prof. Orton, because it cannot do that. It is intended simply to get at the results considered necessary from an engineer's standpoint. If any brick does not stand the requisite wear the reason should be found. Prof. Orton's investigation will undoubtedly supply it, and that is what the National Brick Manufacturers' Association is interested in directly. I was simply interested to find out what brick would pay us the best in the street. The objection has been advanced that the losses are not sufficient to define a gradation of toughness between the various materials. That, as a matter of fact can be remedied—increase the size of the cubes or increase the velocity of revolutions of the rattler; either can be readily done. I found that an increase in size of the cubes produced excessive wear, obliterating the most valuable point of my test, namely, showing the small defects which occur in the surface of the brick. Heavy cubes simply destroy the form of the brick, and grind it away, so if there are laminations they will not show. There are evidences of lamination in perfectly appearing brick brought out by the small cubes, but destroyed by the large ones. Therefore, there is good and sufficient reason why I should not make my losses heavy. As to the sharp corners of the cubes wearing off, the cubes are somewhat abraded after ten thousand revolutions, but their efficiency is not destroyed. This has been shown by tests of over four thousand brick. Last year we got regular results by taking out after about six thousand revolutions 10 per cent. of the cubes and adding 10 per cent. sharp ones. The cost is not excessive. But if it were excessive, suppose it actually required a set of new cubes for every new set of investigations, and suppose that the city is proposing to expend $100,000, a small sum for paving brick, and suppose the question of the selection of material comes up before it, what

W. A. Eudaly, Cincinnati.

is the amount of the cost of a new rattler or a new set of cubes for every individual test compared with the interest that is at stake? If you can demonstrate certainly that one brick will wear down more than another I do not think the cost ought to be considered. Then there is another point of interest to the National Brick Manufacturers' Association, that the classification of material shall be so high that every brick street put down will be a recommendation for the adoption of that material. In our little city we have ten thousand inhabitants; we didn't know exactly what we were going to do, and attempted by going to various cities to get a knowledge of which was the better brick. But the trouble was we would find one material in a town standing up nicely, and right along side of it would be almost the same identical brick that would not stand up at all. What was the reason? The reason was in the foundation. In one of our New York towns there are some streets laid on broken stone, some laid on concrete, and one street that is laid on sawdust. (Laughter.) When our Board of Public Works inspected this street they condemned it, notwithstanding the brick used was standard and of good reputation, until questioning brought out the fact that the foundation was defective. When we started out to put down our pavements we insisted on a six-inch concrete foundation, and thoroughly rolled and drained and subgraded. We wanted everything the very best, because we hadn't very much money, and could not afford to pay for anything but the best. (Applause.) When we came to the larger cities and found out the people who had had the most experience with brick streets we could not draw conclusions, because it was seldom found that the brick pavements had been put down under our excellent conditions.

Mr. Ittner: Did you learn the cause of putting that sawdust under that brick pavement?

Mr. Jones: I suppose because it was the most available material, or because they wanted to get it down quick. The point I want to bring out is this: It is almost utterly impossible for the engineers to go to any town to find out exactly what he wants to know, because conditions are so varied. I submit this rattler test of mine to this Convention as a ready means of ascertaining with exactness the character of abrasion and amount of wear that the brick will stand, and then let the reason for the result be found by Prof. Orton's extended investigations into the influence of structure and method of manufacture of paving brick on its wearing quality.

Professor Orton: Mr. President and gentlemen of the Convention, it seems to me that we have had this question pretty thoroughly threshed over by the two men who are best qualified to do it—Professor Wheeler and Mr. Jones—and it seems to me the situation stands about like this: This Association authorized, four years ago, the investigation of paving brick tests. It appointed a commission, that after working two years, gave it a set of tests which were fairly well received by the country at large. Its representatives at that time had collected the best knowledge on the subject of brick testing then extant. But the world is moving and new things are coming up every day. If this Association imagines that the work finished two years ago will stand permanently, and that we are going along perpetually to test brick in this same way, it is mistaken. Mr. Jones's contribution to the subject demands a hearing. Another one of our best members, Mr. W. S. Purington, is loaded full to the muzzle with another discovery, which he can hardly hold down another minute. I refer to the method advocated by Prof. A. N. Talbott, of Champaign, Ill., who has published a brochure on the subject of paving brick tests, in which he attacks our N. B. M. A. method without gloves. I was very glad to see Prof. Talbott's paper appear, for it was another contribution to the literature of the subject. Now, if we expect to have our standard used by the public, we have got to keep working and to keep it up to date. We have got to follow it along from year to year, and as fast as new men come up with new methods we have either got to adopt these new methods or prove that our own are the best. (Applause.) Now, then, on the other side, this Association is one which represents manifold interests. We are not all paving brick men, nor are the majority paving brick men; all sorts of clay industries are represented here, and it is unnatural and improper to expect that the funds of the Association, which are being devoted to experimental investigations for the benefit of the Association as a whole, should be spent continuously on any one line. At present this year's investigation is being made on a line altogether different from that of paving brick. Each year the matter is put before you and you are given an opportunity to vote on a choice of topics for investigation, and whatever you vote to have investigated is investigated. If you want to investigate topics pertaining to press brick manufacture or soft mud manufacture or any other manufacture, I will undertake it just as willingly as I undertook to study the testing of paving brick. It is true that my interest has been greatly aroused by the investigation we began on paving brick, and that I desire to get to the bottom of the subject. I am here to carry out the wishes of the Association, whatever they may be. Nevertheless, I think it is improper that the paving brick men should expect that these investigations, which specially interest them, should be maintained at the expense of the Association year after year, to the exclusion of other investigations. I want the support of the Association from year to year to make investigations, and I want you to select your own subjects for me to investigate, but, having started me on a profitable and fruitful lead, I do not like to be dropped in the middle of it, before having got the facts. I think the paving brick men ought to get together outside of the Association and subscribe enough money to enable the committee to go on and probe this subject to the bottom. This matter which Mr. Purington brings up and that which Mr. Jones brings up must be put to the test. And yet the Association, as a whole, has already spent its share of money on this subject. The cost of future experimenting ought to fall on those whose interests are specially affected.

Mr. Wolfley: In accordance with our custom, I want to offer a motion that we elect Mr. Ross C. Purdy, who has the scholarship for the present year, an honorary member of the Association for the ensuing year.

Seconded by Mr. Eggers and carried.

Mr. Howard: I like the suggestion of Professor Orton that other manufacturers should be represented here besides the paving brick manufacturers. I would like to read a specification for a United States courthouse and postoffice building at Norfolk, Va., wherein the architect specifies a certain class of brick shall be used. The specifications were made by Wyatt & Nolting, of Baltimore, and drawn by Jas. K. Taylor, supervising architect. It reads as follows:

"Common brick: All brick to be of the best quality, well tempered, hard burned, square edged, sound and free from limestone or large pebbles; no bats, soft or defective brick will be allowed to be used. No salmon or dry pressed brick will be allowed at any point in the construction, or at any time on the premises."

Evidently the government of the United States don't do things without an object in view, and, having made the specifications, I would like to ask the expression of men who make brick for this class of work, and under the supervision of an architect, as to their experience in these matters. I want to know why this architect did not want dry pressed brick.

President Richardson: We cannot enter upon the discussion of this question now. I would like to hear it discussed. I would say that the specifications for a government building at Annapolis, Md., specified that the brick should be the brick I am manufacturing, which is a dry press brick.

Secretary Randall: The next on the programme is a paper on "Brickmaking as a Profession," by J. Fred Smith, Omaha, Neb.

—Nebraska and Iowa's Joint Convention.—

Mr. Smith: Before reading my paper I want to extend to each of you gentlemen an invitation to attend the joint Convention of the Iowa and Nebraska Associations, which will be held at Sioux City, Ia., March 1 and 2. I can assure you of a hearty welcome. Come and see what you can learn out West.

BRICKMAKING AS A PROFESSION.

Mr. President and Gentlemen of the Convention:

When our worthy Secretary first asked me to write a paper for this Convention I did not think it the proper thing, as I told him I was a brickmaker and not a writer; but you gentlemen, who know him better than myself, know that when he goes after a thing he has a way of getting it.

I take it that the average brickmaker does not consider brickmaking as a profession. He thinks a lot of clay mixed with water, formed brick shape and burned red or gray is not worthy the name of a profession.

For convenience we will have three classes:

First, we will start at the bottom and go up. We have one or two industrious young men who have saved some money by good, hard work in a brickyard, and they start a small brickyard of their own. Those young men, we take it, are good, honest young men, with very small capital, but masters of the brick business. They start in a small town where the demand will not permit an investment of a larger yard, and nine times out of ten those young men will make a success at brickmaking, will make more money than by working at day work, and will, if the country and town grows, become the influential business men of their community.

On the other hand, I have in mind a man who has been in the business for fifteen or twenty years, and has made a failure all that time, simply because he had schemes and ideas of his own. Four years ago he disappeared, but last year he came back and started again in his own peculiar way; made a small kiln of brick, but when the kiln was opened up it was found that the center was all melted into one mass and around the outside were yellow brick. There were several small jobs to be figured at that time, and as he wanted to sell brick he offered them at from 50 cents to a dollar cheaper than the rest of the manufacturers were selling, and so, you see, this one man, so to speak, established the price of brick—at least the contractors told the dealers our prices were too high, and we could hear it for two months, until he commenced to deliver his brick, but they were then rejected.

The question is, What can we do with such a man in our profession? Old-timers tell a story about the early days of Omaha. They had an organization, and when a claim-jumper came along they would corral him, take him down to the Missouri river and cut a hole in the ice, and then give him his choice between leaving the country forever or taking a cold bath. I have been seriously thinking if we would take those fellows who are continually butchering our profession and treat them as the old settlers did the claim-jumpers, we would soon be rid of them, and it would be a credit to our profession.

Class 2—No doubt most of you gentlemen here in the Convention are members of this class. We have an investment of from $5,000 to $50,000, as individuals, partnerships or stock companies. Partnerships are easier to organize than stock companies, and are good enough if the management is run on business principles; but the trouble is, if the management is poor and one partner has the experience and the other has the capital, the chances are that the one with the capital gets the worst of it, while as a corporation each individual is liable only for the amount of stock he holds.

At one time I thought stock companies were no good, because in my experience, by observation, almost every organization or stock company in our profession had been a failure, but upon investigating the matter more closely I found, in one case, there was no practical experience interested in the stock company. Some would-be brick man got a lawyer and a young man who had fallen heir to an estate interested, and they figured the profit of brickmaking on paper, which, I judge, must have been very flattering, for we now make brick and sell them for $3 per thousand less than the average prices prevailing at the time those people undertook to make brick. The trouble with them was that they never got enough of their product to market—too much went over the dump. This would-be brick man missed his calling, but since that time he has been painting portraits, and, I understand, has been quite successful in his latter undertaking.

I can cite another case of a stock company where two parties had a patent kiln and, organized a stock company to make brick and show this generation that they had the only kiln in which to burn brick. The result here, too, was a failure, but not in the kiln so much as in the lack of practical experience in brickmaking.

No doubt all of you gentlemen brickmakers have in mind similar failures in the profession. Stock companies are all right if the management is interested more in the company than in the mere salary they draw. A good, experienced general manager with stock at stake is the backbone of our profession in any class, either large or small scale.

Class 3—This is one in which a man with a small capital has been successful, and by close attention to the business, as it has increased, has become the master of the profession, and can, after a hard struggle for years, have everything that is modern in the brick business, from the clay bank to the delivery of his product.

Few men attain this class in our profession, not because they are not practical masters of the profession, but because they have not had the opportunity to demonstrate to the world their ability in the profession. They may have lived in a community where the rest of mankind did not keep up with the times.

There has been many a man who has been a complete failure in our profession simply by buying machinery that was not adapted to his particular kind of clay.

I don't want our machine brethren to think for a minute that I am against their business, for without them modern brickmaking would be in the cradle yet.

Brick manufacturers in this class can do more to promote the good of our profession than in either of the other classes. They have had the early experience, know the worth of a dollar, have seen experiments tried for years, have witnessed the ups and downs of the profession, and, now that they have attained the top notch, can demand the best machinery. By long experience they know what kilns are best, and the best of experienced labor is at their command, for they have business, if there is any in the community.

A man or company of this class can have on hand millions of brick, and, if labor gives him any trouble or he thinks they are unjust in their demands, he can close up the works and stand the consequences as long as organized labor can.

Our profession is by no means always on the bright side; we have our labor troubles, our machinery does not work well at all times, we very often get a kiln of brick that are not burned up to the average, and then the trouble commences; you are called up to go down to the building, and then you have a foreman, an inspector, the architect and the owner, and the whole push jump on to you at once, and then you feel as though you wished you had never been born.

But, gentlemen, we have bright and sunny days, too—good, nice weather, and everybody in the yards are busy doing their particular work. It is a pleasure for the proprietor to take a walk through the works and find all going smoothly, and here is when he can give his men a good word; it don't cost him anything, and the men will appreciate it. I do not believe in using laboring men as though they were a lot of brute creatures; they are human beings, just the same as the proprietor is, and they are entitled to fair treatment at his hands.

I know that we often feel as though our employes are not doing their best, but after one season's work is done and we have struck a balance, and find that we have made a comfortable income on our investment, could we not say to ourselves, Let us bury the past and hope for the future to be more pleasant between ourselves and the workmen?

Now, in closing our Convention, let us not forget our duty to our National Association of Brick Manufacturers. We know our worthy Secretary has spent months in arranging the programme and doing everything in his power to make our next Convention more interesting than the last one, and the least we can do is to come and see what is in store for our individual good. (Applause.)

President Richardson: Remarks on Mr. Smith's paper are now in order. Mr. Smith has given us a very good paper. If there is no discussion on it we will pass on to the next.

Secretary Randall: This brings us to the paper, "The Utility of Clay as Roofing Material," by Charles T. Harris, Alfred, N. Y.

Mr. Harris: Gentlemen, I know the hour is growing late, but, while my paper is quite lengthy, I will try to deliver it as expeditiously as possible, so as not to detain you.

THE UTILITY OF CLAY AS A ROOFING MATERIAL.

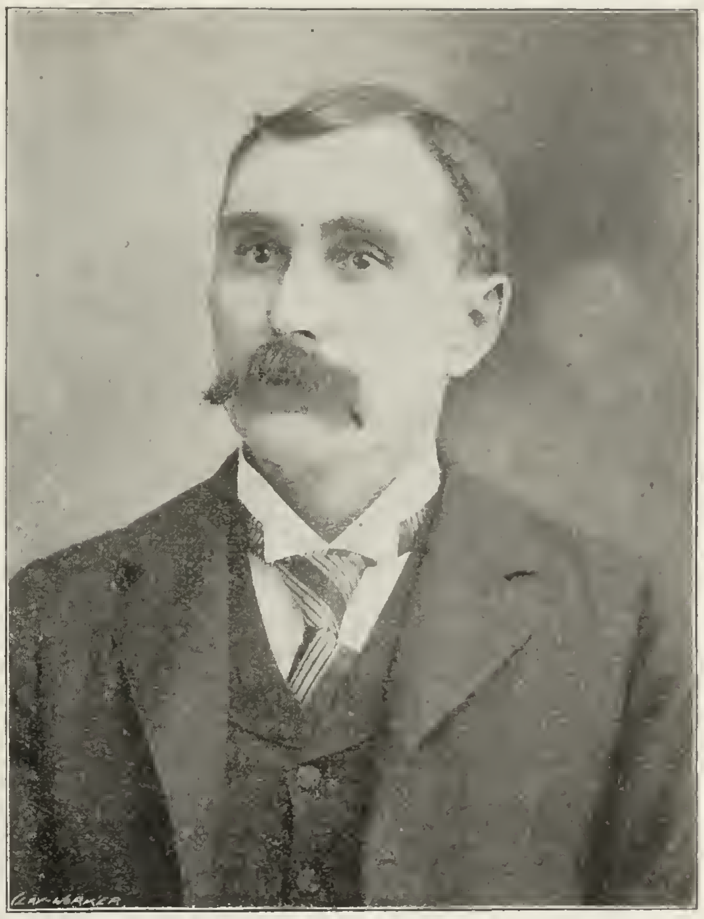
Mr. President and Gentlemen of the Convention:

The utility of clay as a roofing material was the subject suggested by our Secretary in the course of a correspondence in which he urged me to do my share as a member of this Association. Disliking to refuse repeated solicitations extended in his own genial and inimitable way, I finally agreed to say something on this subject, which will serve as well as any other as a string on which to thread a few thoughts of a "glittering generality" character.

"Self preservation is the first law of nature;" that is, primitive man first exercised his faculties as superior to brute creation in preserving and conserving by artificial means his own existence and that of his offspring.

The first necessity of his nature, like that of any other animal, was to secure food. After that, as he rose in the scale of existence from the merely animal, he learned to warm and clothe and house himself as an animal cannot do.

From these necessities, therefore, arose those pursuits that pertain to the securing of all kinds of food, to the manufacture of clothing, to the building of shelter or houses, and to the generating of heat and light. Therefore, all these occupations that pertain purely to man's actual living necessities we have come to call mechanical pursuits.



J. FRED SMITH, Omaha.

In contradistinction to these there are occupations that are in no sense essential to man's existence. They have grown out of his development, have become a great part of his life, and are now inseparable from his surroundings; but they are not primarily necessary to his existence.

These pursuits we call the arts, and classify them as painting, sculpture, music, poetry and architecture. Not one of these is an absolute necessity to, though each of them is an indication of, the growth in the human animal of love for the true and beautiful growth of the human animal, of a love for the true and beautiful and good in creation, and just to the extent that they flourish among a people you may judge of the distance that they have traveled on their two feet from the place that they once started on four.

Occupying a position midway between these arts by which life is embellished and these pursuits by which life is maintained there has arisen a number of employments partaking to a greater or less degree of the character of each, whereby comforts and conveniences are added to man's necessities and his surroundings beautified or embellished to a greater or less extent, and these occupations we call the industrial arts, and classify them under the following divisions: Ceramics, including pottery, terra-cotta faience and porcelain or china; glass in the form of art and cut glass; enamels on pottery and on metal; metal work in bronze, iron and jewelry for decoration and ornamentation, and weaving of tapestry, carpets and rugs.

All these are interesting; all are more or less technical; all require skill of a high order, and call for the display of more or less of the artistic temperament, if the highest success is to be achieved in them. Each of them has a history almost coextensive with the history of man himself, and date back their origin to the days of his first efforts to improve his merely animal existence; but of them all the precedence must be awarded, in my mind, to ceramics, both as it regards the duration of its existence and the importance of its character in helping build up the civilization of humanity. It is this department of industrial art in which we as an Association are interested most, particularly in that branch of it which has been developed from man's necesisty to build himself a shelter and to make it safe and suitable along both mechanical and artistic lines.

Here, in passing, I might be pardoned for referring for a moment to what has occurred to me as a pertinent question for our consideration as a society. In reality we are interested along all lines of ceramic work to a greater or less extent, and our membership is drawn not from one class alone, though it was so, I believe, in the beginning. Yet the name of our Association restricts its field of opreations to a special class of clayworkers. I have wondered if it would not be better and broader to extend the name, as we have already enlarged the scope of our Association into the great field of ceramics in general, cover in our Association work the same ground that our official organ, the Clay-Worker, does in its publication, and have the name as well as the support in our various undertakings of a National Association of Clayworkers, whose annual sessions should include all the brick and terra cotta and tile and pottery workers of the country; in fact, so that every one who used a kiln for the purpose of baking clay should be eligible for membership. Then we could have our separate bureaus or lyceums for the brick men and tile men and the terra cotta men and the pottery men, with general sessions of interest to all, and in this way secure a larger and more effective and more comprehensive support for our department of ceramics at the State University here. That is the way the National Association of engineers, and educators and editors and doctors and railroad men and builders do.

But all this is another story, as Kipling would say; so I turn to the particular subject already in hand, the matter of terra cotta covering for roofs in the form of tiles.

It is always well enough to have a definition of words on any subject up for discussion, so that there may be no possible misunderstanding as to the sense intended to be conveyed by the word used. The word clay, I take it, is understood by us all to refer to the material resulting from the decomposition of feldspathic rocks, whether it be in the form of argillaceous or indurated deposits, either one of which is readily convertible into the plastic condition by the agency of water.

The word utility is defined in the Century Dictionary as meaning useful, serviceable, profitable or valuable, or that quality which tends to produce benefit, advantage, pleasure or happiness.

I have, therefore, decided to place what I have to say as to the utility of clay, in this subject, under the following divisions: its usefulness, its advantages, its benefits and its profitableness.

First, then, no other product of the hands of man has been more permanent in form and more universal in its use than his work in clay. It has helped to secure for him shelter and to utilize water and fire in ways that he could not otherwise have controlled had it not been for materials made from clay.

"Coeval with man's advent upon the globe came his work in clay, antedating his work in stone or bronze, more ancient than any other remains of the hand of man, they exist to-day scattered over the earth's crust, wherever his foot has moved or his hand been put forth to sustain his life." And, coming down through the ages, man's work in clay has kept even pace with his work along all other lines. One writer has said that "the light thrown by ceramic work of the comonest kind upon history may be as serviceable as language itself in promoting our knowledge of the origin of the races, their military expeditions and their commercial relations," and there can be no question that "an improved kind of earthenware for cooking purposes must have closely followed the invention of fire." So, also, as soon as man began to build for himself a house, because his multiplication crowded him out of his cave life, or his local surroundings afforded him no caves for shelter, he naturally turned to this material, which had already been found so useful in other ways, to provide for himself a covering from the storms of summer and the snows of winter.

The most primitive tile used for this purpose was no doubt quite similar to the prevailing type of the present day, which is a simple half circle—laid two under and one over. Scholars tell us that no other words in languages are so persistent in adhering to their early form as those which have arisen from the expression of the domestic life of the people, and that no forms of structure or habits of life are so little subject to change through the indefinite period that man has been on this earth as those which relate to the home life and its habits.

Therefore, it has been said that this form of tile in the shape of a half roll may have been suggested to the primitive clayworker by the shape of the bark which he had previously learned to peel from the trees and overlap on rude supports to keep off the sun. But I am more inclined to the belief that the clayworker in even prehistoric times soon discovered what we all know to be true that it was much easier to model and dry and burn a semi-circular piece of clay than a flat one. I have no doubt that his first attempts were along the line of a flat slab of clay, which spread out as adobe became sun-dried and sun-baked, and in that form served the purpose of flat roofs of the primitive buildings in that section where men is supposed to have originated, a section that was free from snows and subjected to limited rains.

But, when early man moved westward into a variable climate, and had to protect himself against storms and stress of weather, he early adopted a form of tile more protective and more practical; so that instead of trying to dry a flat slab, without its cracking and burn without warping, he soon found that he could secure what he was after much more quickly and economically by forming his flat slab into a half circle, which would dry sound and burn true. Then, too, here was a material which could be found everywhere, and had only to be properly mixed with water and properly fluxed with heat to become the very best sort of a protection against all kinds of climatic conditions. No matter whether timber could be found or not, whether stone could be quarried or not, whether iron could be smelted or not, clay could be found everywhere, and water and heat were ready on call; so that by their cobination man early learned to build himself a shelter, and the argument and justification that has been advanced in discussions in this very society in favor of houses all of clay is simply going back to primitive conditions, after all, for a basis, only now the result is secured along the line of modern civilization, which aims at style and finish and accommodations and comforts, as well as a mere shelter, and can secure all much more easily than the primitive man built his adobe home.

Of course, in countries like this, where in the first few hundred years of settlement, wood has been the most common material and the easiest to get, the shingle has prevailed for a roof covering; but, with the destruction of the forests and the scarcity of first-growth lumber, the shingle must give way to other and better products, and it is a fact that since historical times, at least, no material has been found so universal and, therefore, so useful as clay in various forms and development for roofing purposes.

The use of roofing tile was probably fully developed by the Chinese as a nation at large, just as much else that we have of value in our modern civilization was originated and perfected by them.

Roofing tiles seem to have been used there from the most remote antiquity, and the present perfect condition in their shape and color has been prevalent with them for long preceding the historical era. They have adhered in shape to the simple and primal forms of the curved tile, and in no other country have they reached such a degree of perfection and ornamentation as in China and Japan. They have covered their eaves and ridges and hips with tiles of the most unique patterns and the most exquisite enamelings, in shades of bright reds and oranges and greens and blues. From the specimens of Japanese tile that I saw and investigated at the World's Fair, I think it will be a long time before we can hope to secure any such color effects or striking shapes as theirs; but they have one great advantage—they are old in the clayworking business, and I learned that often their piles of clay, carefully weathered and tempered, are handed down from generation to generation as heirlooms, or capital already invested in the business, which passes regularly from father to son, so that all that skill and experience and readiness can do to secure perfect results are present with them.

From the Orient the roof tile found its way into Southern Europe through Greece and Rome, both of which used the primitive form of Eastern tile, with some slight modifications. Instead of making the upper and under tile of the same size and both of considerable breadth, as is the case with the Chinese tile, they modified the uppertile into a smaller roll, which gave a materially different effect on the roof, as thus the spacing was made apparently much wider and the alignment less conspicuous. The Romans followed along the same forms as the Greeks, with occasional modifications of the under tile from a roll to a flat form, but retaining for the most part the effect of smaller relief and broader lines than the Oriental tiles. But in the western dependencies of the Roman empire, as Spain and Southern France, the smaller top tile of the Greeks and Romans came to be used for both the upper and lower tile, so that the appearance of the roof was changed from a broad alignment to a crowded one of perpendicular lines up and down the roof, more or less irregular in appearance, owing to the warped and uneven character of the tiles used. This is the shape of the tile that was brought by the Spanish conquerors into the Spanish-American sections of this continent, and is known to-day in lower California and Mexico as the old mission tile, because of its universal use on those buildings erected by the church for schools and worship, under the aggressiveness and fostering care of that sect when Spain ruled the greater part of this continent. So far we have followed the use of roofing tile along about the same lines of latitude, aproximately, with where they originated, and where the climatic conditions were essentially the same, and all comparatively mild; but, when mankind began to people the more northern latitudes and to build themselves houses therein, the climatic conditions required a roof covering that should be tighter and more impervious than had been required in Southern Europe, and so the Hollanders and other dwellers in the more northerly section came to combine the double tiles of the Orient into one tile, which, with their sense of economy in work and material, could be made more cheaply to cover exactly the same space, and at the same time give a greater weather protection. Thus the so-caled "pan tile" or "Dutch" tile was produced. These were the forms of tile that were earliest introduced into England, where they are even yet known as Belgic tiles, which shows their origin conclusively.

But England was never partial to the rolled tile in her architectural development, either for effect or efficiency, and early learned to make a good flat or shingle tile, which has thus been more largely used there than on the continent, and which seems much more appropriate to her prevailing styles of architecture.

The forms of tile already referred to have been the prevailing ones since man first made clay tile for roofing purposes, and all our modern form of tile are simply modifications or combinations of them in some shape or other, with the possible exception of the interlocking tile of Southern Germany, which has a character and development peculiar to itself.

This country can hardly be said to have done much in the way of developing the use of roofing tile as yet, as the oldest plant now successfully operated in this country is not yet twenty-five years old. Most of our work has been along the well-defined lines, so far as shapes are concerned, already touched upon, though some of us are aiming to produce a tile that, while it shall conform to the architect's requirement for trueness to the style on which they want to use it, shall at the same time be able to contend successfully with the very severe and changeable weather conditions that have to be met over the great extent of this country, without being obliged to depend upon cement of other extraneous materials for a weather-proof roof aside from the tiles themselves. Of these modifications in shapes and their various merits, this is not the time nor I the man to speak. What I have said serves to show the great extent in time and space of the use of tiles for roof coverings, and hence their usefulness therein.

I take it that there is not much of interest or novelty to be said to you with reference to the advantages of the material. The stock arguments in favor of all well-burned clays, with which we are all familiar, holds true especially regarding roofing tiles. We know that it is the most durable of all roof materials, when properly made and laid; that it cannot be broken by hail or split by alternating freezings and thawings or slivered by heat like slate. But it is also a fact that it is a more comfortable roofing, because it is a nonconductor of heat and cold, and keeps a house, therefore, cooler in summer and warmer in winter, and tends to reduce the difficulties of condensation, from which all roofs suffer to a greater or less extent. For southern latitudes this makes it an especially desirable roof covering, as well as the fact that it is not a germ producer or harborer, and, therefore, more sanitary. In these days, when microbes with wonderful names and fearful conditions, are multiplying at a rate that defies competition, and many new diseases are springing up as concomitants of our complex civilization, it is worth something to us to know that we clayworkers are the only fellows that can supply a material impervious to these microscopic conditions of disease and death, and that a house built with clay throughout is, after all, the only real and pure and proper and safe domicile for a man to live in.

With a tile roof you are safe against chances of catching fire from some other fellow's careless conflagration, and in these days of electrical disturbances of great atmospheric severity you are safe from all chance of being touched by ligntning after you have been touched by the tilemaker, for your tile roof is an absolute nonconductor of electricity, and saves the original expense of several unsightly rods stuck above it to impale the lightning at the same time that they decorate the dwelling with arrow points.

In addition to all these advantages there is a benefit to be derived from the use of roofing tile which is inseperable from the home building of every man, whether he be a savant or a savage. So far as his development carries him he wants the home of his family to be attractive; he wants it to be not only a protection against weather conditions without and a source of comfort and happiness within, but he also wants to secure these results with an accompaniment of beauty and attractiveness, so far as his means will allow, and when, by the multiplication of plants to make this product, and the consequent reduction in handling and freight charges, and the greater facilities in securing economical production, the use of tile has been brought more largely within the reach of all than is now the case, the tile roof will have added many degrees of finish and worth and beauty to the homes and public buildings scattered over our country, of which the average man is proud and in which he takes delight.

As yet we are in the primar period of clayworking in this country except as it regards building blocks in the form of brick or terra cotta In that line we probably lead all other peoples to-day in variety and beauty; but in tile, terra cotta figures, faience and pottery we are at the beginning of our development of a line of industries that in coming years will be surprising in their character and extensiveness, as has been our development already along some other lines of the industrial arts.

This brings me to my last heading under the utility of clay as a roofing material—its profitableness—and this is the one of greatest interest, after all, to those who are here.

I have no experiences of value to publish along this line, and no suggestions to offer. There can be no question of the possibilities of the product, from what I have already said, and there is only one way to find out what you can do with it, and that is by trying. You all know that there is no rule for the worker in clay except the law of his own experience. Clays right in the same neighborhood require different treatment to secure identical results. Whether you have at hand indurated or argillaceous clays, only the actual work with them will tell you what you can do with them, though, of course, analysis and experiment will give an approximate knowledge of what may perhaps best be attempted or not attempted. I have stated my belief before, at a previous session of this Association, that any clay that will make a good roofing tile will make a good brick; but I do not believe that any clay that will make brick will make good roofing tile. There are reasons for this that we will not have time to go into now. At first they used a clay at the works where I am now interested, and then a shale and clay mixed, but since my connection with the company we have never used anything but shale alone, without any grogging, and, so far as I know, the best results in the manufacture of roofing tiles is to be obtained from shale. This is no doubt due from the fact that they are homogeneous, and seem to have about the right amount of fluxes, in the proper proportion, to secure a vitrified product. Of course, if you are not seeking vitrifaction, argillaceous clay can be used with perhaps such results as you are seeking.

Our shale lies in the Upper Devonian period, and is at the highest point of this deposit in New York State, being on the extreme southern line and about 2,000 feet above sea level. The shales of the corboniferous period, which is later than the Devonian and lie further south in its outcroppings, are also used for purposes of securing vitrified products in clay with good results. I think that most, if not all, of the shales of this State are of this period, and have, so far as used, given very satisfactory results.

It requires about 22 per cent. of water to make a workable paste in our shale; the shrinkage is about 4 per cent. in drying and 8 per cent. in burning, while the tensil strength of air-dried briquettes, as given by our geological survey, is on the average of sixty-one pounds to the square inch, a very high average.

Below us, at Jamestown, on the west, the average strength of the shale from which paving brick are made, is only sixteen, and at Hornellsville, on the east, where pavers are also being made from shale, the strength is only thirty-nine. Both of these shales are in the Chemming period of deposit of the Devonian era.

Thus you see that shales in the same section and of the same period of formation give quite different results in manipulation, so that the whole question, when it comes to manufacturing, is simply one of purse to start with and profit to close with, and that can be absolutely settled only by actual experience.

My opinion is that, in proportion to the capital invested and responsibilities involved, no one of the industrial arts, so called, are as profitable as are mechanical pursuits to-day.

The making and supplying of necessities pay. The flour and pork and produce business show a large per centage of profits in proportion to the capital and experience invested in them. Clothing and coal and lumber and leather make the man that handles them rich. But the supplying of man's wants along the line of his tastes rather than his necessities, as a rule does not secure as remunerative results for the man who makes the investment.

Out of the necessities of his fellow men, man has made for himself abundant means; but out of the tastes of his fellow men he has multiplied for himself many troubles.

Finally, as one of the great army of clayworkers here represented, I feel like paying more than a passing tribute to the possibilities of our business and the adaptability of our material. We have Scripture for it that the grandest work in all nature, man himself, is made from clay. We know that no other material has been of more universal and valuable use to man, both as regards his necessities and his luxuries. We have every reason to be proud of the fact that not only some of the grandest works of men, but also some of the most beautiful and delicately wrought and ornately ornamented, have been from the same material out of which we here are to-day striving both for support and comfort. With the experiences of all the past to profit by, we have boundless possibilities in many directions for the future development of the utility of clay in infinite ways as well as in roofing tiles.

This variety of use and possibility of development adds a zest and pleasure to its pursuit that is foreign to the lines where everything is a known quantity and the lines of work are already fast fixed.

With such a business, carrying within itself so much of lasting good and benefit to humanity, we not only have a right to be proud and self-respecting in our work, but we owe it to ourselves to demand a full and fair recognition not only of our importance among allied industries but also from the professions which we aid so much.

The architect should recognize in us his most able assistant; the doctor should see us as his coadjutor in securing sanitary and hygienic conditions; the lawyer should sacrifice his sense of litigation to his desire for a more general safety, and even the preacher should discourse a more beautiful and broader theology, if pronounced from a pulpit surrounded with the delicate and beautiful ornamentation and coloring to be secured from clay, and under a roof covered with artistic terra cotta tile. And so I say

Oh Clay! thy work and worth to all mankind,
True parent primitive of everything,

CLAY-WORKER.

CHARLES T. HARRIS, Alfred, N. Y.

By hand of man from nature wrought, I sing.
First element in man himself, the mind
Of the Creator made thee king in kind
Of all His other creatures; from thee spring
Most beautiful and blest of earthly thing,
The human form divine; in thee men find,
Oh Clays! their history writ on shape of urn
Or pot or ewer; on they plastic face
The delicate detail of molded form
And blendid coloring has found the place
To build and beautify the home of man—
Look on thee with disdain, let him who can!
(Loud applause.)

Mr. Pike: I move a vote of thanks be extended to Mr. Harris for the very ably written, as well as ably delivered, paper to which we have just listened.

Motion seconded by Geo. H. Albertson and carried.

Mr. Purington: On leaving the hall last evening a former officer of this Association said he hoped Mr. Eudaly and I would keep still to-day and give the boys a chance. Now, I have kept still all this time, and I am going to keep still after this. I don't suppose any of you know that I am what is known as a chalk talker. Well, I am, and I want to give you a little practical illustration of the profitableness of roofing tile. The last brick plant that I built has no insurance on it, and never has had. It is built entirely of brick, with as little wood as we can use, and has a tile roof. I do not want to go into details. We have been laboring for years to get a reduction on our insurance, and about two weeks ago we had an insurance inspector come out and visit our plant, and it is to illustrate what he said that I have made this little drawing. Between two of our buildings we have a little building that has a tar and gravel roof. After going over the plant and looking at it from every side, he said: "I tell you, if you will take off that tar and gravel roof on that connecting building, and put on a tile roof, I will reduce your insurance about 15½ per cent." (Applause.)

Mr. Bloomfield: There is one point Mr. Harris did not touch on, and that is a question that I think very important—the question of repairs. A tile roof, if properly put on, will last a lifetime. An ordinary tin roof or a tar and gravel roof wants repairing constantly. Three years ago I spent nearly $300 repairing a tin roof, and I have got to do the same thing again. A tile roof will last forever.

Secretary Randall: I can give similar testimony. I built a little home of my own, four years ago, and put a tile roof on it, and it has not cost a single penny, and is not likely to, so far as the roof is concerned.

President Richardson: I think Mr. Randall makes that explanation because he built a frame house. (Laughter.)

Secretary Randall: The next on the programme is a paper by Mr. V. H. Kreigshaber on "A Plea for Uniform Terra Cotta Specifications." Mr. Kreigshaber was not able to meet with us, but he has sent his paper, with the accompanying letter, which I will read:

ATLANTA, Ga., Jan. 30, 1899.

T. A. Randall, Secretary N. B. M. A.:

Dear Sir—I have just written an article on a subject that I hope will be of more practical use to the trade than the one assigned to me. I inclose the paper, which is "A Plea for Uniform Terra Cotta Specifications," and which I trust will meet with your approval.

I have been away from home for some time, and my business engagements will prevent my being present at your meeting, which I regret very much, indeed.

Wishing the Association the best of success, I am, sincerely,

V. H. KREIGSHABER.

A PLEA FOR UNIFORM TERRA COTTA SPECIFICATIONS.

Mr. President and Gentlemen of the Convention:

I believe that I am safe in making the assertion that there is not a single manufacturer of terra cotta in the United States who has not at one time or other during his experience felt the results of illogical, unjust and impractical interpretations of terra cotta specifications, or who has not had similar experience working under specifications written and designed by parties who have never had any practical knowledge of the difficulties attending the manufacture of architectural terra cotta, and who probably in all their experience would or never could secure the information. Specifications covering architectural terra cotta are not to be feared so much as the interpretation that may be placed upon the wording of same, either by ignorant or maliciously inclined superintendents.

The tendency nowadays is to simplify matters of this kind, and by a full, free and frank discussion of the subject open to the architects and contractors a clear understanding of what they are entitled to and what they may expect to get. It is, for instance, unreasonable for an architect to specify that terra cotta should be of uniform color, and then interpret it to mean that every piece in the kiln should come out the same shade. The writer has had experience of that kind, and with difficulty explained that it was almost impossible to carry out such specifications. It is not required of the brick people, then why should it be asked of the terra cotta manufacturer? I have frequently pointed out to the architects the fact that such a specification is not only impractical, but unnatural. Nature herself does not create her building materials, stone, for instance, so that every piece is the same shade and color, and if we are to be natural about our work then it certainly is the aim and destiny of art to copy nature and not to attempt the impossible.

Another clause which we often meet with in terra cotta specifications reads about as follows:

"Terra cotta must be straight, true to line, free from cracks, flaws or other inperfections." This is a clause which may mean little or it may mean a great deal. A small piece of terra cotta can be made absolutely straight, but it is difficult for even those most skilled in the art to say the same thing in regard to larger pieces. The specifications covering the straightness of the work should say to what extent a variation from a straight line will be permitted, and that variation might, with good judgment, vary according to the location of the terra cotta in the building. Those pieces on the lower stories of the building should be required to come nearer a straight line than pieces that are from five to ten stories high.

Architectural terra cotta is used, as we all know, for exterior ornamentation. No matter how the material may look when examined closely on the ground, if it fills out its position properly in the building, without marring the harmonious blending of all the various details, then it certainly fills the specifications on that particular point. If, for instance, a large piece of terra cotta cornice should vary from a straight line as much as an eighth of an inch in a foot, and this variation should become absolutely imperceptable to the eye when the pieces are placed in their proper places in the building, then it is certainly immaterial either to the owner, contractor or architect that this variation does actually exist.

Another specification that I have had experience with is one that requires the body of the work to be the same color as the slip coat. The slip coat is the result of modern practice to match or harmonize the color or shade with the brick or stone that is to be used in the building. It is comparatively easy to greatly vary such shades as the occasion requires, but it is a difficult matter to carry these color variations through the entire body of the work. Where a slip coat is properly applied and thoroughly burned in, and fused to the surface of the work, there is no reason why this should not be considered satisfactory by the architect or superintendent, and a specification which will protect the manufacturer should by all means cover this point. A fire crack which may occur on any part of the work except the face which would not be of such serious note as to effect the durability of the piece should not necessitate its rejection.

I believe that a set of specifications carefully drawn and which will eliminate a good many uncertainties covering unjust and impractical interpretations would be of incalculable benefit to the terra cotta business. It would materially add to have such specifications approved by the different architects' associations throughout the country, with the recommendation that they be followed by their members in specifying such material, and I trust! that this suggestion will be the means of starting some movement of that kind. (Applause.)

Mr. Gates: Of all the many troubles I have had, there never have been any of them connected with the subject of that paper. My own trouble has been, first, to get the job, and then look at the specifications and see whether the job is set or we furnish it. Preferably, we set it ourselves, but the specifications we have always considered as immaterial, and so, I say, this has been the least of our trouble. It does not matter what the specifications are; we have got to satisfy the architect. On one job we had I found the man—an enemy to terra cotta—going over the building with a rule, and he called me and pointed to a column with a rounded bevel and asked me if that curve was right. I said, of course it was. (Laughter.) He called a carpenter to him and said: "Make a templet and measure up that column." Of course, the carpenter went to work, and I took the superintendent out while the man was making it. Of course, there was only one door where we could get out, and when we came back and looked to see if it fit, we found it was all right. We have got to satisfy them, anyway.

Secretary Randall: The next in order is a paper, entitled "Modern Methods of Drying Brick," by Jas. W. Tester, Montreal, Canada. Mr. Tester is detained at home by illness, but Mr. Carson will read his paper for him.

NATURAL VERSUS ARTIFICAL DRYERS.

Mr. President and Gentlemen of the Convention:

An inspection of the series of Convention reports will about convince you, as it did me, that the subject assigned to me has been pretty well covered, for the dryer has had considerable attention from various points of view at every Convention, so if I seem to be threshing over old straw the fault is not mine, but of the powers that be. The advantages of artificial drying can be divided into two classes, namely, those that admit of no controversy and those that are not yet fully conceded by users of nature's system. In the first we have economy of real estate, ability to dry bricks at all seasons of the year, regardless of wind or weather, a means of meeting the natural peculiarities of our material by close and accurate conditions of heat and circulation, making it possible to successfully dry bricks that could not be dried, and pay, by the outside process. We also have a certainty of the time when the bricks made to-day can go into kiln, making it easier to get together and keep a superior body of workmen. On the other hand, the only point of importance not conceded is, I think, the immediate financial economy, and this only by manufacture of small capacity, reducing it to a personal question as, "Will it pay me to build an artificial dryer for a capacity of say 30,000 per day, it may be all right for the big fellows who figure their output by tens of millions, but I don't think it fits my case?"

There is not, to my mind, a single advantage to a large manufacture that does not apply to his more humble brother—in a modified sense, perhaps—but still of sufficient strength to be of material benefit. All the advantages previously enumerated as inconvertable apply with equal force to any manufacturer, large or small, but the former certainly feels the financial economy in a greater relative degree as so much per thousand saved, each multiplying his total make by that figure. It is not right to figure so much for coal and attendance against the artificial dryer and call that loss, because we get the heat of the sun for nothing and the wind forced on us, there are many other points which, if carefully considered, may cause us to figure the other way. There have been instances repeated occasionally when the free heat of the sun was an expensive commodity and the prodigal wind anything but an advantage. There have been times when the rains have descended and the floods come and we have not been home to boss the reception, consequently our day book shows an amount of loss that would pay for several tons of coal. All these little things must be figured on when computing costs of drying, adding thereto the wages of the extra men required when running to yard or hakes. Artificial dryers, as they are now built, are models of compactness, reliability and efficiency. Every detail necessary to successful operation seems to have been made an especial study, but still we hear of isolated cases where they have been supposed to fail. I say supposed advisedly, because I cannot understand how they can fail if properly and intelligently operated. I am inclined to think that if the failure (not failure to dry, but failure to come up to guarantee) has been it is the fault of the dryer men and the party operating, and not of the machine itself, and this is made possible by excessive guarantee for the size of the machine erected. To meet competition and make a sale it is sometimes necessary to cut down the length and number of the tunnels to the very edge of possible failure, allowing no margin for the imperfect understanding of the tyro operator. We hear of bricks being dried in sixteen hours in a dryer of such and such dimensions, and jump to the conclusion that this is our mark, not taking into consideration the possibility that our clay could not stand it. This is a grievous mistake, gentlemen, and suggests saving a dime at the expense of a dollar. I would like to make a point here, and it is this: When erecting an artificial dryer make it of ample size, and if possible have long tunnels rather than an extra short one. A tunnel 100 feet long is very much better than one 75 feet, especially if the material is inclined to be tender. In our own case we have a six-rack steam dryer 100 feet long, capacity 50 M. per day. We have had no trouble drying these from a Penfield stiff mud machine in twenty-four hours; in fact, have on occasions taken bricks out dry under that time, and the same can be said of our dry pressed, both plain and ornamental, but we would not presume to say that all clays would show the same result in the same dryer, but do believe this, that any clay can be dried successfully in the modern up-to-date steam dryer if given the requisite capacity for the reason previously given, "that in this system we have a means of meeting the peculiarity of any clay by close, positive and accurate conditions of heat and circulation. The question of economy is largely a matter of local conditions, depending as much on the layout of the plant as on the dryer itself. Therefore, to get the maximum of economy we must have ample boiler capacity, ample dryer capacity, the dryer entrance in close proximity to the machine and its outlet to the kilns, and, as it is on the continuous principle, the circuit from the machine and back again must be as direct as possible, avoiding all unnecessary transfer cars or tracks. We must convey the steam from boiler to dryer by the most direct route, avoiding elbows or sharp turns of any kind as much as possible, and preventing premature radiation by a proper nonconducting cover. We must also have a man in charge of it who is in love with the system, who will make it a matter of personal honor to get the most out of it, both of capacity and efficiency. To do this he must (for a time anyway) study the varying conditions of the weather and their effect on the circulation and other workings of the dryer. He must find out the maximum limit of temperature that can be safely carried, and other little points that once mastered puts the drying operations on a safe and satisfactory footing, as tersely put by Brother Purington at Cleveland: "For the last five years no part of my business has given me so little trouble as that of drying bricks. I don't give any more thought to it than to the running of the machine," and this, gentlemen, is our experience. Another quotation from the same report, which especially emphasizes my remarks, and for which Brother McAvoy is responsible: "With one of our steam dryers we are drying a brick that it is impossible to dry with the sun and wind. Without a dryhouse we would have to quit making bricks." And our late Brother Dingee said at Washington: "Before the introduction of dryers the average yearly work by either hand or machine was 150 days, from April to November. Now we can manufacture 212 days." It is true these remarks were made some years ago, but subsequent developments in dryer construction have only served to establish their truth.

In conclusion, gentlemen, I want to say that as current operations in every branch of art or manufacture are showing a decided tendency to more scientific methods, methods from which all vestige of chance is eliminated, methods in which every detail of the business occupies its own particular place as one wheel in a complete machine, and where each motion must be a positive one, we clayworkers must perforce adopt the same methods if we wish to hold the proud position we have attained in this age of progress, remembering for our own good that the strength of a chain is as its weakest link. (Applause.)

—Drying Brick—General Discussion.—

President Richardson: This paper is now before you for discussion.

Mr. Dibert: I would like to hear from the hot-air dryers. We have these dryer men hunting us up all the time, and I would like to hear something about the hot-air drying.

Secretary Randall: There seems to be no one here who cares to talk along that line. We will take up the questions. Question 22 is: "With a dryer 100 feet long, with a forty-foot by two-foot-square stack to each tunnel, and utilizing waste heat from kilns, using a blower, are the conditions for drying improved by having the doors open at the end where brick are put in, which are nearest the stacks?"

Mr. R. G. Eisenhart: I leave mine open, but I have no natural draft; I have a forced draft. This man can find out very quickly by trying it himself. I have no stack at all.

President Richardson: You mean you leave the doors open at the receiving end?

Mr. Eisenhart: Yes, sir.

Secretary Randall: The next, Question 23, reads: "In a dryer utilizing waste heat from cooling kilns and using an exhaust fan, how can the heat be more evenly distributed, heat going into the dryer at 300 degrees at one end, only registering 100 degrees at the other end, heat being put in through one tunnel under dryer cars, each tunnel getting its pro rata?" There seems to be no reply to this question. I guess the dryer men have all succumbed to their dryness and gone out to get a drink. (Laughter.) Next is No. 24: "What is the most economical method of mining and preparing clay for the dry press process?"

President Richardson: Of course, that would depend on what the man really means by mining clay. A great many dry press brick makers take the clay from the surface, harvesting it in the summertime, but I think that is not what the man means. The way we mine our clay for the dry press process is by sinking a shaft down about seventy-five feet, pursuing the method adopted by miners, practically, in getting the clay into carts and hauling it to the top of the shaft or elevator. It would be impossible for any one to answer that question because the conditions are so different. Sometimes they tunnel right under the clay. I think we had better pass to the next question: "What is the cause and what the remedy of the seam in the face of dry press brick?"

Mr. Plumridge: In making the brick it is caused by pressing the clay equally from both sides. The remedy is found in the motion of the upper and lower arm pressing the brick in a way to take the air out of the brick and press only the clay. If you get a motion equal alike on top and bottom, you get the seam in the center. If you run your upper arm down lower, the seam will be lower down on your brick, and if you can get the air out entirely by the mechanical motion of your press you do away entirely with the granulation.

President Richardson: Then your idea is that the seam is caused by the air in the brick?

Mr. Plumridge: In not getting it out properly.

Mr. Carson: My thunder is about gone. I had written a few remarks on that question, but I had not intended to give it, but I have been asked by two or three parties in the Convention to follow this matter up.

—What Is the Cause and What the Remedy of the Seam in the Face of Dry Press Brick.—

Mr. J. W. Carson: This question came before the Convention at Chicago, when I tried to answer it. The reasons I gave then still hold good, with this difference: there are now a less number of dry press machines that have this defect. This defacement of an otherwise perfect brick is caused by the air in the mold, which enters with the loose, granulated material, which also imprisons some of the air already in the mold. If the pressure was exerted all from one side, either top or bottom, the weakness would be on the side of the dead abutment. If the pressure is applied equally and simultaneously from both sides, then the weakness, or seam, will show in the center of the face, and, as the pressure varies from equality and simultaneousness, so will the seam vary its position; but a pressure exerted from each side, equally, but alternately, with the other side dead, or at rest, will produce an even-faced brick, which is further improved in density and finish by another pressure given simultaneously from both sides. This third pressure is obtained in a variety of ways, with which you are doubtless familiar. If you will notice where this seam occurs, it is most pronounced in thick bricks, and often not noticed at all in bricks of Roman thickness, both made on the same machine. The dryer the material the more pronounced the seam, and vice versa. I have noticed this repeatedly on the truck standing in front of the machine, and also when unloading the kilns.

V. H. Kreigshaber, Atlanta, Ga.

The penetrating power of pressure is simply illustrated by the footprints on the loose clay lying around the floor. (By this I don't mean dust, but the accumulation of brick clay in moderate bulk.) Absolutely dry dust will not retain footprints, but, in the proper condition for dry press brickmaking, will retain a perfect outline of the shoe or foot, and will be pressed to a certain thickness, according to the weight or pressure applied; below that it will be soft, or as the balance of the heap.

Steaming the clay after reduction will very much lessen, if it does not entirely remove, the seam. I remember, and so will many of you, that in the early stages of the dry pressed brick machines holes were bored through the die plates to allow the air to escape. These were not effective, because the principle was wrong, as indicated by the footprint illustration. At the first application of pressure the clay nearest the plate was "caked," effectually preventing the escape of the air and defeating the object of the holes. On one machine (now defunct) I tried the experiment of drilling a series of fine holes around the inside of the mold, where the seam would be, and was delighted to find no seam in those bricks, but there were slight marks that spoiled the bricks for fine fronts, and, after awhile, we found it too much trouble to keep the holes open, so abandoned them, and, a little later, the machine. After this experience we were careful to buy a machine that did not make seams. This defect has been the cause, to my knowledge, of prospective manufacturers leaving the dry press process severely alone, and buying other process machines in their stead. There is this consolation, however, to devotees of the dry press process: whereas, formerly, seamy dry press brick were common, now they are decidedly uncommon, and are made only by users of antiquated machinery. By recognizing our imperfections we may hope to improve, and machine men have recognized this so fully that nowadays no machine is admitted a good one, no matter what other point of excellence it embodies, if it has this imperfection. If the party asking this question has a machine that makes seamy bricks, and cannot afford to replace it with one that does not, I would advise him to use his clay as damp as possible, damping it either with water at the dry pan, if he uses one, or, if he uses a pulverizer, do it with a steam spray above the hopper. This is the only cure—short of killing the patient—that I know of.

CHAS. H. BRAY, Helena, Mont.

Mr. Ittner: I do not care to say much on this subject except to call attention to the form and character of this question. It is evident that the person propounding that question never saw a dry press brick without that seam in it. It is true that, as Mr. Carson has said, we formerly saw more of this than at present. Presume at present that the majority of brick made by that process are devoid of that seam. We operate presses made by the same party. We have a pressed and an ornamental brick plant. They are separated about seventy or eighty feet. Our first machines show this defect—that is, if it can be called a defect; some do not so regard it; some people are not discerning enough to notice it at all. It is only by standing right in front of a wall built of brick with this seam that it is easy to see it. Both of the gentlemen who have spoken have, so far as I know, stated the true cause of this seam. I think it is caused by the upper and lower pressure meeting in the center of the brick. We use the same make of machine for our brick. All our brick are press brick, our common brick as well as our fine brick, and we make all our brick by the same machinery, except in making fine brick, pressed or stock brick, we pulverize the clay finer, we work the machine slower, handle the brick more carefully, the setter only sets about half the quantity, and in that way, having a nicer die, keeping it in better repair, we have as fine face brick as are made anywhere, but our brick don't have that seam.

President Richardson: What do you consider the cause of that seam?

Mr. Ittner: So far, I think the speakers before me about stated the case. I have not considered it as closely as they have. My opinion is they are right. Now, as to the remedy, and that is an equal movement of the bottom and top plunger. The air may have some influence, but, as I have stated before, I attribute it to the two plungers, the top and bottom; they start at the same time, move the same distance and finish up at the same time, and then the pressure is relieved and the brick pushed out. The air may have some influence, but I do not think it does; still, I do not want to be understood as saying that it does not. I have heretofore called these seams the birthmark of the dry press brick in speaking of this subject. I think, if the arms should move differently, say, for instance, the top arm move twice the distance of the lower arm, and then, before the pressure is relieved, the brick begins to move and it gives it a polish by this friction with the sides of the mold, and in that way the seam is obviated.

Wm. Cannan, Jamestown, N. Y.: Why is it that we can put water in the clay and wet it, and it will take away this seam? Air will be in the clay, wet as well as dry.

Mr. Carson: No, sir; if you press your brick dry the air prevents the adhesion. By wetting the particles you distribute the air.

Mr. Plumridge: The moisture you have simply hides it. The seam is there. In pushing the brick out of the mold when damp it is polished. Mr. Ittner is right in his theory. I know that sometimes, in making common brick, the upper arm travels farther than it should, and the seam is less prominent. The machine men want to do away with this difficulty. They are making mechanical improvements all the time, and they will make a machine that does not show this granulation.

President Richardson: I do not think we have got to the bottom of this question at all, but it is too late to go into it. I think we ought to go to the bottom of the question. I do not believe that the theory that has been advanced in regard to the air is right. I do not believe it can be proven. Some of the gentlemen have made tests by putting air holes in the center of the mold, but, with all the air holes that are made by some of the dry press manufacturers, they cannot eliminate the seam. It looks to me as though this is the cause: You have a box of dry clay, six or eight inches deep, and if you start these two arms moving, coming together, they are moving that clay toward the center; the particles of clay in the center are not moving very much, but all the other particles of clay are, and as they are moving on the face of the mold they become polished and there is no seam, but in the center that part of the clay that does not move on the face of the mold shows a seam when the brick are made. If you can get a movement of the particles of the clay in the center as well as that at the top and bottom you can remove that seam.

Mr. Ittner: I think what our President has said simply bears out what the rest of us have been saying. I started to tell you about our machines a little while ago. The machines we are using for our finest brick are made by the same firm as the other machine, and of the same order; apparently you cannot see any difference, but in the last machines made there is a little difference in the movement. The top arm moves a greater distance than the bottom, and before the pressure is released the brick begins to move, and there, you see, it gets that polish on the side of the mold, and produces the effect of the obliteration of the seam. So far as the dampness of the clay is concerned, it has nothing to do with it, except that the nearer you approach dampness in clay that line will go away, because the clay is more plastic and easier to press when damp than when dry. It is the dry particles that come in the center of the brick and are not affected by the pressure.

Secretary Randall: I believe the mechanical movement machines have nearly obviated that trouble. What little observation I have made along this line is that the brick we once considered the only dry press brick—the hydraulic press brick—shows that seam more than any other brick in the market. We have with us a gentleman who not only knows what he does, but the cause of it, ordinarily. I would like to hear from Mr. Ellis Lovejoy, Union Furnace.

Mr. Ellis Lovejoy: I do not know that I can add anything to what has been said on this subject, for I have never had any experience with the seam in face brick. But since our President spoke a moment ago, I think he has hit the nail on the head. I do not believe, from the few moments I have thought of it, that the air had anything to do with it; that it is entirely in the motion. We have a press that gives a sort of a combination motion—the old Whittaker. We also have a Boyd press, in which the motion comes down from the top and stops, and comes up from the bottom, and the whole thing is then left under pressure for a moment, and is then lifted up out of the mold. We are not troubled with the seam or granulation in our brick.

Mr. Wittmer: I have had a little experience in making dry press brick, and I think this seam is caused by two things. One is that it occurs where there is the least pressure and the most air. The least pressure is at that particular point; the most air is forced to that particular point. If you make your brick of clay dry enough to run your machine fast enough you can split your brick at that particular point. If you will start your upper arm first and let it travel most, you will find you will lower this seam. If you have both arms moving alike, you will have it exactly in the center, and speeding your motion up merely smears that part over. If you use steam instead of air to dampen your clay, steam containing no air (of course, we know that steam is composed, the same as fog, of bubbles that contain no air), you avoid it to a great extent. So, I say, there are two causes—lost pressure on your brick at that particular point, and the most air being pressed to that same particular point.

Mr. Hoagland: I move we adjourn. I would like to leave this last question until after dinner.

Mr. Adams: I second that motion.

Motion carried.

FIFTH SESSION.

Thursday Afternoon, Feb. 9, 1899.

President Richardson: The time has come for opening our last session, gentlemen, and you will kindly come to order. The Secretary will announce the order of business. First, gentlemen, if you will indulge me for a moment, I want to read a message from W. H. Hayward, Secretary of the National Association of Builders, now in session in Malwaukee, which comes in answer to our greeting of yesterday, suggested by Mr. Adams. It reads as follows:

—A Message from the Builders.—

Milwaukee, Wis., Feb. 8, 1899.

T. A. Randall, Secretary National American Brick Manufacturers.
Columbus, O.:

The National Association of Builders extends its thanks for kind message just received. The same to you. Although our meeting is not the largest yet held, it is, nevertheless, successful, and promises good results for the future.. WM. H. SAYWARD, Sec'y.

Secretary Randall: The next paper on the programme is entitled "Some Faults of Modern Clayworking Plants," by Anders Persson. Mr. Persson intended to be here, but for some reason has been detained. He did not send his paper, so we will pass on to the next, which is a paper on "Coloration of Clay Wares," by A. V. Bleininger, of Columbus. I want to say, by way of introduction, that Mr. Bleininger is the young gentleman who served us so well last year as the experimenter for the Association at the Ohio State University, and of whom Prof. Orton spoke so favorably yesterday. He has rendered this Association invaluable service. (Applause.)

COLORATION OF ARCHITECTURAL CLAY WARES.

Mr. President and Gentlemen of the Convention:

In modern architecture, as in the days of old Greece, the element of color is an important factor, one which is contsantly growing in significance, and with which manufacturers of architectural clay ware will have more and more to deal. The skillful and refined application of color effects, cold and warm, light and dark, expressing depth, relief and brilliancy, must and will be associated with our architecture. This is as it should be. We have had enough of monochrome, of monotony.

As clayworkers we cannot make the aesthetics of color our main study, since this is the field of architects, but with us the question arises: Is the clay industry able to cope with the problem of polychrome architecture? To this question there is only one reply, Yes, it is most naturally suited for the expression of color. For, have we not at our disposal clays of every hue and shade, mineral coloring materials and various technical processes by means of which the most exacting demands as to color may be satisfied?

Within the limited space of this paper it shall be my endeavor to make a brief survey of the technical field dealing with the coloration of clay ware, staking out, as it were, the processes possible on a commercial basis, and outlining their foundational principles. Owing to the already wide scope of the subject, I have found it necessary to omit one topic which really belongs under the heading, that of glazes and enamels. It is true, various colors are produced with the help of the latter, but in their discussion we would have to deal with glasses, rather than with clay, and this would lead us too far. Hence I have confined myself to the subject of coloring without the assistance of glass. Before attacking the subject permit me to drive the preliminary stakes and to answer the general question: How can architectural clay ware be colored? A natural division immediately opens up before us. As practical clayworkers it is evident to us that a clay may be colored in two ways:

First, by means of coloring materials mingled with the clay body itself, and,

Second, by means of coloring matter applied to the surface, and surface colorations produced by external influences, such as the kiln gases.

In the first case we deal with body colors, and in the second with superficial coloring.

To the first group belong clay mixtures and mixtures of clay with minerals such as manganese. In the second division we must include slips or englobes, and processes like flashing and blue smoking.

I shall discuss the topics in the order named, and will begin with clay mixtures. It seems the most natural thing to produce varying colors by mixing clays in proportions to suit, and it is. But let us see how it is done and what conditions must prevail for successful work. By a rough sort of classification we can distinguish two great classes of clays—red and light-burning ones. Now, it is quite important in this our work of coloring whether we start out with a red or a light-burning material. With the former the range of color is of necessity more limited than with the latter. For insance, in producing a rose shade, it would take quite an amount of white-burning clay to tone down a red-burning material. In the given case it would obviously be cheaper to start with a light clay. But, could we not reduce the red to a buff by some other means, say by means of adding a calcareous clay, a marl? Theoretically it is true that we can produce a buff or light green by means of such a mixture, burning it till a reaction between the iron and the lime has taken place. But the introduction of lime brings in some very unpleasant consequences, due to its sudden fluxing action, and extreme caution would have to be observed in the burning, since the points of vitrification and fusion lie so close together that reliable results could be obtained only by the use of a pyrometer. Besides, it would be of prime importance to attain a very thorough mixing of the two materials. In order to obtain a desirable color a limey clay must be burned to vitrification, since below that point the color is of a very indifferent character and the ware too porous. Thus it is easily seen that the manufacture of clay goods from the above combination is fraught with more than ordinary difficulties. Ordinarily we may well say that a red-brick clay cannot be converted into a light-burning one, but must be restricted to the production of chocolate, brown and black. It is evident that the clay to be added to the red material for producing these colors must itself burn very dark, and hence must be high in iron or manganese. Clays of this type are the bog ore and the Virginia manganiferous clays. The cost of obtaining these clays and the quantitiy required must, of course, determine the advisability of making such a mixture.

A. V. BLEININGER, Columbus, Ohio.

We now come to the white or buff-burning clays, the so-called No. 2 fire-clays so extensively used in the front-brick business. The scale of colors in using such a clay is very much greater than with a red-burning one, since to a light body any other color may be imparted, and the limit is practically determined only by the factor of cost. Most clay works using light clays are in position to avail themselves of red-burning material with which to produce the colors known to the trade as terra cotta and rose. In the first the red predominates and the white appears more in specks; in the second the color is uniform. One important point to be considered in this respect is the change in fusibility produced by such a mixture, inasmuch as the red-burning material will act as a flux, and allowance must be made in the burning for this difference. It is essential that the coloring clay be free from carbonate of iron and iron pyrites, which are liable to give rise to uneven, blotched surfaces. The iron should be in the form of the red oxide, evenly distributed throughout, or, in other words, it should be thoroughly oxidized clay.

But what can we do to produce colors and effects not obtainable by means of clay mixtures? Evidently we must resort to the use of minerals. Let us see what minerals are or could be made tributary for this purpose, considered from the commercial standpoint. First of all comes, of course, manganese, which is more than any other used by clayworkers. It is followed by chromite, lime, red oxide of iron, ochre and some of the serpentine rocks. That this list is not larger is principally due to the factor of cost, and to the fact that there are not many mineral colors which can be subjected to the heat of an ordinary buff brick kiln without decomposition. We shall now see what effects are produced by these minerals on being intermingled with clays. Manganese, as you know, is the principal color for blacks, and browns for red, as well as for buff brick. The shape it is in and the manner of grinding and mixing will determine the character of the coloring. In the form of grains it will produce the well-known speckles and blotches; as pulp and when ground together with the clay it gives rise to uniform coloring. Likewise the method of manufacture, whether by the plastic or the dry-press process, influences the effect very greatly. The more uniform coloring is produced by the dry-press method, since the dry clay admits of a more intimate and reliable mixture than when in the plastic condition, where uniformity of mixture can be attained only by very thorough and careful tempering and pugging. However, by effecting the mixture of clay and manganese when the first is in the pulverized condition, before pugging, this difficulty may be overcome. Of course, the ideal method would be that of washing, in which the coloring matter is floated and most intimately mingled with the clay. Also, the manganese seems to show a more decisive, a more powerful color, so to speak, in the dry-pressed brick than in the plastic, in which it produces a more or less "washy" effect. If manganese is to be added to the wet clay, it is best made up into a slip. Since manganese is a powerful flux, allowance must be made for its fluxing effect, and the burning be done at a lower temperature. One fact which ought to be considered is the comparative purity of the manganese. If the ore is naturally mingled with clayey impurities, lime and magnesit, it will form a readily melting compound, and when thus introduced into a clay in the shape of grains the blotches formed will have a greater tendency to "run" and to stick to the brick than when supplied in the form of a comparatively pure, washed manganese dioxide. I have knowledge of a case where this has caused considerable annoyance and loss. The firm, having changed dealers, was supplied with an inferior ore, which, though nominally cheaper, was the more expensive by far in the end. The quantity of manganese, of course, varies according to the color of the clay, the method of making and the quality of the ore, the amount for gray brick varying from 1 to 3 per cent.

W. H. Fish, Columbus, Ohio.

Chromic iron ore, as far as known to myself, is not used as a body color at present, but its use does not seem impractical. The ores under this head are composed of the oxides of chromium and iron, together with silica, alumina, lime and magnesia. In appearance it is brownish black, quite hard, and has a specific gravity between 4.3 and 4.5. Chromite is always associated with the serpentine rocks, of which great areas are found in Southeastern Pennsylvania and in the adjacent parts of Delaware and Maryland. Chromite has also been announced from several places in the South. It occurs in quite large quanities in California. In the coast range great areas of serpentine rocks furnish commercial quantities of chromite. It brings in the East from $22 to $35 per ton. Chromium, unmixed with other coloring ingredients, produces an intense green, which is not affected by high temperatures. In the chrome ores of commerce, however, the color is greatly modified by the presence of ferrous oxide, which makes it very much darker. The presence of silica, alumina, lime and magnesia does not interfere with the green, except making it paler. It seems the mineral is well worth a trial in our line of work. The chromium oxide is too expensive to be used as a body color except for high-grade tiles.

Lime may be considered as a coloring mineral, inasmuch as it influences the color of any clay to which it is added. Its characteristic property in burning has been considered under calcareous clays added to red clays. But, when combined with the average No. 2 fire-clay, the action of lime is much meeker; in fact, it may be made to play a very useful part, since in the buff clays it has not many of the other fluxes to co-operate with it. Dr. Seger tells us of floor tiles used in Berlin which were hard and of a very agreeable buff color, and contained some 23 per cent. of lime. The tiles were evidently made from a very plastic fire-clay, finely ground together with sand and a large quantity of lime. In this connection the remarkable observation was made that of mixtures of fire-clay and lime, burned at the same heat, those containing 25 per cent. of carbonate of lime showed a smaller total shrinkage than the others above and below this point.

Red oxide of iron and ochre are really only expressions for one and the same thing, or, in other words, ochre is simply a diluted form of iron oxide in which the diluent is clay. We all are sufficiently familiar with the action of iron oxide, since we meet it in every one of our clays. Suffice it to say that good results can be attained only when the mixture is made very complete by means of thorough grinding and tempering. The ordinary Venetian red, which is prepared by chemical means nearly always, is contaminated with sulphuric acid, which eventually gives rise to whitewash. Iron in the shape of hematite ore, or magnetic iron, is sometimes added to buff clays deficient in iron for the purpose of flashing. By doing this the iron spots may be produced quite evenly, since the admixture of iron is under control.

In regard to the surpentine rocks, I would like to draw your attention to them as a source of coloring substances for our industries. These rocks, being of the softest kind, are quite high in coloring oxides, namely, those of chromium, iron, and, also quite frequently, of nickel and cobalt. Often they are not productive enough for metallurgical purposes, but would be well suited for coloring clay wares. Although spread over extensive areas of the United States, the metalliferous serpentine rocks are not seriously mined at present. They occur in many places, as in Lancaster county, Pennsylvania; Saline county, Arkansas; Staten Island, New York; California, and other localities.

The commercially pure oxides of cobalt and nickel, producing blue and brown, cannot be regarded as body colors, except for very high-grade wares.

Now, the practice of mixing clays and minerals is governed by at least three factors—the cost of the clay or mineral, the method of mixing, and the cost of the latter. The importance of the factors of cost is self-evident. The mixing of the clay and the coloring material must either be done as thoroughly as possible, if uniformity of color is desired, or again it may intentionally be left incomplete. As an instance of the latter I have seen a white clay partially tempered with a reddish-burning one in a pug mill, a combination which resulted in a very fine marble-like effect. Any attempt to manufacture colored bodies without thorough preparation, without adequate machinery, will be sure to prove disastrous. Experience has shown that one pulverizor, be it dry-pan or disintegrator, is not sufficient for producing a satisfactory mingling of clay and coloring ingredients. There should be two sets of pulverizers, one to do the rough and one for the fine grinding, the coloring matter being added before the first grinding. Iron-clad rules pertaining to the weighing out of the raw materials and cleaning of machinery and bins must govern the entire process. Negligence is equivalent to loss. By means of a system of bins with paved floors every color can be kept separate, and since on emptying the bins the entire cross section of each heap of clay is being cut down, a fair average is certain to go to the second grinding.

As I have shown, the list of coloring materials available is a very meager one, owing chiefly to the factor of cost. We have seen that the oxides of chromium, cobalt and nickel are not available, owing to high cost.

But is it absolutely necessary that the entire body be colored? Is it not possible to surface the brick or tiles with a layer of the colored clays, say one-fourth inch in thickness? I do believe that it is possible to accomplish this. I believe that it is possible not only to construct a dry press die which will permit of introducing a certain amount of colored clay to be backed up by the standard clay body, but also to manufacture such clay ware free from defects on a commercial basis. They are solving much more difficult problems in the mosaic tile line to-day. It is obvious that in thus providing a layer of colored clay, amply sufficient in thickness for all the wear of a brick's lifetime, only a small portion of the coloring matter required to color a whole brick is needed, and, in consequence, purer coloring ingredients may be used. The enormous reduction in cost, made possible by this process, can be shown by a simple example. Suppose we are to give to a light-burning clay a dark-blue color. The only available oxide for this purpose is cobalt, which costs about $1.50 per pound. For a deep blue about 3 per cent. by weight of cobalt is required, but, allowing for loss, we will say 5 per cent. Assuming the size of the brick to be 2.5 inches by 4.5 by 8.5, and the weight seven pounds, we would require about .35 pound of color, and its cost would amount to 52 cents per brick. With a layer one-fourth inch in thickness, the cost would be reduced to 3 cents, and, with a thickness of one-eighth inch, to 1½ cents. Only the wealthy could afford to use brick colored throughout as a means of decoration, but, with the color surface as outlined, they would come within the reach of people with moderate means. It seems to me that this problem must be solved in the near future.

I have dealt so far with body colors, and must now proceed to superficial coloration. This may be done in two ways—first by coating the ware with a slip; second, by subjecting it to the intense action of kiln gases.

Slips or engobes are used either to cover a colored body with a white coating or a white material with a colored one. They may be applied to the green or the burned body, and hence are compounded accordingly. In applying a slip to a green body, the problem to be met consists in obtaining equal shrinkage in drying and burning, while in engobing a burned material the troubles due to shrinkage in drying may be eliminated, and only the behavior in burning need be considered. In order to illustrate the fitting of such a coating, I shall consider the most difficult problems confronting the clayworker, viz., the covering of a green colored body with a white slip, and of a burned colored body with the same coating.

Knowing the approximate burning temperature of the body, we can proceed to fix the engobe, first by virtue of the plastic bond existing between the body and the clay of the slip; second, by means of the cementing due to the vitrification of the slip. Assuming that the body is finished, say at a temperature of cone No. 2, we will take a plastic white-burning clay maturing at about cone No. 5. The first thing to be done is to adjust the shrinkage in drying by means of practical testing. Thus, if the slip shows cracking due to its greater plasticity, we can, of course, correct this fault by adding quartz sand till equilibrium is established. Again, if the slip clay is too lean, and cracking is produced by this difference, the plasticity of the engobe must be increased, which, naturally, is accomplished by the use of more plastic clay. We see that the shrinkage in drying is not a difficult matter to control. But now as to the burning. If the body and slip, which through the drying stage have behaved so harmoniously, will continue to do so, all well and good. But the chances are that some more corrections must be made. We have as yet not added any materials which produce vitrification and with it an interlocking of body and slip, for, as we know, the body matures at cone 2, which is below the proper temperature for the slip clay, to say nothing of vitrification. We are very apt to find that the slip seems too soft, and that perhaps its hold upon the body is not any too strong. Evidently we must add fluxes to the engobe, and we have for this purpose the choice of such substances as lime, barium, feldspar, lead, potash, soda and boric acid. The first four may be added as they are; the last three, being soluble in water, must be melted together with silica, some alumina and lime, to an easily melting glass, which can then be used like the single fluxes. By going to work systematically and increasng the contents of these fluxes in our mixture of clay and quartz sand we will find finally that the slip becomes hard and partially or wholly vitrified, and hence our desires are fulfilled as far as this point is concerned. If we are dealing with a self-respecting slip, no more trouble will be experienced, but we are not yet out of danger. There are two more pitfalls to be overcome. It might be that the ware showed a system of cracks of the slip, evidently due to unequal expansion, the slip expanding more than the body. Here again we have a remedy in the shape of silica (flint or quartz), which reduces the expansive tendency, so that once more we produce equilibrium between body and slip. But the cracking may take place in such a way that pieces of the edges of the ware are splintered or broken off, phenomena which will tell us that in this case the body expands and contracts more than the slip. This is evidently the reverse, and the remedy also is the reverse, namely, reduction of the quartz sand or flint in the slip, or in crease of fluxes, which will cause the slip to expand more and equal to the body. These simple rules will enable us to control the behavior of the slip in every respect, so that a systematic course of procedure will leave us masters of the situation.

The second way, that of slipping the same colored but burned body with a white slip, is much simpler than the first, since we need not pay any attention to the shrinkage of the body in drying, and we can make the engobe as plastic as we like. But in this case we must be sure to have at least partial vitrification take place, in order to obtain a firm bond between body and slip, for here we have no plastic bond to depend upon, since the body is in the burnt condition when the engobe is applied, and we must rely almost entirely upon the molecular adhesion and the cementing process due to incipient or complete vitrification. Yet there is no difference in the procedure of trying for a vitrified slip and correcting the cracking produced by differences in expansion, so that we may proceed as in the case of the first slips.

For terra cotta the slips usually are of such a nature that they are completely vitrified when the body has reached its proper strength, although in most cases the basis of the engobe is the clay from which the terra cotta is made, simply rendered more fusible. In the evolution of slips great help may be derived from reference to the composition of the Seger cones. For instance, knowing that a certain clay requires a certain heat of, say cone No. 6, for its best strength, and desiring to obtain a slip which must be vitrified,, we can make up a slip approaching as near as possible the composition of cone No. 4, which represents a lower temperature, and the problem is solved. Of course, this requires a knowledge of chemical calculation, but the matter is not difficult, and puts the desired object under perfect control.

Since architects urge impervious surfaces, the matter of vitrified slips is not beyond the scope of pressed-brick manufacturers. It should be borne in mind that a vitreous surface thus produced is as much an ornamental feature as a glaze or enamel, it being, in addition, free from the disadvantage of the latter—the cold, glassy appearance. It is evident that by means of slips almost any color may be produced. Yet there are some things to be avoided. For instance, the application of white slips to red-burning bodies is not advisable, since the contrast between the two is too great, and the chipping of corners will result in a very disagreeable effect. The slip should be made up as much as possible from the body clay, and the contrast should not be allowed to be too radical. A word as to the mechanical part of the preparation and application of slips. Since intimate grinding is a a prime necessity, the ingredients are best ground in a ball mill. According to the nature of the ware, the engobe is applied either by means of dipping, pouring or the compressed-air sprayer.

Although much could be said on this subject, I must now go over to the second division of superficial coloring, resulting from the influence of fire gases, of which especially two methods are in use—fire flashing and blue smoking. Since iron is the coloring agent of clays, and since its color is affected by oxidizing and reducing gases, it is evident that when one or the other of the two gases predominates, the color of the ware must also be changed in one or the other direction. By oxidizing kiln gases, we understand that there is present an excess of air, or, what is equivalent to this, an excess of oxygen. Examples of this action are shown in every kiln of the land. Iron oxide being capable of existing in two forms, one of a red, the other of a black color, is governed by the presence of either of the kiln gases. The red oxide has more oxygen than the black one, and hence oxydizing kiln gases tend to keep the iron in the red condition, while reducing gases, hard up for oxygen, can afford to keep only the black oxide. Now, in flashing we simply make use of this fact. We produce reducing conditions by choking the draft and firing very heavily. Air soon is a scarce article and the iron oxide, in whatever shape it may be in, is reduced to the black form. Hence, every clay having iron can be flashed, but the looks of the flashed ware may differ very widely. If the clay is a red-burning one, with the iron evenly disseminated, flashing will change it to a black; if it burns pink, it will become dark red; if it burns white, but has small particles of iron in it, these will show at the surface either as black or brown blotches. The appearance of flashed ware depends upon many factors, such as the quantity of iron present, its shape, how distributed, the amount of other fluxes present, the temperature of burning, the intensity of reduction, and the time of reducing, and finally the rate of cooling. Most of our flashed brick are No. 2 fire-clays, having the iron present in two forms; the greatest part appears as grains of iron sulphide, and a small portion exists as an evenly-distributed iron oxide. In the reducing process the iron grains are reduced partly to the black oxide, partly to the metallic state. This may be shown by pulling a piece of flashed brick from the kiln when it is just finished. The body will be found to be of a grayish white color, while the black spots show off prominently. Now, if we wait several hours and then again pull a piece, it will be found to have a reddish tinge. If we keep on drawing trial pieces the reddish color will appear more and more, until after about eighteen hours we can perceive no further changes. Evidently the reddish coloration is due to oxidation by the air in the cooling kiln, for a white hot piece drawn from a kiln just finished will not change its appearance at all, however long exposed to the open air. But we by no means know all about the phenomena of flashing. Its control at present it limited to the regulation of flashing or reducing period of firing, the temperature and rate of cooling. We obtain similar results only by proceeding similarly in each burn, reducing the same length of time at the same temperature, and letting the first part of the cooling proceed at the same rate.

Blue smoking is simply another case of intense reduction where, in addition, hydrocarbons, tar, refuse oil, are allowed to decompose in the kiln, resulting in the deposition of graphitic carbon in the pores of the ware. In appearance the best type of such ware has a blue-grayish metallic lustre, and forms a well-paid staple article in the building markets of Europe. The process is not practiced in the United States as far as known to me.

J. C. ADAMS, Indianapolis, Ind.

This outline of the means of coloring clay ware is but a crude attempt, but I trust that it may have defined the field to some extent, and that possibly it may lead to the more accurate investigation of its many interesting phases by other members of the Association. (Loud applause.)

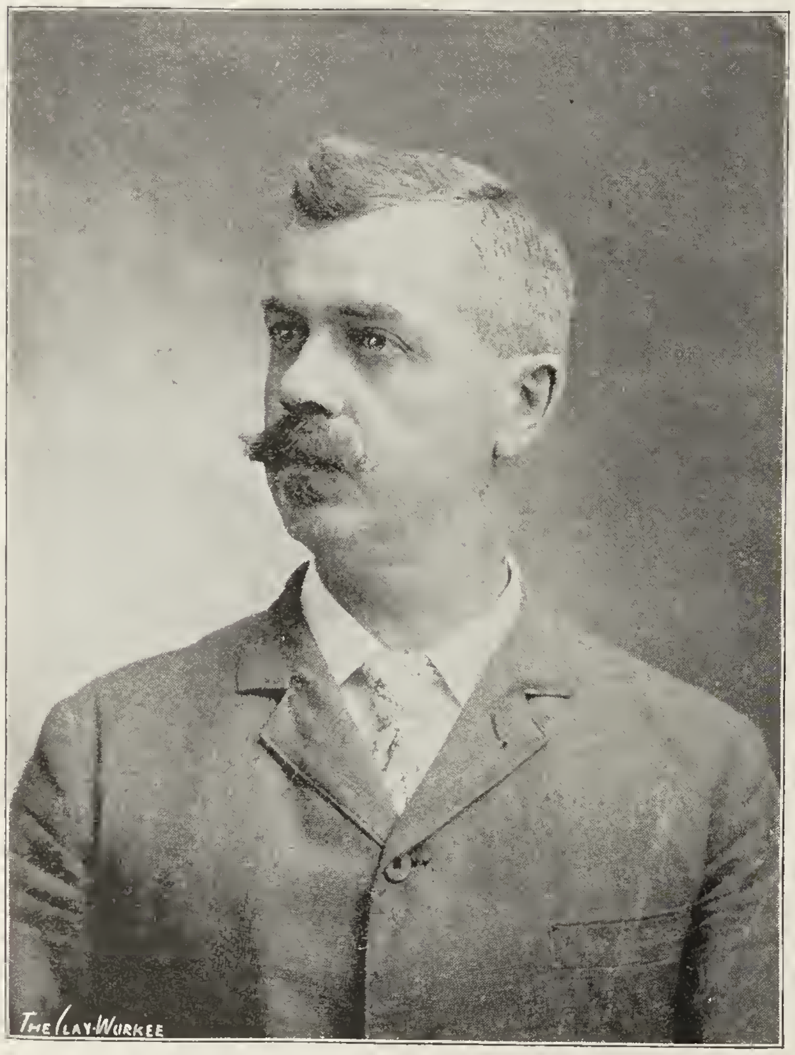
President Richardson: The paper is open for discussion. There is a great deal in the paper of interest to those present and the manufacturers of pressed brick. The manufacturers of face brick are deeply interested in the subject introduced in this paper. I for one am going to read it very carefully when published. I am sure those who have had experience in this matter will appreciate Mr. Bleininger's paper.

Mr. Plumridge: Following up the President's remarks to the effect that pressed brick manufacturers are especially interested in this paper, it is just such papers as this that I alluded to this morning, extracts of which should be published and given to architects. Of course, they don't want scientific mingling of colors, but I think architects ought to be educated as to the difficulties of producing colors. We ought to try to educate the architects up to that point and impress on them how difficult it is to carry color effects, so that they may appreciate it more and we will get more for our brick.

—Fire Flashed Pressed Brick.—

President Richardson: I am going to take the liberty of calling on some of the gentlemen present. I will first call on Mr. Lovejoy.

Mr. Lovejoy: I would like to read that paper, and I will, of course, when it is published in the Clay-Worker, but I should like to read it before I say anything on it. It has been a revelation to me, notwithstanding the fact that for twelve years or more I have been working that kind of colored brick, trying to get the fancy colors and fads. Mr. Bleininger's paper opens up a field so broad that up to this time I had never even considered the possibilities of colors. That one thing of coloring solid brick is a beautiful thing, getting colors on the extreme superficial face of the brick, such as flashing. I remember at the Philadelphia Convention the statement was made that the use of fire flashed brick was only a fad that would soon pass away. I was at that Convention as the representative of a company that was making buff brick exclusively, and while it was my first Convention I hadn't the courage to say to the Convention what I thought, but I thought then that the architects would no more return to the red brick and brown of the stone than the painters who produce the beautiful pictures that adorn our walls would return to the original colors which the Aborigines use in putting on their war paint. Our cities will no more be built of one color than our pictures will be made of one color. The very advancement of buff brick and all the various colors that have come forth have made the most beautiful cities of the world. Our cities are no longer composed of common place structures; they are works of art. I am unable to discuss Mr. Bleininger's paper. I could not possibly add anything to it, and I am certainly not in a position to say anything against any of the things he has brought forth. I believe it is one of the most valuable papers we have had before this Association. It is just such a paper as we would expect from one of Prof. Orton's pupils, and only one of such papers as we will probably get from some of his pupils in the future. It is going to do great things for this organization; it is going to put us on a higher level. We are going to take up these papers and study them, perhaps not from a chemical or scientific standpoint, but we will study them for the effect they will have on our business, and we will look into these things a great deal more closely in the future, and we will come to future conventions prepared to say at least a little on these questions, at least with reference to their effect on our business.



Ellis Lovejoy, Union Furnace, Ohio.

In this connection I want to say just a word coming from my experience in regard to the effect of firing on color and its results. Twelve years or more ago, when the paving brick business was in its infancy, in this part of the State at least, the company I represented conceived the idea of making paving brick, and by the dry press process. We filled a kiln—it was an old-fashioned common clamp kiln, and we burned it and tried our best to get them to burn to vitrifaction. I remember we fired that kiln for ten days with coal, and the amount of coal we did roll into it was astonishing. I think we drew the most of it out of the top. We used a No. 2 buff clay, containing about 1 6-10 per cent. iron. It burned quite a light buff. In fact, there are so-called buff brick on the market that are not in it with them, but I do not know of any of them that are much lighter than they were. The clay used was a No. 2 fire clay that burns a light buff. After this firing our kiln was closed and cooled as slowly as we could. When we opened that kiln instead of buff brick we had a pink brick, or rather a more of a light chocolate or brown, but compared with the buff brick it was very dark, and it was a revelation, a surprise; there was the very color we wanted in our buff brick. We took a number out of the kiln and sent out a few of tnem to our agents, and they came back at us right away: "How did you get them; it is just what we want; we will order all you can make." Well, we could not make them, as least we thought then we could not. At that time the question of mixing clays—I do not know how it was in other parts of the country—but with us and those with whom we were acquainted it was thought that clays could not be mixed successfully. The difference in the shrinkage of the different kind of clays, except in rare instances, would give you weak brick, and it would be impossible to go into any extensive mixing of clays in order to produce color. But, by the way of experiment, we did just that thing. We mixed a red clay with our buff clay and fired it, and we got a color very close to that accidental color, but to get it we had to add somewhere in the neighborhood of 50 per cent. of the red clay, which contained between 5 and 6 per cent. of iron. In other words, we had to add nearly 3 per cent. of iron to our buff clay to produce that which we got in the first place without it. That question came up, and we have never solved it. Did the first brick in any way absorb coloring matter from the coal? This is a question that the infant Association discussed at some length the other evening, but in that discussion I did not take any part, but I have always felt that those brick did in some way get this coloring matter from that long continued firing with coal. It led to our adopting a mixture of two clays, and since then the mixing of clays has gone on until there is no end, and Mr. Bleininger's paper opens up a field so broad that the horizon beyond is invisible.

Mr. Bloomfield: I think I can help that gentleman out. There is a building in New York City built of brick and terra cotta of the same color Mr. Lovejoy describes. They were made by the New York Architectural Terra Cotta Company, under the direction of James Taylor. That mixture was made of red terra cotta containing about 6 per cent. of oxide of iron and a No. 2 fire clay containing a very small amount of free silica, being what we call in New York fine fire clay. It was not burned with coal, but with oil, and the color was obtained by the mixing of these clays, not from any effect of the fire or coal.

President Richardson: There are other face brick manufacturers here who should have something to say. I would call on Mr. J. Parker Fiske, of Boston.

Mr. J. Parker Fiske: I am suffering from such a cold that it would be impossible for me to say more than a word on this subject. But it is a subject that appeals to me so strongly, and I am so much interested that I want to add just a word. Our experience in producing colors consist in mixing clay and also in flashing, and as Mr. Bleininger has said, it is perfectly possible to get colors by mixing clays, and it is possible to get other colors merely in the burning. I want to speak merely of one particular subject, and that is the flashing. I did not know what Mr. Bleininger's paper would be; I did not know he would bring it out so forcibly, or I would have kept here in this room some examples of flashing I had here last night to show the Ceramic Society. I have here (holding to view a gold colored brick) a brick called an old gold—not a gold brick, because we do not handle those (laughter), but a gold brick made up of three or four materials, each one of which is an important factor in producing that particular color, and if we vary it we get a bright gold, and by adding another one to it we shall get another shade. We were obliged to abandon about six months ago a certain kind of gold because we could no longer obtain a certain clay, and it took us several months to find a substitute for it. We get our clays in New Jersey, and they are sent by vessel to Boston. Having got the proper mixture of clay, we put them in a down-draft kiln and burn with coal. As many brickmakers know, we do not always get the same color, and we often get colors that we do not want, and often get colors which we do want, and that comes, as we have pretty clearly demonstrated, in the flashing and not entirely in the burning. We use Seger cones, obtained from Prof. Orton, and we have found them of great value in determining the heat of our kilns, but with a given heat we do not always get the same color. I am afraid it is too true that the brickmaker puts his brick into the kiln and burns his brick as nearly as possible to the required temperature, and then if he does not get the required results he is sure to say that kiln had a break, and end the matter there. It is possible, and I believe that brickmakers will come to it to determine exactly what causes these irregularities and so regulate their burning and cooling as to get the same results every time. I think such papers as we have just heard are a great help and a great stimulus to push forward to that condition.

—Experiments in Burning.—

Mr. Evatts and I have been conducting a series of experiments to determine at what stage of the burning that color is produced. Our first experiment consisted of taking out samples at intervals of fifteen minutes after the coal was put on. We took them out at the even hour, at fifteen minutes, at thirty and at forty-five minutes, and to our surprise we got no difference in the color practically. Then we tried another experiment. After the kiln had been heated to the proper temperature, up to the proper cone, we closed the doors tight and let the fires die out, leaving the damper in the stack open and letting the air through the dying fire and afterward through the fire box. Then we took out samples at intervals of two hours. We found the first samples gray, the next began to have a little bit of a tinge of yellow, and so on. As we drew out samples at intervals of two hours we found they became more and more flashed, until at twelve and a half hours there seemed to be no further oxidation, and no further increase in the yellow color. It seems to show us that out of the conditions arising that these colors, or final colors, are produced entirely in the stage of cooling. It is not possible to get the brick to the right color unless you get the brick up to the right temperature, and having got it there, you get the oxidation in the process of cooling, which finally gives us that color. We get this with other clays and different colors, of course, but the same general scheme of producing the color or colors coming in the process of the cooling. This seems to eliminate the theory first proposed that this color is produced by the smoke or deposited from the fire. Of course, in one sense of the word, it is a deposit from the fire—a deposit of oxygen—but in the ordinary sense of the word it is not anything like that. Some people say it is, but I say not. This shows us as brickmakers one important thing. The mode of cooling will govern the color of your kiln. and I believe this is one reason why the brickmakers have had trouble in getting the proper color, they cool off their kiln too rapidly. If we cool off too quickly we get a bright color, a color of no depth. If we cool off too slowly, we get too dark a color. This part of the brick I hold to the light is not flashed, the brick being set on the flat.

Mr. Plumridge: Do you find a difference whether you weather your clay?

Mr. Fiske: No, sir, there is absolutely no difference. As I said, we ship our clay, and the clay we make these brick out of is very tough. We had a schooner of clay lost in Boston harbor, and the clay sunk. After it had remained in the water some time a wrecking company raised the schooner and we bought the clay from them at a very low price, and we found the clay as good as ever. Its briny bath had not injured it in the least.

Mr. Ittner: I would like to ask a few questions. What quantity of brick do you have in your kiln, how high do you set them, and how nearly all the brick in the kiln are of that shade or color? In other words, do the brick differ in different parts of the kiln?

Mr. Fiske: We have quite a variety of kilns. We have the old square Newcastle kiln, with the fire in the end. We also have some strictly modern kilns. It makes no particular difference which kiln we burn in, or exactly how high we set the brick, but these brick are not set very near the fire; they are set in the coolest part of the kiln.

Mr. Plumridge: There is a gentleman here who can give us something interesting, Mr. J. W. Wolfley, but he is a little bit bashful. I was going to speak of something about this difference in the color being produced by the manner the brick are set on the dry car as they pass through the dryer. Mr. Wolfley knows about that, and I would like to hear from him.

Mr. J. W. Wolfley: The firm I was with in St. Louis is the same firm with which Mr. Plumridge is connected. They had a little trouble, if I remember correctly, with their brick in handling them on the dryer cars. They tried several different ways of setting, and they finally adopted the method of setting the brick flatway on the car. Whether that had any effect on the color of the surface I did not pay close enough attention to say sure. The majority of the clay they used was weathered clay. They had a large pile of it right across the road from the factory, and on the days they were running on building brick they would screen that clay and use it. We always thought in our ignorance that it was our weathered clay that gave the pinkish cast to the brick. While my service with the company was devoted almost entirely to the terra cotta end of the business, yet I paid some little attention to the brick, and I must confess I was not of the same opinion as Mr. Plumridge. I always thought that this pinkish color was caused by the weathering of the clay, but since I have listened to this paper and the talks following on flashing, and heard conversations in the lobby of the hotel and talked with the different brickmakers, I have come to the conclusion that the clay that Evens & Howard used in making their brick would all come to this color. I do not exactly remember the percentage of iron in their clay. They have nodular iron, what we call pyrites. In some parts of their clay it is quite thick, and in other parts it is very scarce. As the clay from which they made their building brick was all weathered I do not believe the nodular iron was unevenly distributed. I do not know what more I can say. I do not see how the manner of setting the brick on the cars could have had any effect on the color—whether it did or not I do not know. I think the main trouble they had was in the brick cracking, and they would get out of shape, and I think after they adopted this other method they preserved their straight lines, if I remember correctly. I may be wrong, but I know the last two or three orders of brick they had came out as pretty as any that could be turned out, and they were all good color.

J. Parker Fiske, Boston, Mass.

W. H. Hoagland: I think it would be a good idea for the pressed brick manufacturers to make arrangements with Prof. Orton, if such an arrangement could be made, that would place us at liberty to send our material to him, our raw material, to be analyzed and thoroughly tested and receive suggestions from him and his school as to what could be done with our clay. In sending this clay give him a report of what we had accomplished, and after he had made his suggestions and we had made our tests and trials we would be at liberty to correspond back and forth. I believe we could afford to support an information bureau along this line.

Mr. G. S. Ettla: This Association has been paying for some very valuable tests along the matter of paving brick, and I think the dry pressed brick men could not do better than arrange to have these tests made for themselves. I think it would be money very well spent instead of paying for these experiments in our own individual factories. If we could get together and secure some one to make these tests for us.

President Richardson: I think that point is very well taken, but the amount of work that can be done by the school is limited, and the character of the work is determined by the members of this Association. If the members so vote the work can be done.

Mr. Purington: I have not seen Prof. Orton, so I ask the question in a general way. Would it not be practicable for the dry pressed brick manufacturers to make arrangements outside of the Association to have this work done?

Mr. Hoagland: That is my idea exactly. Have the dry pressed brick manufacturers pay the expense. I would gladly pay to get this information on my clay alone if I cannot get it in any other way.

Mr. Gates: I hope the pressed brickmakers will do this, and I will pay some of the expense myself. I have enough worry over you gentlemen. I believe in following these things up, and getting information and paying for it. I had not intended to say anything until we went into executive session on flashings. I had my eye on that specimen. You gentlemen missed it by not being in the Ceramic Association last night. I made a speech myself. (Laughter.) I am sorry you should have missed it. I told those men last night that they never realized, and you never have, what made terra cotta men look old. For a good many years you dry press men have been experimenting not intentionally, you have been getting freaks out of your kilns, and every time you get an odd looking brick your agent gets hold of it, and the owner gets it, and then the architect gets it, and then I get it—in the neck. (Laughter.) I have to match these brick, and I have been working days and worrying nights over them for years. I think Mr. Hoagland is right in line. I think we have reached a point where we can afford to pay for results. I think it is better to pay a little money out for scientific experiments than it is to fool away a lot of money and grow gray and baldheaded in wrestling with the work as it comes from the kiln.

W. N. Durbin, Anderson, Ind. The sweet voiced Tenor of the V. Q.

Mr. Fiske: I, too, like Mr. Gates, am sorry you did not see those specimens I had last night. I gave them to Prof. Orton to take out to the college, and I will arrange with the professor to have them where you can see them to-morrow.

President Richardson: If there is no further discussion on this matter we will take up the regular order of the programme.

Mr. Eudaly: One word before we pass this paper. I am quite well acquainted with some of the people connected with the Rookwood Pottery Company, and they undoubtedly know a great deal about coloring clays and the burning of them, and I am told that the highest priced pieces of ware that they have or ever produce are accidents. Not long ago I was there, and they showed me a very fine piece of ware which was partly an accident. It did not come out of the kiln at all as they expected, and they said they had spent hundreds of dollars trying to imitate it, but had not been able to, but they had several pieces of ware ready to set in the kiln that they hoped would be able to imitate it. These people don't do things by guess; they do everything by formula; they know what they are doing, and they know exactly what clay was mixed to produce that color, but in their attempt to reproduce this particular ware they had made a number of other pieces not at all like it.

President Richardson: Unfortunately, Prof. Orton is not here. It seems to me this is quite a difficult subject, for the reason that every manufacturer has a different clay to work, and has got to produce brick for his market, and to a great extent it would have to be an individual matter with him, and he could make arrangements with Prof. Orton to have his clay tested and pay for his own work. Two clays could not be subjected to the same tests.

Mr. Bloomfield: My business brings me to a certain extent in contact with the manufacturers of glass. I have been in a great many glass factories, not only where they make common window glass, but the beautiful colored glass. I think the same thing is true with clays as with glass. In these beautiful shades a certain amount of color is put in that mixture, and as the mass is taken out by the man who manipulates it he moves it back and forth over the heat, and the shading is caused entirely by the degree of heat that it is subjected to. I believe that these freaks in terra cotta and brick are to a great extent due to the amount of heat that is put upon the material. That is my observation of over twenty years' experience. I first began in this work by furnishing clay for architectural terra cotta twenty years ago, and have been intimately connected with that line ever since, and have been deeply interested in it. One of the greatest pleasures of my life has been to notice the beautiful things produced out of clay. I think to-day I can say that the degree of color is produced almost entirely by the heat.

President Richardson: The Secretary will read the next order of business.

Secretary Randall: The next number on the programme is a paper on "Profit and Loss in Brickmaking," by John Miller, Washington, D. C. Mr. Miller is detained at home, as is explained in the following letter:

T. A. Randall, Esq., Secretary N. B. M. A.:

Dear Sir—Inclosed please find my check for $2 for dues for 1899. I had intended to be at the Convention this year sure, but owing to my being a little under the weather this week I am afraid I will not be able to attend this year's Convention. I don't know whether it is the la grippe that has got hold of me or not, but something is the matter. If I am better by Monday night you will see me on Tuesday at Columbus. Give my kindest regards to all brother brickmakers if I don't arrive on time. Hoping you will have a good Convention, I am, yours truly,

Washington, D. C., Feb. 5, 1899. JOHN MILLER.

Secretary Randall: This brings us to the questions for general discussion. The first question, No. 30, is "What Effect Does the Washing of Clay Have (1) Upon Its Physical Qualities (2) Upon Its Chemical Composition?"

Mr. D. V. Purington: I do not think that there is any question but that the washing of clay amalgamates and mixes and makes it thoroughly as homogeneous as possible to make clay, and does it better than any other process, and the second depends upon what you take out.

President Richardson: I would like to hear from Mr. Bleininger on this question.

Mr. Bleininger: I am not at all prepared upon this subject as I should be in order to answer this question properly.

Secretary Randall: The next question is along the same general line, "Does It Pay to Wash Clay for Brick and Terra Cotta, and What Does Washing Cost?"

President Richardson: I have been requested to ask Mr. Lehmann to speak on this question.

Mr. Lehmann: The price for washing clay for Chicago brick varies from 43 cents to 18 cents a ton. When I say that the difference in percentage to wash the clay is about from 60 to 100 per cent., or a difference of 40 per cent., on account of the different kinds of clays. For instance, I have to give the clays from Milwaukee a washing about 30 per cent. more than the Chicago clays, and about the same time I can wash another kind of clay for less than 30 per cent. These figures are the cost from the clay bank through the washing machine to the settling tank to the dryer.

Secretary Randall: The next is question No. 32. "What Is the Effect of Weathering Clay Upon the Efflorescence of Brick?"

Mr. Purington: Give it up.

President Richardson at this point called Vice President Hoagland to the chair and spoke from the floor.

President Richardson: I think it has been generally considered, if weathered properly, the way it is done in some places will prevent efflorescence on brick, but with some it is a question whether it is not more of a detriment than otherwise. That is to say, efflorescence is produced by the decomposition of iron or other matter in the clay. Sometimes this is helped along by weathering it or washing it entirely away, so that your clay, when made into brick, will not show the efflorescence. But, if only partly weathered, you have partly decomposed it, so that your clay is in worse condition than if not weathered at all.

—What Is the Effect of Weathering Clay Upon the Efflorescence of Brick?—

Mr. Purdy: During my course of reading this winter it was my pleasure to read an article on "Saline Efflorescence of Bricks," by Dr. Gerlack. He confirmed the now accepted theory that the cause of efflorescence can be traced back to the iron pyrites found in nearly all clays, or to the sulphur found in the fuel used in burning.

This iron pyrites, or iron sulphide, is widely distributed in clays of all geological ages but occurs more commonly in the older deposits, such as fire clay and shale. In surface clays it is not so common, and, in fact, almost rare.

By weathering this iron pyrites is converted by an unknown reaction to the sulphate of iron, having sulphuric acid as a biproduct. Iron sulphate is soluble in water, but when brought into solution in the presence of alkalies or the alkaline earths they break up by neutral decomposition, forming the carbonate of iron and the sulphates of lime, magnesium and those of the alkalies.

In shales, and particularly the blue shales, iron pyrites is scattered throughout its mass in lumps of varied sizes. By exposure of the face of the shale bank the iron pyrites is oxidized by the action of the atmosphere, and when brought into solution by rains it comes into contact with the compounds of lime and the alkalies, forming the soluble sulphates as stated before. These soluble sulphates must be washed out by a system of weathering that will permit perfect percolation and drainage, or efflorescence will ensue. If such a system of weathering cannot be used it would be far better to work the shale direct from the bank, thus not allowing the formation of any more soluble sulphates than existed in the clay at the bank.

In the case of a fire clay which is mined the iron pyrites has not had an opportunity to oxidize, and must be either worked direct or weathered well if efflorescing is to be avoided. Yet if the clay is used direct from the mine, and made up into bricks, the amount of efflorescing salts in the burned brick will be increased during the burning from five to twenty-five fold, depending upon the amount of sulphur in the coal.

Where the clay is brought to the factory and dumped into large conical piles there is generally but little chance for the washing out of these salts. The bulk of the pile and its shape are unfavorable to permeation of water, and proper drainage is usually unprovided, and at the most would only wash the soluble salts to the bottom of the pile, thus causing local efflorescence in the bricks.

In the "rack and bin" system the clay is piled into a bin similar either to a corn crib with slated floors and sides, or to a coal bin, with an open top, standing off of the ground. Here is provided perfect drainage for all percolating water, giving full opportunity for the soluble salts present or formed in the clay by weathering full opportunity to be washed out.

The "floor" system is used in dry press brick plants which use hard, rocky material, but which for any reason cannot store a great quantity of clay in stock piles. The clay is ground, steamed and piled upon the floor in strata of three or four feet of thickness. The efficiency of this system to remove the soluble salts is very poor unless there is provided good facilities for drainage and the clay wet down artificially.

Of course, the presence of iron pyrites alone will not cause efflorescence. There must exist also lime or some of the alkaline compounds. Suppose your clay is free from pyrites but contains lime salts, and the fuel you use in burning contains sulphur; there will be a forty fold increase in the amount of efflorescing sulphates in the burnt product, but if your clay is free from lime and contains sulphur alone no efflorescence will ensue.

Lime in such compounds as can be attacked by sulphurous acid occurs in clays to the largest extent as calcium carbonate, and therefore cannot be washed out. In this case, if the clay is free from pyrites, weathering will not have any effect on the efflorescence, and whether the clay, when burned, will effloresce depends wholly upon the purity of the fuel used.

Mr. J. W. Wolfley: In regard to this weathering of clay, we accidentally did a little experimental work on it last summer. The superintendent of the factory and myself were out in the stock shed one day, and he picked up a brick, and said, "That's a pretty good-looking brick. I guess I'll take into the office." It was a good, hard-burned brick, and he carried it into the office, and he put it on the window sill with another brick. The water tank was sitting close to the window, and he took a drink, and the remainder of the water in the glass he poured part on one brick and part on the other, and he turned to us and said, "Whenever you take a drink, pour the balance of the water on the brick," and we did so for a week. The fire brick made by these people are made from the clay as it comes direct from the mine. It is hauled to the factory in wagons and dumped up at the end of the brick shed, where the wet pans are. The building brick clay is all weathered, and, instead of putting it in a conical pile, it is put in a big, flat pile, and they begin at the top to use it. The building brick, being soaked in this way about a week and the fire brick being treated practically the same, the building brick showed no efflorescence at all, while the fire brick had a faint greenish tinge at the top, where the water had been poured. On the other four sides I did not notice anything, so I think the weathering of the clay is very important, especially in doing away with this efflorescence.

Mr. Fiske: Was this the same clay?

Mr. Wolfley: Yes, practically the same clay from the same mine.

Secretary Randall: Question No. 33 reads, "Does it pay to weather clay?"

Mr. Bloomfield: I can get fifty cents a ton for weathering clay, over and above the green clay.

Ross C. Purdy, N. B. M. A. Scholarship Appointee 1899, Buffalo, N. Y.

Secretary Randall: The next and last question, No. 34, "Can thorough pugging take the place of weathering?"

Mr. Pike: No.

Mr. G. S. Ettla: Thorough pugging will not take the place of weathering clay when you want a quantity. I have listened with a great deal of interest to what has been said in regard to discoloration. My experience is that a vitrified brick will not discolor, whether made from clay that has been weathered or clay not weathered.

Vice President Hoagland: This is the last of the questions, and brings us to the report of committees, and I would suggest that we first hear from the Committee on Revision of Constitution and By-Laws of which Mr. C. A. Bloomfield is chairman.

Mr. Bloomfield:

REPORT OF COMMITTEE ON REVISION OF THE CONSTITUTION.

Gentlemen of the Convention:

According to a resolution adopted at the Convention held in Pittsburg, a committee of three was appointed, consisting of Charles A. Bloomfield, chairman; George M. Fiske, of Boston, and C. H. Classen, of Baltimore, to recommend to this Convention such changes in the constitution as may seem best to the Association. The undersigned, therefore, after mature deliberation, recommend the following:

That Section 1 of Article IV shall be changed by inserting for the word "two" the word "three," so that it shall read "and three dollars thereafter."

2. That Section 1, Article VI, shall have added to it these words, "but no person shall be eligible to the presidency of this Association who has not attended a previous Convention."

Respectfully submitted.

Committee.
CHARLES A. BLOOMFIELD, Chairman.
GEORGE M. FISKE.
CHARLES H. CLASSEN.

Mr. Purington: I move that the first section of the report of this committee be adopted

Mr. Eggers: Second the motion.

Mr. Bloomfield: I want to speak to the resolution. At the last meeting one of our brothers suggested that something be done to limit the production of brick, and Mr. James Taylor arose and made this remark: "It is not fair to ask one of our brothers to do something that we would not be willing to do ourselves, namely, to limit our production. We should do something to increase the demand for our brick." To do this it is necessary to put before architects and builders some of the advantages of clay ware as a building material. We have got to be able to give them statistics showing that the first cost of the building is saved in the repairs and insurance, etc. We want to show them that building of brick or terra cotta or a home of this material is as cheap, if not cheaper, than a frame building. We have got to have money to do all this. Meantime the situation is before you. If you want to do these things you have got to give the parties having it in charge sufficient funds to work with along this line to increase the consumption of brick and benefit you all.

J. W. Carson, Chairman Committee on Resolutions, LaPrairie, Ont.

Mr. Purington's motion was then put and carried.

Mr. Eudaly: I move the adoption of the second section.

Seconded by Mr. Adams and carried.

Mr. Eisenhart: I move the adoption of the resolutions as a whole.

Motion seconded by Mr Harris and carried.

Mr. Bloomfield: If you will extend a little courtesy to me, I would like to say a few words. Sometimes even a kind word or an act of courtesy changes a whole life. We have had from the commencement of this Association but one Secretary. It is not necessary for me to say what we think of him. At every Convention that I have attended I have seen with him a sweet little girl, who, as she grows to womanhood, is, year after year, growing in our affections. We all admire and love her, and I am going to offer a resolution that this young lady, Miss Edna Randall, be made the daughter of this Association and an honorary member for life. (Applause.)

Mr. Eggers: I heartily second the motion. (Applause.)

Motion carried unanimously. (Cries of "Speech.")

Secretary Randall: This is very, very thoughtful and kind of you, gentlemen, and I know Miss Edna will appreciate it. I am really sorry she is not in the room now to thank you herself. This brings us to the one other committee, the report of the Committee on Resolutions, of which Mr. Carson is Chairman.

REPORT OF COMMITTEE ON RESOLUTIONS.

Mr. President and Gentlemen of the Convention:

Your Committee on Resolutions desires to submit the following as their report: It is with deep sorrow that we record the death of a number of our most faithful members. Since our last Convention five of those who have for years been identified with this Association have had their names transferred from our books as active members to that ever-increasing roll of the great and silent majority. This includes the names of our beloved brothers,

R. M. Booker, Hampton, Va.
John McCain, Denver, Col.
William Waplington, Philadelphia.
Hector McLean, Bridgeport, N. S.
James Taylor, Port Monmouth, N. J.

We extend our condolences to their respective families and the communities in which they resided, and recommend that this brief testimonial be spread upon the minutes of our Association as a slight token of our love and esteem and in memory of their sterling virtues, and that a copy of same be mailed to the families of the deceased.

—Standard Size of Brick.—

Your committee also recommends the adoption of the following resolutions:

Resolved, That this Association desires to emphasize the position taken by it ten years ago in regard to the desirability of a uniform size of pressed and common brick.

Resolved, That it is the sense of the brick manufacturers of the United States, in Convention assembled, that the size of brick previously recommended be heartily indorsed by this Convention, and its members earnestly urged to continue their efforts to accomplish the desired results. The size referred to is for common brick 8¼ by 4 by 2¼ inches, and for pressed brick 8⅜ by 4 by 2⅜ inches, and would further suggest the adoption by this Association of a standard size of Roman brick of 12 by 4 by 1½ inches, and for a Norman brick 12 by 4 by 2⅜ inches.

—A Memorial to Congress.—

Be it resolved, That, whereas it has come to the knowledge of some of the members of this Association that there is pending before Congress a proposition to establish a Division of Mines and Mining in the United States Geological Survey, with a sufficient appropriation to carry out the wishes of the director of the survey, to make among other investigations a study of the clay deposits and clayworking industries of the United States; therefore, be it

Resolved, That it is the sense of the National Brick Manufacturers' Association, in Convention assembled, that the enactment of the proposed legislation would be to the interest of the clayworking industries, and that the members of this Association are hereby urged to use their best efforts with their Senators and Representatives in Congress to secure this legislation during the present session of Congress; and, be it further

—Committee on Trade Relations.—

Resolved, That a committee be appointed by this Association to be known as the Committee on Trade Relations.

That this committee shall obtain statistics and data for furthering the use of burned clay in building structures, and cause such data to be printed as extensively as possible; that in all this the Chairman shall be assisted by the individual members, all working heartily for the more extensive use, not only of fire-proof business structures, but of fire-proof houses as well.

That this committee be empowered to represent this Association in all matters of public buildings, and shall work with the supervising architect, as well as others in public authority, for the more extensive use of our wares in public buildings.

That this committee extend our thanks and hearty co-operation to our trade and architectural journals that are working to this end.

That this committee shall also labor for the further extension of the popular movement for good roads, representing this Association.

That this committee shall also represent this Association in the matter of the inauguration of a cabinet department of "Manufacture and Trade" by our government.

That this committee shall investigate as to probable public buildings, and shall call to their aid any member of this Association whose aid may be required, and that all such members shall use all their efforts to assist by all means in their power.

That Mr. F. C. Manson shall be chairman of that committee, and that all members of this Association shall be members of that committee, subject to the call of the chairman.

—Record of Street Repairs.—

Resolved, That this Association approves of the system of recording the service of pavements in the city of Minneapolis, and recommends to other municipalities the adoption of a similar system.

Your committee also recommends the adoption of the following resolution:

Resolved, That we convey to his Excellency, the Governor of Ohio, to the Attorney General, to the city officials and local brickmakers, to the Builders' Exchange, to the local associations and their ladies, to the daily press and to the managers of the Great Southern Hotel, our sincere thanks and assurance of our appreciation and full enjoyment of the warm and cordial hospitality that has been extended to us during our sojourn as the guests of their city in the thirteenth annual Convention of the National Brick Manufacturers' Association, now assembled, in one of the most successful conventions yet held by the Association.

J. W. CARSON, Chairman;
F. W. MEEKER,
F. C. MANSON,
Committee. H. W. GERKE,
L. C. BESLEY,
GEORGE O. BERRY,
ROBERT NESCH,

Columbus, Ohio, Feb. 9, 1899.

Mr. Evans Jones: I move the adoption of the report as a whole .

Mr. George O. Berry, Columbus, Ga.: Second the motion.

Motion carried.

—Miscellaneous Business.—

Mr. Purington: Some eight years ago there came to us with the Secretary of this Association a little girl about thirteen years old, who was, even at that time, extremely proficient as a stenographer. She was a phenomenon in that way. She has been with us now at every Convention for eight years, and I think we have all learned by the services she has rendered to this Association to appreciate her. I want to move that Miss Addie Wallace be made an honorary member of this Association for life. (Applause.)

Motion seconded by several members.

Treasurer Sibley: I call for a rising vote.

Motion carried unanimously.

Mr. Eudaly: Of course we have a great many things to be thankful for. But in this meeting here in Columbus, I think we have reason for being specially thankful in that we have been exceedingly fortunate in the officers we selected for this Association to preside over this meeting, keep the records and the finances, and I therefore move that this Association extend to these gentlemen and the honorary members a rising vote of thanks.

Mr. Ittner: I second that motion with pleasure.

The motion was then put to the house by Mr. Eudaly and carried.

Mr. Purington: It seems there has been one thing neglected. It was overlooked by the Committee on Resolutions. I do not want to go back on our record. We have made no provision for our scholarship at the State University, and I therefore move that the usual amount of $250 be continued for our scholarship the coming year.

This motion was seconded by several members and carried.

Prof. Orton: The programme for to-morrow, gentlemen, will include a trip to the university, leaving here at 10 o'clock sharp. The local committee has provided for a special train of street cars, and we will start promptly on time. I suppose if any of you miss the special cars you can easily find your way out there. It will only cost you a nickle if you are left, but if you go with us it will cost you nothing. When we arrive at the grounds we are going to take you through all the principal buildings, and at noon a lunch will be served by the University Board in the gymnasium building, and I sincerely hope you will all remain over and go out to the University with us.

At this point in the proceedings President Richardson again took the chair.

F. H. EGGERS, Ex-President, Cleveland, Ohio.

Mr. Ittner: In behalf of Prof. Orton I want to say a few words. I hope you will all go out to the university to-morrow. I know it will be a great disappointment to the professor and the university faculty if we go out there to-morrow as a corporal's guard. I would like to see every member of the Convention there.

President Richardson: Before adjournment I want to say a word. My duties so far as this Convention is concerned are at an end, and I want to thank you all for your kind appreciation of my efforts, and I want to wish you one and all a prosperous year, and express the hope that you may all return to our next Convention.

Mr. Purington: I move we adjourn sine die.

Seconded by several and carried.

THE END

THE ANNUAL POWWOW.

A Fine Banquet—Address by Governor Bushnell—Plenty of Music and Speeches Galore.

THE LOBBY of the Great Southern presented a very animated appearance Tuesday evening as the brickmakers thronged in from all quarters of the country and engaged in earnest conversation, narrating the experiences of the year and discoursing on the outlook for the coming season as only brickmakers do. A colored quartette gave frequent vocal selections from the balcony, so between the "coon melodies" and the buzz of social discourse time passed quickly. Sharp at 9:30, the appointed hour, the throng passed into the spacious, beautifully lighted and decorated dining hall, where plates were laid for 350 guests. When all were seated the following menu was excellently served:

Oyster Cocktails. Olives. Salted Peanuts. Celery.
Puree of Tomatoes aux Croutons. Chicken Croquettes with Peas.
Brickmakers' Punch. Roast Fillet of Beef with Mushrooms.
Mashed Potatoes. Fresh Shrimp Salad.
Neapolitan Ice Cream. Fancy Cakes.
Fruits. Coffee. Cigars.

Between the musical numbers the hum of brick talk drowned the clatter of silver and china, and an hour and a half was pleasantly passed before cigars were reached and Prof. Orton, as toastmaster, called for order and introduced the first formal speaker of the evening, as follows:

PROF. EDWARD ORTON, JR., Toastmaster, Columbus, Ohio.

PROF. ORTON'S INTRODUCTORY ADDRESS.

Toastmaster Orton: Gentlemen, it devolves upon me to bid you welcome here this evening. Columbus has all sorts of welcome for the National Brickmakers' Association. We can welcome you as a State; we can welcome you as a city; we can welcome you from the Board of Trade; we can welcome you from the University, and, best of all, we can welcome you from the local brickmakers.

But, in order to welcome an Association of this size and importance properly, above all is needed the proper man to do it. It needs a man to whom the gift of language is given; it needs a man whose ideas flow, and to whom beautiful sentiments follow one another on the tip of his tongue; and the local committee had such a man to preside over this occasion. You will find on your menu cards the name of Mr. J. Y. Bassell. Mr. Bassell is a gentleman whose ideas are on a high and elevated plane, whose kindliness of nature shines out from every line of his face, and he is gifted with that wonderful gift of nature—a silver tongue. It is a source of infinite sorrow with me to-night that he cannot be present with us, and I think you all know the reason why. I shall not dwell on that side of the situation further, only to say this: That, while Mr. Bassell cannot be with us to preside over these festivities, at least I have the great pleasure of securing for you the official welcome of the society which has tendered this beautiful ovation in your honor. We will listen to an address of welcome by Mr. O. A. Miller, President of the Columbus Board of Trade.

THE BOARD OF TRADE'S WELCOME.

Mr. Miller: Mr. Toastmaster and Honored Guests, Members of the Brickmakers' National Association—On behalf of the Columbus Board of Trade, upon whose invitation you are here assembled, I give you most cordial greetings of welcome. In journeying hither, when you crossed the borders of our State, you came within the heart of the Nation. If Ohio is the heart of the Nation, Columbus is the heart of Ohio. Here it is. Take it. Use it as you will as long as you like, and if perchance any or all of you should remain permanently, or at any future time come to cast your lot with us, we will still unite to do you good. We take in the stranger, not to fleece him, but to enrich him, knowing that in so doing we but add to the public store.

When I was a boy, a few short years ago, I was told that competition was the life of trade. I am glad in this short span to have witnessed the gradual acceptance of a better word, "co-operation." (Applause.) This is to be the keynote of the twentieth century which will open up before us the grandest panorama ever set before any people in any age. Let us go on as we have begun, and untold blessings with treasure without measure will be ours.

I regard the acceptance of co-operation in the business world one of the greatest achievements of modern times. How different from the old days of competition and cut-throat methods, now that reason and good fellowship have begun to be employed to bring men of kindred interests together to consider what is best for all.

We trust you may have a most profitable meeting, and I assure you it gives me great pleasure, gentlemen, to meet you upon this occasion, and to have the distinguished honor of welcoming you to Columbus upon behalf of the Columbus Board of Trade. (Applause.)

Toastmaster: Gentlemen, we have been welcomed by our host this evening, and I want the gentlemen who have tendered us this welcome to feel that we as brickmakers appreciate it, and I am going to name as our spokesman for this occasion a man who, I am sure, can properly express the gratitude we feel for this ovation. He is a man who needs no introduction to you; he is a man who has already been described to you as a model brickmaker; a man whose head and whose hands and whose heart are in the business—Mr. Willard D. Richardson, of Shawnee. (Applause.)

PRESIDENT RICHARDSON'S RESPONSE.

Mr. Richardson: Gentlemen—When we received the invitation from the Columbus Board of Trade to hold our thirteenth annual Convention in their city I think it was the general opinion that we would be pleased to accept that invitation, although we had calls in other directions, and largely for these reasons, not alone because Columbus is the seat of our clayworking school, in which we are all so much interested, but because of its central location, midway between the most populous cities of the continent, accessible by rail from all directions, and ending in one of the finest depots in the county, but we knew that Columbus had elegant hotels that could properly entertain this large body of men. But we did not know, I am sure, that we would receive such a cordial welcome as we have received to-night, and have such an elegant entertainment spread before us.

The position which I occupy to-night, notwithstanding the introduction I have had, is a rather peculiar and unfortunate one. I never have considered, and I cannot believe that I would have been selected to make a response to this address of welcome had it not been that this afternoon I was elected President of this Association, and it had already been announced that the President of the Association was to make this response. Had it been otherwise I am sure that we have men here who could have made a much more fitting response to this welcome that we have received than it will be possible for me to do, and when I came to this banquet to-night it was not my intention—I had not given it a thought—to attempt to make any speech such as might be expected upon such an occasion as this, and all that I can do is to say in behalf of the members of the National Brick Manufacturers' Association that we heartily appreciate the cordial welcome which we have received from the Columbus Board of Trade, and I might say also from the local brickmakers of Columbus. Surely I have personally been well treated at their hands to-day, and I believe that it must be the intention of the toastmaster here this evening to call upon some of our after-dinner orators to respond to the welcome which we have received and which we are still to receive from the people of Columbus. (Applause.)

Toastmaster: In addition to the welcome of the city and the Board of Trade, gentlemen, you are to hear, also, that Ohio bids you welcome. In fact, the gentleman who is next to address us has been so anxious to present his personal congratulations to this body that he has made a flying trip here, arriving even after we sat down, in order to be present with us and bid you welcome. He responds to the toast "Ohio" very frequently. The number of times, I suppose, is pretty well up into the hundreds by this time, but I don't believe he has ever before been compelled to respond to a toast on bricks, and I am afraid he is about to characterize me as a very refractory style of brick for putting him in such a dilemma. However, I shall now present to you our Honorable Governor, Asa S. Bushnell. (Loud appluase.)

OHIO'S WELCOME BY HER GOVERNOR.

Mr. Bushnell: Mr. Toastmaster and Gentlemen— Two years ago one of the Governor's of this State was visiting me when I lived in a neighboring city. It was necessary for him to leave early in the morning, what we would all call early, we that live in the cities. Those of you who make brick and are obliged to get up very early probably would not have considered it so early. But a lady called to see him on some business connected with her husband's employment in one of the institutions here in Columbus, which we call the "O. P.," and when I told her that the Governor had left, "Why," she says, "If I'd a know'd he'd a went so early I would have came sooner." Gentlemen, I could not come any sooner. (Laughter.) I came as rapidly as the train would bring me, and I am here now to bid you welcome to the State of Ohio and to its capital city. Those of you who come from beyond the borders of this noble commonwealth I bid you welcome; those of you who are fortunate enough to live in this great State of Ohio, I bid you welcome to your own.

We are told that we cannot make bricks without straw. I have been over to Springfield to try and gather up a little straw that I might be able to make bricks. The nearest that I ever came to being a brickmaker was when, in 1851, I was employed as an offbearer in the brickyard of Colonel Price, at Cincinnati. (Cries of good! Good! Applause.)

Gentlemen, you do not know, those of you in your calling, what honors may come to you.

I am delighted to see you here to-night. You have been welcomed to this beautiful city of Columbus. You know yourself by this time that they are very hospitable people here. They are here in Columbus; they are all through the State of Ohio; you will always find a hearty welcome here, those of you who live beyond our borders, in Columbus and at any point in Ohio, whenever you come within this noble State.

I have been asked to say something about the clayworkers and the clay interests of Ohio. Probably I shall say things that you all know better than I do, but I want to say them to you because I have been interested in hunting them up, and I assure you that I shall know more about these things when you come here next year, as I hope you may, when you hold your Convention again. (Applause.) I expect to learn a good deal here this evening from the gentlemen who have spent a good portion of their lives in the manufacture of a product that is of so great importance to the people of this country.

Ohio is the leading clay-working State in the Union. We make a larger gross output of clay wares than any other State, the valuation amounting to nearly $20,000,000 per annum. Besides this enormous sum the value of even our local production assumes a secondary place. And, besides having the gross output, Ohio leads in nearly every individual line as well.

Take, for instance, the white ware pottery industries. The potteries of East Liverpool and other parts of the State turn out an annual flood of ware, exceeding 50 per cent. of the entire national production. No finer ware is made in the world for the practical uses of life than that that comes from the East Liverpool potteries. The trade began here back in the thirties, and has grown up from the making of the commonest red cooking crocks to the most delicate and translucent china and porcelain. And this is the most conspicuous place in America for the production of white and yellow ware, which surpasses in value that of any other city in the United States or the world.

To illustrate what "mighty oaks from little acorns grow" in manufacturing let me say the founding of this branch of industry in East Liverpool and in the United States as well was by James Bennett, an Englishman, who, in 1839, emigrated from Derbyshire, England (where he was a packer of yellow ware pottery), to America. Traveling late in 1839 from Cincinnati on foot through Ohio in search of employment, he tarried at East Liverpool, and, discovering the presence of clay well adapted to the production of yellow ware, he conceived the idea of engaging in the manufacture of that pottery. He had no means of his own, but with the assistance of others whom he interested he built a small pottery, 20 by 40, and entered upon the manufacture of ware.

He burned his first kiln—mostly mugs—in 1840. From this kiln he realized a profit of $250. In 1853 he sold his pottery to Mr. Knowles, who transferred the most of the structure to the present site now occupied by the Knowles, Taylor & Knowles Pottery—the largest in the United States and the world.

And, may I not add, that the policy of protection of our country has made possible the development of this industry and the marvelous growth of the city of East Liverpool and other points where the manufacture of pottery has been introduced. (Applause.)

In the line of stoneware Ohio is the pivotal point in the Union. The Ohio potters sell their ware on both the Atlantic and Pacific coasts. Twenty-five years ago the stoneware potteries were represented by little log cabins and wayside shops dotted over the country around Zanesville and Akron. Now we have large and commodious factories, employing crowds of workmen and making ware which the potters of those days would not recognize as being stoneware at all, so vastly has it improved.

In the sewer pipe line Ohio makes over 50 per cent. of the total output of the country. The National Sewer Pipe Company at Barberton is the largest plant of its kind in the world, and virtually represents four ordinary plants in one. The second largest plant is also an Ohio institution, located at Midvale, Ohio.

In the paving brick industry Ohio is virtually the pioneer. In this State, and in this city, almost the earliest development of the paving brick business as a fixed industry began, and until comparatively recently the other cities of the Union have been sending their engineers and clayworkers to Ohio to see how the new business has been developed and what its conditions of success are.

In common brick and fire brick the trade of Ohio is exceeded only by those States which have a larger local demand. Pennsylvania surpasses us in fire clay on account of the vast demand made by Pennsylvania iron industries, and several States surpass our total output of common brick by reason of the great cities to which they minister. But nowhere is the quality of Ohio's output surpassed in either of these lines.

The fire brick of Southern Ohio and the beautiful building brick of the coal measure counties of this State are eagerly bought in the most critical markets in the world. Besides these strictly utilitarian products Ohio has the distinction of leading in the realm of beauty as well. A distinctive type of ornamental pottery has been produced, first by the famous Rookwood Pottery of Cincinnati, and lately a number of ambitious aspirants have appeared to share the market, the most beautiful of which is the Louwelsa, of Zanesville. Scarcely an important museum in the world which does not contain more or less beautiful pieces of our typical art pottery.

Why has Ohio attained this high position in the ceramic industry?

1. She has the materials. Our hills and valleys yield no gold or silver, or marble, or precious stones, but they yield the essentials of a far more enduring wealth in the coal, iron and clay.

2. She has the men. No one can outstrip the Ohioan in what he undertakes, whether it is running for the presidency or in making paving brick. Ohio's plucky and active-minded sons are the material outgrowth of their happy environment.

HON. ASA S. BUSHNELL, Governor of Ohio.

3. She has the scientific training. Ohio is the first and only State to recognize that in the economic warfare of the future the laurels are going to rest on the brow of those who have entered the struggle properly trained for the work.

The contests of the past have been those of a new and rapidly-growing commonwealth, where energy and strength were sure of their reward. But in the growing competition of modern times the victory will come to him who brings to the aid of this energy and strength the best and fullest aids which modern science and technical training can give.

And Ohio, with her clayworkers' school, is fitting her rising generation to hold the supremacy which we have already won. The only school of the kind in the United States; there will probably soon be others, but, gentlemen, I think so long as the gentleman who now controls that school is able to continue it Ohio will be in the lead in the clay-working industry. (Tremendous applause.)

Gentlemen, I congratulate you on the fact that you selected Columbus as the place for holding your Convention, and I assure you that you could have selected no place that would have given you a warmer welcome or that would have shown more interest in the business which you follow and in which you are interested. The Board of Trade, I am sure, they are glad—it is a great pleasure to them to furnish you this collation and to thus recognize the clayworkers of the Nation. I am myself happy to see the people who are devoted to the earth, as you might say. I don't mean by that, gentlemen, that you want all the earth. (Laughter.) You haven't shown any such disposition, but you take a good part of it in your business. (Continued laughter.) But we are glad to see the agriculturists, and we are glad to see the members of the different Boards of Health of the State, and we are glad to see all of these men that are engaged in the different industries. I have seen a great many of them in my short official life. It has given me pleasure to speak of Ohio. As your toastmaster has said, it may have been a hundred times. Gentlemen, it would not have been too many for me if it had been two hundred times.

I am always ready to speak of Ohio, and am glad to meet these different associations, and among them all that I have met I have not had the pleasure of welcoming a better-looking set of men (cries of "Well! Well!"), a more intelligent set of men (laughter and applause), and men who, I am sure, will leave their impress upon the business interests of this country. Again I welcome you, and I shall hope to have the pleasure of meeting you here again. You will have to, gentlemen, hold your Convention a little earlier in the season if you come to Columbus next year and I am to welcome you in the same capacity of which I have to-night (laughter), but whether it shall be that or whether as a private citizen I shall always remember this meeting with you here, and I shall hope to meet you, if not collectively, as individuals as we pass on through life, and I wish you all abundant success. I wish you good health and that your business may prosper.

We are living in a great age. We ought to be happy for that. Why, at that time when James Bennett came to East Liverpool and discovered that clay there in 1839, there were 640 people engaged in mining coal in the State of Ohio; now there are twenty thousand coal miners in the State, and that shows how the business of the State has grown. And this doesn't apply to Ohio alone. It is true everywhere in the United States. But we are speaking of Ohio. Ohio has a million of her sons and daughters living west of her borders, and she has ten of her sons representing other States in the greatest legislative body in the land. This is not detrimental to the other States; it shows simply that the people of those other States are discerning people (laughter), and they recognize talent whether it is native born or whether it comes from Ohio. (Applause.)

—A Diversion.—

(At the conclusion of the Address of Governor Bushnell, the class in ceramics at the Ohio State University contributed their share to the applause in the shape of their class "yell.")

E. S Morse, New Britain, Conn.

Toastmaster: I remember hearing once a story of an old colored coachman down South, who had been in the family a long while, almost too long, perhaps, for, whenever any of the young "missus's" or "mas'rs" would come to Uncle Remus and request him to get out the carriage and take them to the station or town, Uncle Remus always had the same story to tell—the off hoss had a sore foot. One day the young missus came down, and she needed to go to town very bad. She worked on the sympathies of Uncle Remus's wife, Hetty. Remus put up his customary story, but Aunt Hetty couldn't quite stand it that time. "Foh de Lawd, Remus," she exclaimed, "yo done tol' that ol' lie so oft'n you believe it 'yose'f." (Laughter.) I believe the Governor has got so used to talking about Ohio that he actually believes all the stories he tells about it. (Continued laughter. Applause.)

But, gentlemen, we are not all from Ohio. Of course, all of the office holders are, but we are not all from Ohio. (Laughter.) We have with us to-night a gentleman who represents another State—another great clayworking State, and, above all, a man from that State who is particularly adapted to tell us something of the clayworking and clayworkers outside of Ohio. I have the pleasure and the honor to introduce to you now Prof. H. A. Wheeler, of St. Louis. (Applause.)

PROFESSOR WHEELER'S RESPONSE.

Mr. Wheeler: Mr. Chairman and Fellow-Members—In these days of expansion I think we ought to take our cue from primary sources. Long before our National Government was imbued with its present spirit there was a little village on the lakeside that started expansion on such a scale that it only stopped at those little places in New York harbor because there were too many Tammanyites there; that only stopped from absorbing the little town on the muddy little Mississippi because they didn't want it. It is a town that when they want to buy a sack of flour why they do it to the tune of eight or ten million dollars' worth. If they want to buy a piece or two of meat why they take $40,000,000 worth or more. Now, in this place, where everything expands on such an enormous scale, where such enormous fortunes are made in brick, occasionally they do go abroad to see if there is anything like as large as they are, and it is said that a certain Mrs. Smith, traveling around through the world, stopped at Paris for a few days to see what Paris had to offer to entertain the Chicagoan. She wandered around the art galleries and rubbed her nose around those dusty old masterpieces and couldn't see what made them so valuable (she was told they were worth a great deal). She was shown some of the fine architecture, and she said: "We can do ever so much better than that over home. Our buildings are much larger," and so on and so on, until finally she entered a place where she did see a vase there that was a little larger than any they had, and, as they valued it at $25,000, perhaps, it was worth a little more than any they had. And she was shown the smaller pieces, the guides calling attention to the beautiful coloring, the handsome designs and the classic features. Finally she said she would like to see what that kind of stuff was made of. A little piece worth more than its worth in gold had been shown her. "What do you make this of?" she asked. "Diamonds?" So the guide sent down to the workroom for a piece of the raw material, and when it was brought the guide called attention to its plasticity and its beautiful fine grain. "Why," said she, most contemptuously, "that's only mud." So if Mrs. Smith says clay is only mud I suppose I am citing an undoubted authority. (Laughter.)

So when we came to Ohio to see these wonderful clay industries I, of course, expected to see clay of all kinds and all quantities from the time of entering the depot. I looked on both sides of the car all the way down to the hotel, and didn't see any signs of this mud. I drifted out to the forests in which are built your university buildings; I still failed to see any mud. I have been here three days, and yet all the time this chilly white material covering your streets, and which you all call snow, hasn't even got a trace of a brown tone to it. Why, if you should come to St. Louis the snow there is of a brunette hue long before it touches the ground. (Laughter.) But, thanks to Brother Purington, our streets are at last slowly but surely getting out of the mud. And if you will come to our exposition in 1903 we hope by that time that Brother Purington and other brickmakers will have the streets in good shape for you. Of course we don't intend to outclass the Chicago Exposition. We freely admit that that was an exposition of which we all ought to be proud, and we undoubtedly are, but we will give you something very different, unique in itself; we will give you something typical of the Mississippi valley.

But we have also other kinds of clay in Missouri. In fact, the refuse of one of our lead mines is most eagerly sought after by your famous Rookwood Pottery. And the reason, I presume, our Missouri clay industries have not been developed as extensively as yours in Ohio is because our fire brick never plays out, and our sewer pipe doesn't go to pieces as the Ohio pipe does, and consequently the orders our St. Louis factories get are all for original material; and our bricks, I am sorry to say, don't have the way of disappearing through the interference of a warm zepher, as I saw happening down on High street the other evening.

While I will admit that Missouri has clay that is in most instances far superior to Ohio, I will also admit, however, that there are some clays that we do envy Ohio, and there is one in particular, while we have such clay in the form of Benton, and Bates, and Blair, we still have to honor Ohio and reverence her for her several examples of that clay, and above all, for that noble character that has carried this country through such a trying time and with such statesmanship as William McKinley. (Applause.)

We do envy Ohio for that kind of clay. Still, there are a lot of young Missourians, and there is hope for us yet, especially as some of them are on the brickyard wheeling brick. (Laughter and applause.)

There is also another feature connected with the Ohio clay industries that we in Missouri do also envy you, and just before I left St. Louis one of our members quietly said: "Now, Wheeler, you go up and look at the Ohio school. You see if you can't get some pointers there that will enable us in Missouri to start a better clay school." After looking around I must confess that we will have to do a great deal before we can even rival the Ohio Clay School. (Applause.)

And the party who requested me to make this investigation is one of the numerous workers in the art clay industry, and one who keenly appreciates, as I think we all do, that the future progress and future advancement of our art depends upon our taking advantage of all we know and all everybody else knows, gleaning and binding together the brain work and the efforts of clayworkers all over the world, analyzing and combining theory with practice, trying to accomplish what, for instance, has been accomplished in the iron industry. Twenty years ago, when I took my first lectures in metallurgy, I well remember one morning our professor came in and with great glee and pride he said: "Thompson, at Pittsburg, has made two hundred tons of iron in twenty-four hours." There in one day they had made as much as only the previous week he had told us we could do well if we could make in a week. Before I graduated, two weeks later, the record had climbed to 250, in another half year to 300, in a few months more to 400 tons, continually climbing until now, I do not know exactly, but think it is now about 700 tons. So that I know that the modern pig iron furnace is now turning out more iron in one day than fifty furnaces could twenty years ago. We are now beginning, and I think we are going to permanently retain it, to furnish Europe with iron. We are building up a big export trade, and the outlook for future expansion in that line is most promising. That is what the iron industry has accomplished by combining brains and brawn, theory and practice. And that is what we should do. Combine theory and practice, giving these theoretical fellows a chance, letting these scientific cusses come around and help us here a little and there a little, and putting them into practice.

This society has made a most important start in beginning to accomplish what I hope in time will enable us to stop entirely our dependence upon Europe for ceramic wares of all kinds. Some of us seeing a new opening to more rapidly hasten our advance in ceramics have formed a little new organization, built almost entirely out of the membership of this society, and we are going to add our little mite in furthering and advancing ceramics, so that the addition of the mite of this one and the mite of that one, taken collectively, will finally accomplish not only our independence from Europe, but enable us to do in ceramics what the iron and steel people were able to do in their lines, ship to Europe quantity and quality. Accomplish in all lines what Ohio has already accomplished in one, bringing out one of the finest and most beautiful lines of ceramic ware that the country has ever produced.

And may this Association continue to do its work so that eventually we will be able to say that of all lines, and not only take care of our own trade, but carry the ceramic expansion until we take care of the European trade as well. (Applause.)

Toastmaster: For some time past, in fact ever since we were favored with vocal music some time ago, I have seen signs of rapidly increasing pressure of steam in our Vaseline Quartette. I don't think they can be persuaded to hold in much longer, and I think we had better uncork them right now. (Applause.)

"DAISIES."

Air: "Sweet Bunch of Daisies." Words by C. McDermott.

There's a convention, meeting once a year,
Where the brickmakers come from far and near
To meet their comrades in working clay
And learn the latest improvements of the day.
Refrain:
Sweet bunch of daisies, gathered from afar,
Yes! they are daisies, that's what they are.
Just look them over—carefully do—
Ne'er saw their equal—honest—did you?

Some come to learn things, to become more wise,
Some come because here they can advertise
All kinds of good things, dryers, machines and kilns,
Guaranteed to drive away all brickmakers' ills.
Refrain:
Sweet bunch of daisies, trying hard to sell,
Yes, they are daisies, and don't they do it well?
Just look them over—carefully do—
Ne'er saw their equal—honest—did you?

First, there's the kiln men, always in the fore;
You cannot dodge them, they are out for gore;
Modest Eudaly, Alsip and Pike
Swear their kilns are different, but they're all alike.
Refrain:
Sweet bunch of daisies, trying hard to sell,
Yes, they are daisies—don't they do it well?
Just look them over—carefully do—
Ne'er saw their equal—honest—did you?

Listen to the dryer men, singing their sweet song,
Telling how to dry bricks—it doesn't take 'em long;
Build a little tunnel—put some pipes in right—
Squirt in a little steam, and it dries 'em over night.
Refrain:
Barron's got a daisy, calls it the "Iron Clad,"
Just say "Standard" to him, he'll get fighting mad.
If you get a dryer, and get one of these two,
You'll wish you'd got the other, that's what you'll do.

Next, the machine men, with their lovely tales;
None can deny them, or stop their making sales.
If you're going to purchase, quickly close your deals,
Or else you'll soon have the whole gang at your heels.
Refrain:
They will talk to you, they'll pray with you,
They'll make love to you, and stay by you
Until you wish they were up in Klondike,
And give your order to get them out of sight.

Just wait till Friday; we'll go see the school
Where they are making clayworkers by rule,
Teaching them rockology, mathematics,
Thermostatics, algebra, and dif'rent 'rithmetics.
Refrain:
Egyptian history, astronomy,
Trigonometry, and geometry,
Archaeology, chemistry, physics,
When all mixed with horse sense, they can make good bricks.

There is a certain gang been coming here for years,
Out for a good time and never shedding tears.
One of them's our Chaplain, but he never prayed a bit;
If Flood would do that the devil would have a fit.
Refrain:
Sweet bunch of daisies, from Philadel',
They're not only daisies, but corkers as well;
McAvoy and Floodie, say; but ain't they proud,
Just because they're leaders of that Quaker City crowd?

Toastmaster: Gentlemen, we will have a little more music a little later in the programme. The Vaseline Quartette are very much like our natural gas wells in the northern part of the State. They flow very strongly and at a high pressure for a little while, but, after that, the pressure runs down, and you have got to put the valve on and let it accumulate. We will give them a little period of incubation now. (Laughter.)

The last formal address of the evening was to have been on the subject of "Our Association," and I have here a letter from the gentleman who was to have responded to it.

My Dear Professor Orton—I am duly in receipt of your very courteous favor of the 30th ult., in which you say that I shall be expected at the banquet to respond to the toast, "Our Association," and if not able to be present to send a response in writing. Now, my dear Orton, don't you know that a response of this kind, to be successful, must be inspired by the enthusiasm of the occasion; it must be spontaneous, off hand; "Mr. President, I had no idea of being called upon, etc., etc." I fear that cold type will spoil the flavor. However, if each guest will follow the recipe "Flavor to suit," the company may possibly get successfully through this crisis.

"Association" indicates a drawing together of kindred spirits. A merging of interests and our association is, in my opinion, one of the best illustrations of this nineteenth century idea.

"Competition" leads to strife. It stimulates the savage part of our natures. Our nationalist friends say that under the present system of competition the strong, that is, the intellectually and financially strong, trample and destroy the weak as brutally as our heathen ancestors of yore trampled down and destroyed the victims of their barbarian greed, and there is much truth in this. "Association" is the antidote of this spirit. It takes away the "thirst of blood," so to speak, and substitutes in its place a spirit of friendship and fair dealing even between competitors. Our association is, in my opinion, one of the most successful of its kind in this country. May it continue to prosper and have its good influence in the direction of developing in the commercial life of our beloved country that spirit of good will which shall lead us as a nation to a higher interpretation of that great principle upon which rests the hope of humanity, the universal brotherhood of man.

With kind regards to all the good brethren, and regrets that I cannot be with you, I remain yours truly, GEO. M. FISKE,
Boston, Mass., Feb. 4, 1899.

C. McDermott, Song Writer and Vocalist, Wellington, Ohio.

Toastmaster: The spirit of the occasion is a potent spirit, and we have with us to-night a worthy son of a worthy sire, and I am going to take the liberty of calling on him to add a few words to those so well put by his father (applause)—Mr. J. Parker Fiske.

ADDRESS BY MR. J. PARKER FISKE, OF BOSTON.

Mr. Fiske: Mr. President and Gentlemen—I am sure that when Prof. Orton came to me a few hours ago and asked me to add a few words to these remarks of my father's, that he didn't know that a good many years ago, when I was a small boy, my father taught me that when he had finished speaking I had better keep still (laughter), and I hesitate to make any remarks here this evening because my father isn't here to tell me, as he has often had to do in the past, when I have said enough. (Laughter.) There is one feature, however, that I would like to mention, and that is that the toastmaster has asked me to be brief, and, speaking of that matter, I am reminded of the story of a man named Finnegan who was hired by one of the Eastern street railways a short time ago to occupy the place of motorman, and he was instructed that at the end of his day's work he must bring in a report, and so at the end of his first day's work, anxious to curry favor with the management, he brought in a four-page report describing all the events of the day, and the manager, taking it up and looking it over, called Finnegan to him and said: "Finnegan, I can't take an hour or two every day to read this report. Now be brief next time. Be brief." So Finnegan the next day brought in the following report:

"Out, in, out again, in again. Finnegan." (Laughter.)

It is hard to be brief on the subject which is now before us, namely, "Our Association," because it's a great subject, and to properly cover such a subject would require a long time, more experience, more wisdom and more eloquence than I possess. And I am not going to speak of many phases of the Association work. I am not going to speak of the great good which comes to us through it, the unquestionable good of coming to these Association meetings and listening to the technical discussions which send us away better prepared for the technical problems of our industry, and I am not going to speak of the good which comes to us by coming here and telling our troubles and hearing of the remedies which other people have applied to those troubles, but I am going to speak of one single feature of our Association which I believe is of very great importance, and that is the social feature. The effect upon us as men of coming here, of gathering together, or grasping each other by the hand, of looking into each other's faces, and speaking to each other from our hearts, man to man.

It has already been intimated that competition is a bad thing in many respects, and that co-operation will be the watchword of the coming century, and I fear that it is true that in the rush of business, that in the keen, sharp competition in which we all are obliged to indulge, that there are fostered in our hearts many feelings towards our competitors which are not right, and which this Association, I believe, indirectly, but at the same time uterly, is overcoming.

It is not right for us to have feelings of resentment and bitterness and hardness in our hearts against those who are struggling against us in the commercial world, and I believe that coming together here and conferring, as we do, with our competitors, and realizing that we are brother workmen, and brother craftsmen, and brothers in trade, I believe that that in time is going to have its effect, and I believe that all of us go away from these Association meetings not only better technologists, not only better brickmakers, but better men, and so I say:

Let the Association prosper, and may it grow sronger every day, every year, and may its influences go abroad and bring in those who are not now enrolled among our members. (Applause.)

Toastmaster: Gentlemen, there are a great many members of this Association who can speak, who like to speak, and who we would like to hear speak, and if by chance at an occasion of this sort we should pass by without calling on our friend with the buttonhole, I think I would be mobbed immediately upon getting out of the room. I will call on Mr. Gates, of Chicago.

OUR OWN AND ONLY BUTTONHOLER'S IMPRESSIONS.

Mr. Gates: Brother Members—Our worthy toastmaster just looked over at me in a significant way, and I looked at my watch and looked at you, and I was in doubt as to whether you could be held here even three minutes longer. I have no ambition to try to hold you to exceed three minutes, and I will not promise that.

It has been said that in a Sunday school in Chicago (this is a true story, gentlemen) (laughter), the teacher, in questioning her little pupils, said: "Johnny, why do you say your prayers before you go to bed?" Johnny immediately answered: "Because I sleep in a folding bed." (Laughter.) Gentlemen, I felt very much as Johnny did when I started for this Convention. I didn't know but what the night might be peaceful and the bed not shut up, and yet again it might. When I started for this Convention I didn't know what might happen. I said my prayers and came. (Laughter.) I did feel a little bit of safety as I sat between the Governor and the Atorney General of the State, but even their protecting care didn't save me.

There is one thing I must speak of here that has come to light to-day. Along some time since in the school at which we have visited here in the city there were some young fellows who had very honestly started out to make their way in the ceramic history of this country. Independent young fellows who were working their way. These young fellows are straining every nerve to bring about the object of their desire, and it transpired that a member of this organization, who is one of the best friends that God ever gave to any of us (and you never could recognize him by that description here, because there are so many of you that fill the bill), sent down to Prof. Orton some money to use as he saw fit. This has leaked out to-day, and I want to call your attention to it. Prof. Orton took that money, and those boys worked for that money, and began the business of translating Seger, the classic that we have all along so honored, and by that means they have worked their way so that Seger is to be published and the book of Seger is to be opened to the eyes of Americans through the action of a brickmaker, and through the action of our professor, and through the action of those earnest boys from our school. This has impressed me very deeply, gentlemen.

I have talked of the future at most of our meetings. This time I look to the past. And I am going to talk seriously for a little while. I have continually had in mind since I have been here the days last spring when there was centered upon my sick bed the kind words from all you gentlemen, and I can hardly speak to you of the effect that they had. I assure you that I never shall cease to remember it as long as I live, and I concur in the remark of a good friend of mine, who said to me: "Gates, perhaps it is worth all the suffering to know where you stand with your friends." I have thought so much of that as I have been here in this meeting. I have thought so much of those vacant chairs that it seems that they should be filled by those brothers who have since departed, and those brothers that we shall miss so very very much.

Gentlemen, there has been a great change since we met a year ago. I recall that while we were in session we received the news of the destruction of the Maine. And we heard the jeers at our own navy, and we hardly knew at that time how large we were or what we were. I remember that since that time that unknown commander of ours pushed out of a foreign port, with no place to go, and a navy that was the laughing stock of all the world, never faltering, but immediately struck for the enemy's port, sailing past forts in the darkness and over torpedoes and exploding mines, jumped into that enemy's fleet and wiped it off the map before breakfast.

I remember that Captain Clark took a product of this country and started on that marvelous trip; not a day did the engines stop until he had reached the Antarctic ocean and turned around the Cape, and, fearing nothing, with his men sleeping by their guns and longing to see their enemy, and completed that trip of 18,000 miles and came in and ran down the pride of the Spanish navy. There couldn't be a better tribute to our navy.

I tell you to-day we are bigger men, we are better men, we are stronger men; we have a country; we have possessions that we have not sought, but they are possessions that we have, and we accepted their responsibilities with them. I tell you, gentlemen, that I am working now on terra cotta for a building in Honolulu that would adorn any of our cities, and I am glad to tell you that I understand that the brick that are going with my terra cotta are coming from the factory of your esteemed townsmen in Columbus. (Applause.)

E. M. PIKE, the Basso Profundo of the V. Q., Chenoa, Ill.

Toastmaster: Several years ago we had a joke in this Association about a two-year-old. It was so good that the following year we made it a three-year-old, and finally it got along to be a four-year-old before we could finally drop it. The four-year-old is not here, but we have with us to-night a gentleman who is only one year old in the clay business, but he has an old head, nevertheless, and we would like to hear just a few words from him. The Hon. Mr. Snyder, of Canton.

HOW IT APPEARS TO A YEARLING.

Mr. Snyder: Gentlemen and Brother Clayworkers—This is a surprise to me. It is a compliment, however, and I feel honored. It is true that I am but a six-months-old. This is my first visit. I am a tenderfoot. And while it may be a mistake, as I regard it, to call me to my feet, I always say a word, and if it is a mistake the audience will find it out. I went into the clay business because I knew it was permanent. Wood is fast becoming less, and the brick business is increasing, I think, over the stone business. I have been pleased to hear the compliments passed here to-night, and I take it as a compliment to be called upon to talk to a body of men that our Governor has been pleased to call the handsomest set of representative men that he ever saw. We have had some ladies here, too, who can well answer that same description. I haven't heard anyone say that they originated from Ohio, but from the compliments passed upon Ohio men I would infer that Ohio had something to do with it.

A number of years ago I had the honor of being a member of the Ohio Legislature. I believed that in the mineral of the State we had a great wealth, and that it ought to be brought to the surface. I attended the Archaeological Society one night at the request of a prominent professor at the university, and they were showing specimens from the mounds of prehistoric ages. Little did I think then that I would return some time to the same vocation, that of clay.

Shortly after that I introduced in the Ohio Legislature a bill to revise the geological survey of Ohio, which was made under the direction of Prof. Newbury. I had a hard time of it. I was told that it had cost the State $300,000. I found that in New York State, where they had a little plumbago, they had spent $1,100,000. Ohio had spent $300,000. I thought Ohio was as great in minerals as New York. And Pennsylvania had spent $2,000,000. I was told that I could never get ten votes to revise the geological survey of Ohio to let the people know what wealth they had under the ground. I introduced the bill, and I want to say that in doing it that I owe a confession; that the greatest help I had was from, not the Prof. Edward Orton, jr., but of Edward Orton, sr., and greatly due to his thorough work, the survey has been revised, and to this and the able report of Prof. Orton, sr., I believe a great deal of the enterprise wihch has manifested itself in this Association owes its origin. His reports do not stop alone upon the birds, animals and fishes. It reaches out and takes in coal and iron ore; then he took up the gases and the oil, and then the clay, and this is one thing, I think, that has helped to increase the progress and the rapid growth of this Association. And it is due to him, as well as to our present Prof. Orton, that this society has made such rapid progress and promises to progress so rapidly and greatly in the future. I regret that I do not see him to-night. I shall call on him before I leave the city. I am glad to see his son, who is leading so successfully the working of this Association. When I sat at the table of Prof. Orton at the time I was at work on this bill I saw his little boy as he sat at the table; also the mother and the sister. And I was surprised to see yesterday that that boy to-day is getting a little bald-headed. I do not know where those years have gone, but I guess we are all getting a year older every 365 days, and at the end of another 365 days I hope he will not be any more bald-headed, but I do hope to meet him at this Association again, and I hope that this Association may continue to progress until we are known as the leading Association of the world. And I promise all that I will try and be present a year from now.

THOMAS H. FLOOD, "Chaplain," Philadelphia.

Now, with these random remarks, which I had no thought of making, I think I will be excused, because, you know, the toastmaster has called me in the start only a yearling. (Applause.)

Toastmaster: Gentlemen, the art of clayworking has a very great many branches. Governor Buhnell has given you a slight resume of some of the numerous branches followed in this State and surrounding States, but it is seldom that we have an opportunity to listen to a man who represents the highest and finest branch of all clayworking—the manufacture of high-grade porcelain. We have with us to-night a man who is proud to call himself a clayworker. He is proud to meet and gather with clayworkers, but he represents the other side of the line. We would like very much to hear a few words from Mr. Binns, a gentleman who comes to us from England, and who is now identified with pottery in New Jersey.

ADDRESS OF MR. CHAS. BINNS, OF TRENTON, N. J.

Mr. Binns: Mr. President and Gentlemen—The hour is a little late, and I don't propose to take up any appreciable amount of your time. But, still, as I feel it an honor to be here I do not see that I can come here and refuse my friend Randall's command. And it strikes me thereby that it is a very happy thing that Randall is a married man—a happy thing for the girls, I mean, because he could never take no for an answer, and he forces me, practically, to comply with his demands.

I have been here, not connected with the brick industry, but assisting at a most interesting function, the birth of a baby. I mean, of course, a baby organization, and while I cannot claim to be in any sense the sponsor of that organization, I can assure you that it is a remarkably healthful infant, and parents and child are all doing as well as could be expected.

A Member: Does it cry?

Mr. Binns: Yes, sir; and I trust its voice will be heard before very long throughout the land, and I hope also that you in turn will learn to lean on its strength. I have unbounded confidence in the future of that infant.

I want to say that it has given me very great pleasure to be here, because I have met so many of the faces here who are in reality old friends. In the pages of your trade journal I have become acquainted with quite a number of your faces, and the words came to my lips: "Why, is this you? I knew you long ago." I told Friend Gates yesterday that I was quite surprised to find him such a youth. And thereby hangs a tale. The last speaker alluded to Prof. Orton getting bald-headed. You know we all take pride in Orton in all parts of the country, and in turning over the pages of the Clay-Worker I came across his portrait, and in talking to my wife about coming here I said: "There's Orton. That's the man who is doing this work." "What!" she said, "that boy!" (Laughter.) Now, whether it was that the portrait was one that was taken a great many years ago, or whether it was that the photographer had done something to give that youthful appearance, the fact remains that Orton is given a remarkably youthful appearance in those pages.

Now, gentlemen, I am not going to talk longer, because I have been told not to talk shop, and I can't talk anything else. I can only say, to use a bit of English slang, that you are about as good a set of bricks as I ever came across, and I can only hope that none of you will ever go through the experience of being fired. (Applause.)

Toastmaster: Gentlemen, there was a speech made this afternoon, in our opening session, which smacked a little bit of combination or monopoly or combine or something of that sort. We have here a gentleman to-night, a gentleman who is death on combines, who goes around hunting for them with his gun on his shoulder all the time. We will hear a word from him, the Attorney General of Ohio—Mr. Frank S. Monnett.

ATTORNEY GENERAL MONNETT'S VIEWS.

Mr. Monnett: Mr. Toasmaster and Members of the Brickmakers' Association—That is my official title at present, Attorney General, but for this evening it was Lieutenant Governor, because there was an apprehension that the Governor wouldn't be here, and I prepared a very nice litle speech, but I handed that to the Goveronr, and he has read it, so that I am lost. (Laughter.) It might bear repeating, but I would not want to repeat my own. (Continued laughter.)

I don't know what a lawyer can say that would interest a brickmakers' association. I never carried brick, as the Governor has. Perhaps I would have as good a business knowledge of it as he has had I done so. (Laughter.) But there is a lurking suspicion in the mind of the layman that a lawyer can appear on all occasions and all subjects, and at least say something that expresses nothing.

Over in Colonel Adams's county last year they tell me they elected a justice of the peace a second time, and the boys thought they would give him a little banquet. They called upon him, after many eulogies and encomiums upon his past regard, and, of course, it was becoming in him to make some remarks, and he got up, and in his German, broken way, thanking them for the ovation, he said it was entirely superfluous to compliment him for what he had done in the last year. He said he had simply done his duty, and, wishing to make a fitting quotation, and getting it somewhat mixed, he said: "I have simply been like Caesar's wife; I have been all things to all men." (Laughter.)

I don't know what I can say to you more than that calling upon me is similar—as expressed in the language of Judge Crawford the other day on a similar occasion. He said calling on a lawyer under such circumstances was like the little girl's definition of a lie. Her mother had knowledge that she had been guilty of some infraction of the truth, and she called her upon the carpet, and after questioning her and learning to her satisfaction that her little girl had been guilty of this infraction, she said: "Daughter, do you know what a lie is?" "Yes, ma'am." "What is it?" "It is an abomination in the eyes of the Lord and a present help every time you need it." (Laughter.) So I suppose that lawyers are sometimes helps in time of need.

I have had some experience with owners of brick yards, and some experience with manufacturers of sewer pipe, and have known something of what the chairman or some speaker has called association and co-operation in bidding for municipal contracts. It is a very convenient way sometimes to get a good profitable contract, and it becomes then the obnoxious duty of the city attorney, which office I chanced to hold at one time, to investigate those matters and insist on competition, and that is one of the matters that your chairman has referred to to-night in saying that I have been death on trusts. It so happens that it is the duty of the attorney generals of the various States, when complaint is filed with them, that any corporation has violated the law of the State, that it becomes their duty to bring that question before the Supreme Court of their respective States in what we call in law quo warranto. If any of you gentlemen are members of a corporation, and exceed your powers and franchises, and another citizen makes complaint, it is the duty of the Attorney General to bring that before the court, and such men as won't do a thing to him if he ain't in the right, too. There is no such thing as a sewer pipe trust or a pottery trust up to date; if there is, don't let me know it. (Laughter.)

Ohio, it has been said, has been the modern home of Presidents, and, as Colonel Adams said here to-night, that while we have had four Presidents since the war elected in Ohio, and five born in Ohio, and he says his two Senators were both born in Ohio, he says the best thing for the Ohio man is to have him born in Ohio and then migrate where they will develop. (Laughter.) But we have a good many men in other professions than that of statesmanship in Ohio. We have a man in the gubernatorial chair that was elevated because he was a business man, and we all say that he has made us a model Governor. (Applause.)

I think that it is fitting that the Board of Trade of Columbus, the capital city of our State, extend to you this cordial welcome. It is certainly fitting that you have to-night a presiding officer as toastmaster that the State of Ohio does not only love, but loves his father for what he has done for us. The name of Orton among clayworkers, among scientists, and among geologists has come to be classic. (Applause.) We turn to him on every occasion for scientific opinion, and he has demonstrated that one-third of the State of Ohio, speaking of it geographically, is rich in clay that is of great value in the manufacture of the various commodities which you who are here to-night represent. About six million dollars of ware was turned out at East Liverpool last year.

W. R. Cunningham, President Clayworking Machinery Manufacturers' Association, Frankfort, Ind,

We of the State of Ohio ask to call your attention to the fact that we have the soil, and we have the men, and have the clay; that we have one of the best Governors (applause); we have the best credit; we have a debt of less than a million and a quarter at present; our bonds on the market are less than three per cent., equal to the Federal Government; we have eight thousand miles of railroad; we have the lakes that have communication with the East; we have more traffic on Lake Erie, I am told by statisticians, than on the entire Atlantic ocean, so that if you gentlemen from St. Louis and Chicago and New York and New Jersey should ever conclude to come to Ohio, we have enough soil, and enough railroads, and enough commerce, to satisfy you all to your heart's content. (Applause.)

Toastmaster: We have heard from Ohio and we have heard from Missouri. Now, there is just one other clayworking center which is fast coming into prominence, and I want to hear just a word from that—away down South in the State of Alabama—Mr. J. W. Sibley. (Applause.)

ALABAMA'S TRIBUTE TO OHIO.

Mr. Toastmaster and Gentlemen:

I rise to offer a toast to-night to one of Ohio's sons, with whom most of us from the South differ as to certain matters of politics and economics—a man whose election we looked upon with dread and uncertainty to our fair Southland. Force bills, negro domination, financial slavery and many direful ills were prophesied to follow his inauguration.

Coming into office at a time of great crisis in our Nation's history, we see him exercising wise caution, forbearance and patience, when men's very souls were tried by the exciting events of almost daily occurrence. When the strain finally became unbearable and rupture followed, he proved himself the man of the hour, and took the helm of the ship of state in his own masterful hand and guided her safely to the haven of peace.

What could be more sublime than his appointment to the highest offices in the army men from the South who a third of a century ago lead the palladins of the South in fratricidal struggle against the valliant boys in blue, lead by his own brave and loyal self?

This offering of the olive branch from the victor was accepted in good faith. With great promptitude we see the youth of the South and many of the old Confederate veterans rally around the flag—

"Our beautiful star-spangled banner,
Long may it wave o'er the land of the free and the home of the brave."

One of the most touching incidents of the South's response to the call for volunteers was enacted at Nashville, Tenn. Governor Bob Taylor stood under the folds of the American flag, in the midst of a great throng of American citizens. Behind him stood a line of the old Confederate veterans wearing the worn and faded gray; in front a line of volunteers dressed in blue. The two lines confronted each other—not in war, but in peace; not in anger, but in love. The old captain in gray stood face to face with his son, a captain in blue, and in the name of the old heroes whose heads had grown gray in sympathy with the uniforms they wore, the Governor presented a sword to the young captain in blue from the old captain in gray, and a shout went up from a thousand throats when the youthful commander proudly said, in acknowledgement of the gift, "All that I can promise is that I will try to be as good a soldier as my father has been."

The old flag floated in the air with joy above the blending of the blue and the gray. It was the covenant of eternal brotherhood between the two sections of our country through all the years to come.

The dispatches from Manila tell us how gallantly the brave boys of the First Tennessee Regiment behaved in the recent battle.

You are all familiar with the magnanimous words of this beloved son of Ohio at the recent Peace Jubilee in Atlanta, and the responsive chord they struck in the heart of every true son of the South.

It was my pleasure to be present at his royal reception at Montgomery, Ala., the cradle of the Confederacy," and we will always cherish the generous sentiments expressed by him on that occasion.

I rejoice that it is my privilege, being a Democrat and the son of a Confederate soldier, to visit his home land and offer my tribute of esteem and admiration for the pure character, lofty wisdom and exalted patriotism of this noble President of our common country, the Hon. William McKinley, of Ohio.

Toastmaster: Gentlemen, we called a little while ago on a brickmaker who was characterized as a one-year-old. I want to begin a little further down yet than that. I want to call this time on an embryo brickmaker. He happens to be the one who is doing the experimental work for this Association. The hour is getting late. He will only have a word or two to say to you, but I would like to have you listen to Mr. Ross Purdy, the present incumbent of the National Brickmakers' Association's scholarship.

THE CLAYWORKERS' SCHOOL'S REPRESENTATIVE.

Mr. Purdy: In rising before this body of men I do it with fear and trembling. One reason is that I am an embryo. And, as this society has been called the parent and the National Ceramic Association the child, we come out before you an embryo, glad to invite you to our home and to our place of abode to see what we are doing. We wish to thank you, one and all, for your kindness towards us—for your magnificent tribute to our honored President, William McKinley (applause); but, above all, we wish to thank you for the tribute that you have paid this day and this evening to our beloved Professor Orton. (Continued applause.)

Toastmaster: Gentlemen, I might say, "and last of all came Satan." But I am not going to say that. I am going to say "last but not least," Mr. T. A. Randall. (Applause.)

THE FINALE.

Mr. Randall: We have heard from various sections of the country—from the North, South, East and West. There is one section that is well represented here to-night from which we have heard nothing, and I am going to tell a little story that a friend of mine relates in regard to a maiden lady from way down in Maine, which, I think, fits the case very well. She was born and bred in a little New England town a few miles from the coast. She had to work her own way along, and took in sewing; made the garments of the little ones as they came from one generation to the other; made the winding sheets of the older generations as they departed, living all the time what we call in Indiana a skimpy life. She never had more than enough of anything, but managed to keep body and soul together. She had few comforts, still fewer pleasures, and no luxuries. Her life was one long, unbroken line of economizing. If she bought a new garment she was sure to have to trim it with the finery from an old one, and, if she indulged in a new bonnet, it was decorated with the trimmings of that of last year. With her, life was a continual strife to make ends meet. And so it ran along until one day some of the young people, who had known Aunt Betty all their lives, were planning a summer excursion to the seashore, and one of them said, "Let us ask Aunt Betty to go with us. She has never been to the seashore, and she has so few pleasures," and so they took her with them, and all the way down they were speculating on what she would do and say when she looked out over the sea for the first time. And so, after they got off the train and went down to the coast, they all watched and listened, but Aunt Betty stood speechless. She walked along and sat down on the edge of one of the great rocks that line that jagged shore, and looked out over the wide expanse of waves. They waited in vain for her to say something. She seemed too full for utterance. Finally one of them said, "Well, Aunt Betty, what do you think of it? Isn't the view grand?' She heaved a sigh of relief, and said, still gazing seaward, "Well, thank God, I have lived to see something of which there is enough!" (Laughter.) Gentlemen, there is no end to the ocean, and I might say there is no end to speech-making whenever brickmakers get together. I have a little poetry here which was written by a gentleman from that same section of New England, which fits some of the cases referred to to-day. Now, if you will take the moral lesson attached to it, some of you may profit a little. It was written by Mr. B. J. Dunn, of Maine, and is entitled

BRAGGVILLE'S BRICK BOOM.

Bill Jones, sez he, "Here's clay,
And Braggville's booming night and day,
Brick from Mudville cost a lot;
Here's my fortune in this spot.
I'll make brick and undersell
Brick from Mudville. Might as well
Keep the money here, I guess,
So I'll sell brick a little less."

Sam Gould, sez he, "There's Jones—
Last year shiftless lazy bones;
Never known to earn a cent;
Rather move than pay his rent;
Gettin' rich now mighty quick,
Sellin' Braggville all her brick.
Try it on myself, I guess;
I'll sell brick a little less."

Jim Smith, sez he, "I swun—
See what Jones and Gould have done.
Just a little while ago
They was lazy, poor and slow.
Now they're in it, and you sh'd see
How wealthy both is bound to be.
Guess I'll join in their success;
I'll sell brick a little less."

Bragg, of Braggville, says, sez he,
"These are piping times for me—
When I get my plans all made,
And foundation's bein' laid,
I don't have to hunt for brick;
They come to me cheap and quick.
Brick men howlin' round me press:
'I'll sell brick a little less.' "

Braggville swelled at rapid rate;
Brickyards more than kept the gait.
Smith and Jones and Gould and Brown
Kept brick flying through the town.
And still the people, wondering, saw
Success defiant of all law
By this (that seemed not of success)
The "I'll sell brick a little less."

Green-grown flats by Braggville pools,
Green-grown graves of Braggville fools,
Tear-stained cash-books tell the tale
That ended in each bankrupt sale.
Smith and Jones and Gould and Brown
Have faded out of Braggville town.
Let this their epitaph express:
"I'll sell brick a little less."

(Applause.)

LETTERS FROM ABSENT MEMBERS.

T. A. Randall, Secretary, N. B. M. A.:

An old fossil "who lags superfluous on the stage" begs to make known to you Mr. F. H. Brockett, who is to all intents and purposes the Quinipac Brick Company. "The old dog likes his own door mat," and I'm the dog.

I commend to your friendly care Mr. Brockett, who is in every way worthy your consideration and a much better man than I am.

With best regards to all other old fogies, I am, as ever, your sincere friend,
S. P. CRAFTS.

New Haven, Conn., Feb. 6, 1899.

T. A. Randall, Secretary, N. B. M. A.:

Dear Sir—I had anticipated a great deal of pleasure at the meeting of the National Association of Brickmakers at Columbus this year, and had my plans all made to be with you, but a severe cold has kept me from participating in the good times had at these conventions.

I wish you would convey my regrets to the Association and extend a hearty invitation to all of the members to call upon me when in Chicago and visit our works at Porter, Ind., for which I will thank you very much. While I cannot be with you in body I am in spirit.

I inclose you $2 for membership fee for the year 1899. Hoping you will have a good Convention, and I know you will have a good time, I am, yours very truly.
S. S. KIMBELL.

Chicago, Feb. 8, 1899.

PRESENTATIONS.

The speech of Mr. Purington in presenting the gold watch, chain and charm to Professor Orton was quite unique. Prefacing it, as he did, with a splendid talk on technical education, which, by the way, in itself was one of the gems of the Convention, he was enabled to give a new cast to the ordinary run of addresses of this character.

The presentation of the gold badge to President Richardson by Professor Orton gave the former an opportunity to realize the difference between receiving and giving.

Mr. Gates, speaking with modesty characteristic of the Chicago people, presented the Association with a terra cotta gavel and gong, saying: "This bell is simply to ring at the Chairman's will, and is not in any sense a chestnut bell, for we never have any need of a chestnut bell in this Association." The gong and bell are unique and appropriate, and, like the donor, are both useful and ornamental. The gift is really novel and worthy of more than passing consideration. The accompanying illustration gives an idea of the bell's appearance. It is of dark red terra cotta, with the initials of the Association in white enamel, is some eighteen inches in height and is hung on a pointed terra cotta base of the same character, extending up into the bell, which, when struck by the gavel—itself a work of art, being made of the same material and prettily decorated—gives forth a clear, musical ring.

The President's table and the Terra Cotta Gong presented by W. D. Gates.
Photographed by J. Edson Clapp.

THE OHIO BRICK, TILE AND DRAINAGE ASSOCIATION.

One of the events of Convention week at Columbus was the reorganization of the State Association. But one session was held, when it was decided to meet in Columbus the second Tuesday in February, 1900. The following officers were elected: President, J. W. Everal, Westerville; vice president, W. C. Wilson, Brice; secretary, Ed F. Darnell, Grove City; treasurer, W. B. McClure, Warsaw.

THE CONVENTION ANNEX AS SEEN BY ONE OF THE ANNEXED.

AFTER THE BATTLE is over and peace has once more spread her wings over hallowed ground, the erstwhile combatants are inclined more or less to do a little retrospecting. We can see now where we missed a splendid chance of turning the enemy's flank, or a move that would have made defeat more decisive or a thousand other little things that we could have developed to our advantage, if—. Ah, well, we either lost or won, and it must be hoped that the lessons taught, alike by defeat or victory, may be well learned.

Taken as a whole the thirteenth annual Convention was a decided success, both intellectually and socially, and I fail to call to mind any other expressed opinion. In fact, it would be hard to find a flaw large enough to hang a complaint on. In one sense we were particularly unfortunate, and that is, in the absence of so many of our ex-presidents and prominent members. I am a little afraid to use the word "prominent" in connection with so democratic a body as we seem to be, so will qualify it and say "the more prominent." However, we missed them very much, and sincere and heartfelt were the hopes that Bros. Morrison, Miller, Testor and others would speedily recover their old-time health and energy and join us in many more Conventions.

As a body we were singularly fortunate in the possession of ample official material, even amongst our young men. (This was essentially a young men's Convention.) The name of Willard D. Richardson, our youngest President to date, will rank with any of his predecessors in the presidential chair. All the papers were ably presented and valuable, and the discussions evolved were more animated and pertinent than usual, and decided steps in the right direction.

—Where the Most Good Is Found.—

Along this line are the lobby talks, and right here is where the latent intellectual force of some of those of our silent members, who never talk in the Convention hall, is brought to the surface and communciated to the sympathetic listeners. I am reminded very forcibly of a remark by Bro. Purington at Pittsburg: "I apply my pump at every Convention, and get what information I can, and make it a point to go home wiser than I came." This is a point for habitual absentees to ponder on and carefully weigh when Convention season again comes around. The social features were as prominent as they were successful, reflecting credit on all concerned, and certain it is that the open-handed and big-hearted hospitality of the Columbus people, and especially of the University authorities, will long be gratefully remembered. Next to being a soldier in the late war stands the high honor of being born in Ohio, and it was rather startling to see so many who suddenly remembered the occurrence of her sons wearing with distinction the badge of the N. B. M. A. May their luster never be dimmed.

—In the Exhibition Room.—

The machine, kiln and dryer men and representatives of minor appliances were out in full force, and fully appreciated the ample provision made for their benefit in the exhibition of their specialties. After all, what would a Convention amount to if these men were not active participants, and, on the same line of reasoning, why should not as much pains be taken to secure them adequate space as is taken in any other Convention particular? From remarks dropped at various times I am sure the Secretary's efforts in this direction are heartily appreciated by those most interested. Chambers and the American Clayworking Machinery Co. were, as usual, well represented, both by perfect models and earnest workers, while Raymond, the "Wonder" Cunningham and Battenfeld & Morgan, Brewer of Michigan, Freese of Galion, the Leader, the Ohio Ceramic Engineering Co., and Fate of Plymouth, were all well to the front.

Dry presses were not as fully represented, but the ground not covered by Boyd, Simpson or Berg (Maroney) is hardly perceptible. The soft mud contingent were out in force. "Monarch" and "McDermott" are synonymous terms, and if you don't know all about it when "Mack" gets through you don't give him a chance. The Anderson Foundry and Machine Works were represented by the sweet-voiced tenor of the "Vaseliners." The Horton Manufacturing Co., Chicago Brick Machinery Co. and others were all prominent. In the dryers we saw the "Iron Clad," now owned by the Barron of Chicago, the "Standard," the "A. B. C." of Detroit, and Sharer. The kiln question was covered entirely from the "Peerless" up-draft to the Eudaly down-draft, the Haigh Continuous, Alsip up-and-down draft, the round "Pike" and the Lehman portable, accompanied by several types of special furnaces, notably the Graft and Swift. Our old friend Williams talked pulverizers, and Andy Harrington ably represented the Frost dry pans, as did McLaren the Pittsburg article, and Cox showed a line of cutting wire that should cut brick and expenses with equal facility. J. W. Hornsey and the Atlas Bolt and Screw Co. had a good thing in dryer cars which they were pushing along, and with Stevenson and Taplin & Rice in the sewer pipe interests, and Dunlap with his "perfect screen," made living a hustle for simple clayworkers. The clay journals were in evidence everywhere. Billingsley for the Clay-Worker, Manson for the Brick Builder, Kenfield for Brick and Hartwell for the Clay Record, did some effective missionary work. An unusual number of the old-timers were conspicuous by their absence. Martin, Stone, Woolley, Potts, Arnold and all the rest were missed, and themselves missed one of the happiest occasions of a busy year. They each and everyone have my sincerest sympathy, and I hope they will be more fortunate next year, and meet with us wherever the Convention may be held.

I cannot close these rambling reminiscences without voicing the many expressions of sympathy extended with feeling but without ostentation to the families and friends of our dear departed brethren, or the feeling of gladness that met those who had been very near to the portals of eternity. Personally, I was glad I was there, and hope to be at many more, and shall look forward to a recurence of those hearty hand clasps and expressions of brotherly feeling and good will that are notable features of our annual gatherings.

J. W. CARSON.

LIST OF MEMBERS N. B. M. A. 1899.

W. D. Palmer, Atlanta, Ga.
Atlanta Terre Cotta Co., Atlanta, Ga.
Chattahoochee Brick Co., Atlanta, Ga.
W. E. McCoy, Augusta, Ga.
Alton Paving, Building and Fire Brick Co., Alton, Ill.
Anderson Foundry and Machine Works, Anderson, Ind.
Woolley Foundry and Machine Works, Anderson, Ind.
George M. Stedman, Aurora, Ind.
Charles T. Harris, Alfred, N. Y.
D. S. Hildebrand, Asheville, N. C.
R. M. Imbody, Agosta, O.
H. B. Manton, Akron, O.
W. H. Rook, Akron, O.
J. B. DeHaven, Akron, O.
A. Hoover, Axline, O.
D. C. Cawley, Allegheny, Pa.
Xavier Wittmer, Allegheny, Pa.
C. H. Yohe, Alexander, Va.
W. H. Carter, Appleton, Wis.
W. F. Tallman, Beamsville, Ont., Can.
M. E. Jacobs, Berlin, Conn.
George F. Green, Berlin, Conn.
Donnelly Brick Co., Berlin, Conn.
S. H. Alsip, Belleville, Ill.
O. W. Dunlap, Bloomington, Ill.
George H. Drew, Blue Island, Ill.
Wm. Garig, Baton Rouge, La.
George R. Twitchell & Co., Boston, Mass.
Rogers & Manson, Boston, Mass.
Parry Bros. & Co., Boston, Mass.
Frank G. Evatt, Boston, Mass.
Philadelphia & Boston Face Brick Co., Boston, Mass.
J. Parker B. Fiske, Boston, Mass.
George M. Fiske, Boston, Mass.
Edward W. Emerson, Boston, Mass.
F. & A. Wehr, Baltimore, Md.
Jacob Klein, Baltimore, Md.
Chas. H. Classen, Baltimore, Md.
C. H. Cromwell, Baltimore, Md.
Baltimore High Grade Brick Co., Baltimore, Md.
Wm. H. Brush, Buffalo, N. Y.
George W. Schmidt, Buffalo, N. Y.
George H. Morton, Jewettville, N. Y.
F. W. Haake, Buffalo, N. Y.
Lewis Kirkover, Buffalo, N. Y.
S. C. Brush, Buffalo, N. Y.
Chas. A. Bloomfield, Brooklyn, N. Y.
John B. VanPelt, Brooklyn, N. Y.
W. A. Stephens, Batavia, O.
L. P. Battefeld, Bucyrus, O.
W. W. Reehl, Bucyrus, O.
A. R. Batley, Bucyrus, O.
George H. Bruns, Brecon, O.
R. R. Hice, Beaver, Pa.
T. M. Berkey, Bolivar, Pa.
Reese, Hammond & Co., Bolivar, Pa.
Henry Wynn, Branch, Pa.
John W. Sibley, Coaldale, Ala.
George O. Berry, Columbus, Ga.
Chas. Weaver, Casey, Ill.
George J. Walters, Chatsworth, Ill.
E. M. Pike, Chenoa, Ill.
D. V. Purington, Chicago, Ill.
W. D. Gates, Chicago, Ill.
Chas. Bonner, Chicago, Ill.
J. E. Eastes, Chicago, Ill.
Alsip Brick Co., Chicago, Ill.
A. F. Barron, Chicago, Ill.
H. J. Flood, Chicago, Ill.
S. S. Chisholm, Chicago, Ill.
George J. Hartwell, Chicago, Ill.
W. L. Jacoby, Chicago, Ill.
Hayt & Alsip, Chicago Ill.
Harrington & King Perforating Co., Chicago, Ill.

F. Lehman, Chicago, Ill.
S. S. Kimbell, Chicago, Ill.
John J. Moroney, Chicago, Ill.
P. L. Simpson, Chicago, Ill.
Tiffany Enameled Brick Co., Chicago, Ill.
Herman Thurow, Chicago, Ill.
B. C. White, Chicago, Ill.
Thomas Moulding Co., Chicago, Ill.
George J. M. Ashby, Chicago, Ill.
J. H. Gray, Chicago, Ill.
J. J. Gledhill, Chicago, Ill.
W. P. Gates, Chicago, Ill.
Melvin L. Emerich, Chicago, Ill.
Wm. Simpson, Chicago, Ill.
Fritz Wagner, Chicago, Ill.
H. B. Skeele, Chicago Heights, Ill.
W. H. Hoagland, Cayuga, Ind.
L. C. Besley, Council Bluffs, Ia.
I. C. Wheeler, Carthage, Mo.
Hervey Haigh, Catskill, N. Y.
M. E. Gregory, Corning, N. Y.
The Bonnot Co., Canton, O.
The Canton-Sparta Brick Co., Canton, O.
Carl Giessen, Canton, O.
C. W. Vaughn, Cuyahoga, Falls, O.
W. A. Eudaly, Cincinnati, O.
R. A. Stoehr, Cincinnati, O.
J. W. Hornsey, Cleveland, O.
J. M. Ervin, Cleveland, O.
J. N. Battenfeld, Cleveland, O.
A. P. Morgan, Cleveland, O.
Ohio Ceramic Engineering Co., Cleveland, O.
F. H. Eggers, Cleveland, O.
J. N. Kaufholz, Cleveland, O.
Daniel Duty, Cleveland, O.
Atlas Bolt and Screw Co., Cleveland, O.
Prof. Edward Orton, Jr., Columbus, O.
L G. Kilbourne, Columbus, O.
A. V. Bleininger, Columbus, O.
Wm. Cannan, Columbus, O.
Warren Wayne Ittner, Columbus, O.
Fish Pressed Brick Co., Columbus, O.
The Ironsides Co., Columbus, O.
J. A. Jeffrey (The Jeffrey Mfgg. Co.), Columbus, O.
G. S. Ettla, Clearfield, Pa.
C. W. Williams, Cameron, Tex.
G. A. Guignard, Columbia, S. C.
M. J. Hynes, Deseronto, Ont., Can.
J. G. Shea, Danville, Ill.
Leader Manufacturing Co., Decatur, Ill.
E. D. Mattes, Decatur, Ill.
D. H. Haeger, Dundee, Ill.
A. H. Schmittdiel, Detroit, Mich.
American Blower Co., Detroit, Mich.
George H. Clippert & Bro., Detroit, Mich.
John Hilton, Dunkirk N. Y.
W. H, Bushell, David City, Neb.
C. W Raymond & Co., Dayton, O.
W. C. Dennison, Delaware, O.
J. W. Wolfley, Delaware, O.
S. A. Williams, Darlington, Pa.
W. S. Ravenscroft, Daguscahonda, Pa.
F. W. M. Hammerschmidt, Elmhurst, Ill.
George Lill, Evanston, Ill.
H. C. Kleymeyer, Evansville, Ind.
George S. Cox, East Liverpool, O.
Thos. B. Anderson, East Liverpool, O.
C. G. Reese, Elizabethtown, Pa.
H. C. Dunn, Erie, Pa.
I. M. Justice, Erie, Pa.
Wallace Manufacturing Co., Frankfort, Ind.
Howard L. Hix, Frankfort, Ind.
Fort Dodge Clay Works, Fort Dodge, Ia.
T. C. Lundy, Farmingdale, L. I.
E. A. Poe, Fayetteville, N. C.
Edwin Brockway, Fishkill-on-Hudson, N.Y.
L. C. Dinsmore, Fayette City, Pa.
R. M. Matson, Falls Creek, Pa.
Franklin Paving Brick Co., Franklin, Pa.
W. S. Purington, Galesburg, Ill.
E. S. Gunnell, Galesburg, Ill.
Frost Manufacturing Co., Galesburg, Ill.
A. L. Smith, Greenfield, Mass.
C. C. Dyer, Gardner, Mass.
G. N. Dyer, Gardner, Mass.
Gomer Jones, Geneva, N. Y.
E. M. Freese & Co., Galion, O.
B. T. Place, Galion, O.
D. P. DeLong Glens Falls, N. Y.
Wm. Finnegan, Green Bay, Wis.
George N. Dickerson. Hartford, Conn.
Kleymeyer & Klute, Henderson, Ky.
Chas. H. Bray, Helena, Mont.
R. G. Eisenhart, Horseheads, N. Y.
Preston Brick Co., Hornellsville, N. Y.
A. H. Newton, Haverstraw, N. Y.
J. P. Stillwaugh, Hamilton, O.
J. W. Jones, Haydenville, O.
F. R. Carter, Highcliff, Wis.
T. A. Randall & Co., Indianapolis, Ind.
C. & A. Potts & Co., Indianapolis, Ind.
F. T. Melcher. Indianapolis, Ind.
John McKay, Indianapolis, Ind.
F. W. Butterworth, Indianapolis, Ind.
W. P. Hussey, Indianapolis, Ind.
Robert Elliott, Indianapolis, Ind.
Chandler & Taylor Co., Indianapolis, Ind.
J. C. Adams, Indianapolis, Ind.
Heinrich Reis, Ithaca, N. Y.
C. A. Morley, Jamestown, N. Y.
Alfred Yates, Johnsonburg, Pa.
Jefferson Brick & Tile Co., Jefferson, Wis.
John Connelly, Kensington, Conn.
W. L. Davis, Kensington, Conn.
Horace D. Payne, Kensington, Conn.
J. M. Leach, Kokomo, Ind.
E. W. Thorburn, Kingston, Jamaica.
J. W. Barney, Kansas City, Mo.
I. W. Pike, Keyport, N. J.
W. T. Hoblitzel, Keystone Junction, Pa.
J. W. Carson, LaPrairie, P. Q., Can.
The LaSalle Pressed Brick Co., LaSalle, Ill.
Wm. Hammerschmidt, Lombard, Ill.
G. T. Howe, Leeds Junction, Me.
L. Warstler, Louisville, O.
The A. Bonnot Manufacturing Co., Louisville, O.
Henry Martin Brick Machine Manufacturing Co., Lancaster, Pa.
W. S. Bowen, Little Falls, Wash.
Jas. W. Tester, Montreal, Can.
J. W. McMillan, Milledgeville, Ga.
O. T. Denison, Mason City, Ia.
Isaac Hardy, Momence, Ill.
A. Humphreys, Minneapolis, Minn.
C. F. Kaul, Madison, Neb
A. E. Burcham, Millville, N. J.
Martin L. Griffin, Mechanicsville, N. Y.
Marion Steam Shovel Co., Marion, O.
C. H. Carpenter, Martins Ferry, O.
J. J. Bishop, Memphis, Tenn.
J P. Cahoon, Murray, Utah.
David Stephens, Madison, Wis.
John Hopwood, Menomonie, Wis.
Ferdinand Vogt, Milwaukee, Wis.
T. B. Williams, Morgantown, W. Va.
E. S. Morse, New Britain, Conn.
R. N. Buell, New Britain, Conn.
R. Clifford Merwin, New Britain, Conn.
Wm. P. Felt, New Britain, Conn.
H. P. Shares, New Haven, Conn.
H. J. Wiley, New Haven, Conn.
J. Wheaton Stone, New Haven, Conn.
Ezra D. Fogg, New Haven, Conn.
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F. H. Brockett, North Haven, Conn.
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Orrin D. Person, New York City, N. Y.
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Robin Main, New York City, N. Y.
Meeker, Carter & Booraem, New York City, N. Y.
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Wm. Conway, Philadelphia, Pa.
Thos. J. Flood, Philadelphia, Pa.
Isaac Mattson, Philadelphia, Pa.
D. Chas. Murtha, Philadelphia, Pa.
T. B. McAvoy, Philadelphia, Pa.
Frank B. McAvoy, Philadelphia, Pa.
Wm. McCay, Philadelphia, Pa.
George W. Sharer, Philadelphia, Pa.
E. Webster & Nephew, Philadelphia, Pa.
Sankey Bros., Pittsburg, Pa.
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Phillips & McLaren, Pittsburg, Pa.
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Wm. Flinn, Pittsburg, Pa.
W. R. Hersperger, Pittsburg, Pa.
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W R. Cuthbert, Pittsburg, Pa.
Grant Dibert, Pittsburg, Pa.
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W. G. Titcomb, Providence, R. I.
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C. W. Kilborn, Rosenhay, N. J.
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Montello Clay and Brick Co., Reading, Pa.
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T. D. Potter, Springfield, Mass.
D. J. Curtis, Springfield, Mass.
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M. C. Heinemann, Saginaw, Mich.
John H. Qualmann, Saginaw, Mich.
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L. J. Howard, St. Louis, Mo.
H. A. Wheeler, St. Louis, Mo.
M. F. Williams, St. Louis, Mo.
J. M. Williams, St. Louis, Mo.
Otto C. Oehler, St. Louis, Mo.
T. P. Plumridge, St. Louis, Mo.
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C. H. Merrick, Syracuse, N. Y.
Sanford E. Loring, Syracuse, N. Y.
James L. Breed, Syracuse, N. Y.
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D. E. Pidgeon, Salem, O.
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Crescent Manufacturing Co., Shousetown, Pa.
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F. L. Phillips. Scranton, Pa.
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A. E. Morrison, Terre Haute, Ind.
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H. Brewer & Co., Tecumseh, Mich.
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J. E. Clapp, Vicksburg, Mich.
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Kendall & Flick, Washington, D. C.
John Miller, Washington, D. C.
W. A. Richards, Washington, D. C.
C. B. Pearson, Washington, D. C.
Washington Brick Co., Washington, D. C.
W. H. West & Bros., Washington, D. C.
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A. A. Wheat, Wheeling, W. Va.
T. W. Carmichael, Wellsburg, W. Va.
J. P. Norton, York Corner, Me.
A. O. Jones, Zanesville, O
Orville N. Townsend, Zanesville, O.
Zeeland Brick Co., Zeeland, Mich.

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1899—1900.

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John McCain, Denver, Col.
William Waplington, Philadelphia.
Hector McLean, Bridgeport, N. S.
James Taylor, Port Monmouth, N. J.

FRIDAY AT THE UNIVERSITY.

THE ENDING of the Convention was a happy one. The pleasure trips following the serious work of the Association have always been most enjoyable, and none more so than that to the University.

Promptly at the appointed hour, 9:30 Friday morning, a line of fine trolley cars drew up in front of the hotel and were quickly filled by the delegates and their ladies. Despite the extreme cold—the thermometer marking twenty below zero—the cars were warm and comfortable. In this, as in all other particulars, the local committee, under the direction of Kilbourne, Fish, Meehan and Orton, provided most thoughtfully for the comfort of their guests. The ride out to the University was hilarious to an extreme. Several of the elderly gentlemen developed unsuspected talent as entertainers. The comedians are not all on the stage.

Arriving at the University grounds the party marched through the snow in a column of twos to the Biological building, where the splendid specimens of extinct and existing animal life proved very interesting.

From the Biological building the crowd was conducted to the real mecca of the trip,

—Orton Hall, the Home of the School for Clayworkers.—

The treat of the occasion to the personal friends of Prof. Orton, we might as well say the entire membership, was the introduction to his venerable father, who seemed most delighted to greet the visitors. He delivered an interesting lecture on a few of the conspicuous features of the museum. After listening to his voice, which is still clear, though he is now nearing the end of a busy, useful life, spent almost entirely in the service of the State as geologist and the University, where for many years he has been a pillar of strength and a recognized authority on all matters in his department, notwithstanding the disparity in years the marked resemblance of father and son as they stood side by side, one the picture of vigorous young manhood, the other of ripe old age, with snow-white hair and venerable mien, was the occasion of much comment.

First we were shown into the commodious classroom, thence to the basement, through the finely equipped laboratories and into the clayworking departments, where the professor explained the various details of the school work and exhibited the apparatus and machinery which is used in the experimental work. The ballmills, washing machines, clay presses and other devices familiar to potters were examined curiously by the brick men, to many of whom they were new and novel. In the brickmaking department it was quite different. Here they were right at home among the auger machinery, dry pan, cutting tables, repress, rattler, etc., each ready for practical operation in the ordinary way familiar to all. The method of handling the samples of clay, the way the brick were made and the process of testing were explained in detail by the professor himself. The use of pyrometers and cones was of particular interest, and the test kiln was examined critically. An hour slipped away very quickly, and we were then marched to the great armory and gymnasium, a splendid, massive structure, equipped with the latest paraphernalia for physical development of every sort. The sporty of the stern sex took kindly to the ladders, swinging poles, parallel bars, etc., several attempting feats of strength which they might have accomplished easier thirty or forty years earlier.

At one end of the spacious hall was an appetizing spread of white linen and china, and when Prof. Orton gave the signal that all was ready the chairs were quickly filled, and again the sweetly familiar clink of table ware mingled with the hum of conversation. The gastronomic exercises were continued uninterruptedly for an hour, and then as Prof. Orton tapped for attention everybody settled themselves with a satisfied air and drank in the stream of oratory which flows as freely and as constantly from the brickmakers as an artesian well from its unseen source.

Prof. W. W. Lord, the dean of the engineering faculty, in a few well chosen words, apologized for the absence of the President of the University, which was unavoidable, as explained in the following letter:

> Dear Professor Orton:
>
> At the luncheon to-morrow, given to the members of the Association who are our guests, be good enough to explain that my absence is because of engagements made nearly two months ago, which cannot be set aside, and to express my regrets that I cannot add my own welcome to that which they will receive from yourself and others, and cannot tell them how highly I esteem their work and their efforts to add to its intelligent effectiveness by organization and by careful preparatory training. Very cordially yours. JAMES H. CANFIELD.

Prof. Lord, acting toastmaster, welcomed the guests to the University in a very hearty manner, explaining that it was a new experience to welcome to the University a great national body as the guests of the University. He dwelt on the importance of special education, asserting that the time has past when a college education was only necessary for those entering the learned professions. "Ministers always went to college; lawyers always went to college; doctors always went to college, and the rest of the world sometimes went to college. But this means that you gentlemen, representing a great national industry, have determined that the men you want in your workshops, the men you want in your factories, the men you expect to direct your industries, must go to college, that they may bring to your work the scientific training of the college, the effects of expert training in the handling of the apparatus necessary to keep the industry up to date with the industries of the world in the application of science. As I said at the beginning, this is a striking occasion, the first occasion where I have ever seen a great national industry represented at the University as a part of its constituency. On behalf of the University, on behalf of the Board of Engineers, I bid you a cordial welcome to the laboratories, halls and workshops of the Ohio State University." Prof. Lord was loudly applauded at the close of his address, and then called upon President Richardson, who responded in a fitting manner, thanking the directors of the University on behalf of the National Brick Manufacturers' Association for the distinguished consideration shown its members, and assuring them that the scholarship in the School of Ceramics would be maintained, and added: "I look forward to the day when, through the efforts of the clayworkers of the United States, and, perhaps, by individual benefactions of some of these prosperous clayworkers, there will be situated upon this campus a building, large and commodious, and built entirely of clay and devoted exclusively to the Department of Ceramics of this University. It is only by this means, gentlemen, as Dr. Lord has said, that the clayworker can be lifted to that position in the industrial world to which he is entitled because of the important bearing of clay products upon the comfort and well-being of mankind." (Applause.)

Prof. Lord then in turn introduced Mr. Paul Jones, a member of the Board of Trustees of the O. S. U.; Mr. D. V. Purington, Chicago; Mr. W. A. Eudaly, Cincinnati; Prof. Edward Orton, jr.; Mr. J. C. Adams, Indianapolis; Mr. F. H. Eggers, Cleveland; Mr. L. E. Barringer, a member of the ceramic class, and W. D. Gates, of Chicago, each of whom spoke entertainingly, the visitors praising the University and its officials for the good work being accomplished and for the open-handed hospitality and attention shown the N. B. M. A.

"Three cheers and a tiger" for the Ohio State University, proposed a visitor, and they were given with an energy that made the welkin ring—even the ladies joining in.

Again wraps were donned and the party proceeded on a tour of inspection through the various buildings, photos of which were shown in the January Clay-Worker. The mechanical departments were revelations to those who had not previously visited them, and it is safe to say our members have a much better opinion of industrial education than ever before. Every department of the University is splendidly equipped, and there is little doubt but a number of the visitors who have sons to educate will be represented in that institution in the years to come.

The day was well spent and pleasantly, so much so that one veteran of the Association who, though he has never missed a Convention, has not, as a rule, participated in the Friday junkets, said that in the future he would not hurry home as quickly as possible after adjournment as he had done in the past, but would from this on stay to the very last. If a vote had been taken we opine that all who braved the severe cold to spend a day at the University would have declared unhesitatingly that it was the most instructive and enjoyable day of Convention week.

THE LAST CONVENTION OF THE SEASON.

The Iowa and Nebraska Associations' Joint Meeting at Sioux City Wednesday and Thursday, March 1 and 2, '99.

The Programme and Other Particulars.

THE IOWA AND NEBRASKA brick and tilemakers have pooled issues this season so far as their state conventions are concerned, and will have a union meeting at Sioux City Wednesday and Thursday, March 1 and 2.

As will be seen by the programme, which follows, arrangements have been made for a busy and profitable convention, and the Sioux City clayworkers promise that visitors will be well entertained. A large attendance is anticipated, and a good time is assured. Special arrangements have been made with the Mondamin Hotel, which will be headquarters, and where a banquet will be tendered the visiting clayworkers by the local committee Wednesday evening.

Enrollment and report of members.

Selection of Committee on Resolutions.

Address of welcome by Mayor Quick, Sioux City, Ia.

Annual address by President, C. J. Holman, Sargents Bluffs, Ia.

"Ups and Downs of Clay Industry." Robert Goodwin, Des Moines, Ia.

"Future Outlook of Drain Tile." J. D. Kaney, Fairfield, Ia.

General discussion, "Our Experiences as Clayworkers, 1898."

"The Quality of Product as Affecting the Increase of Consumption of Common Brick." G. A. Wind, Cedar Falls, Ia.

"Most Profitable Way of Manufacturing and How to Obtain Better Brick." J. B. McHose, Boone, Ia.

"Most Successful Way of Governing Laboring Men." Carl Neise, Burlington, Ia.

"Hindrance or Experience in Clay Goods in Foreign Countries." J. M. Ashby, Chicago, Ill.

"The Manufacturing of Drain Tile." Hon. T. E. Haines, Altoona, Ia.

"Practical Benefits of Our Association." W. W. Lewis, Williamsburg, Ia.

"Hollow Blocks." B. E. LaDow, Chicago, Ill.

Address. Speaker to be supplied.

"Care and Prevention of Scales in Boilers." J. M. Harris, Des Moines, Ia.

"Best Method of Extending Our Trade." Speaker to be supplied.

Poem, question box and report of Committee on Resolutions.

Report of Secretary and Treasurer and election of officers.

C. J. HOLMAN, Pres., Sargents Bluffs, Ia.
ROBERT GOODWIN, Secy., Redfield, Ia.

A large delegation will go from Chicago via the Illinois Central Railroad, leaving Chicago Tuesday, the 28th, at 3:30 p. m. Those who can are cordially invited to join the party. A good time is in store for all who make the trip.

CONVENTION ECHOES.

"By Far the Best Trade Convention Ever Held."

My Dear Randall—After a weary wait of nearly three hours in the beautiful Union Depot at Columbus the Chicago contingent finally found themselves in a comfortable Pullman rolling northward. The hour of arrival was sufficiently late to warrant attention to business, but I concluded it too late to attempt to mend a week so badly broken, and so made 4800 Kenwood avenue my destination. Here I have been holding a supplementary convention and indulging in a rehearsal of the acts and words of that larger one which finished its labors yesterday afternoon. I have endeavored to impress upon my audience of one that it was by far the best trade convention ever held in this country, and flatter myself that success has attended my efforts.

If the readers of the Clay-Worker could have listened to my enthusiastic eulogies I am sure that further efforts would be superfluous, and that it would be unnecessary for me to add that I have enjoyed the Thirteenth Annual Convention of the N. B. M. A. more than any previous one. It must be as apparent to the others of "The Old Guard" as it is to me that the association tree is beginning to bear fruit, goodly to the eye and palatable to the taste. I do not dare particularize, but no one who listened to our new members in their interesting papers and suggestive discussions can question the value of intelligent experiments, based upon scientific theory, and henceforth progress in clayworking must be by inductive methods rather than by arbitrary dogma.

It has been my ill fortune to miss all but one or two of the closing day exercises, and for that reason I am scarcely competent to make comparison, but it is difficult to imagine anything but a higher temperature could have added to our pleasure on Friday. The trustees of the Ohio State University have placed the clayworkers of the United States under renewed obligations. (See report of Friday's proceedings.)

I must not close this echo of Convention week without a word of appreciation for "mine hosts" of the Great Southern. With the weather clerk pushing the mercury far down into the bulb and the entire United States shivering in the blasts of winter, we were warm and comfortable.

I am a little famished for the want of sleep; otherwise I am ready for the next Convention. Yours truly,

Chicago, Feb. 11, 1899. D. V. PURINGTON.

A "FRIEND" FINDS FRIENDS AT COLUMBUS.

My Dear Randall—On behalf of at least one lady who attended her first Convention with a good deal of timidity, permit me to express a word of appreciation for the many courtesies shown us at Columbus. It could not have been a nicer, cleaner Convention nor greater kindness shown one who was a stranger in the ranks. Brickmakers, kiln men, editors and others with their wives are no longer names, but tangible living clay substances to be looked up to and properly reverenced.

Friday's trip to the University was a revelation in more ways than one, but then she did not know Father Pike's possibilities for fun as some of us do.

Success was stamped on every phase of the Convention, and those on whom the burden fell have cause for congratulation.

Yours sincerely, J. H. CHAMBERS.

Philadelphia, Feb. 13, 1899.

IMPRESSIONS OF THE CONVENTION AND THE CONTION CITY.

What a fortunate thing it was, with the mercury 19 to 21 degrees below zero, that we did not have to go out of the hotel to attend the sessions. Two-thirds of the members seemed to have established a rule that no one was expected to go to bed the same day he got up. The rotunda was crowded at midnight, and everybody was as animated as if they had just arisen from a refreshing night's rest. The cheerful warmth of the hotel could not at all times hold some of the strong men of the far East and far West. They came back loaded with enough brass in their overcoat pockets to start a foundry. A near-by bowling alley was the attraction for others, and a Chicago brickman, who never drank a drop or saw a bowling alley, made the highest score against the athlete of Galesburg and the giant of Blue Island.

Gates, the inimitable, was the favored of all. He said just enough and always the right thing in the right place and at the right time. That banquet speech will go down into history. No one complained of Purington and Eudaly talking too much. In fact, they didn't get the chance.

The preservation of the organization is assured, and the "thirteenth" will go down in the archives as the beginning of a new era.

Listen to the voices as memory recalls the short, clear-cut remarks of Engineer Jones, of Geneva, N. Y., and thinking of him will you not always be reminded of his discovery of four feet of sawdust as a foundation of a brick pavement. Bleininger's paper, Prof. Wheeler's of St. Louis, Lovejoy, Harris of St. Paul, and Alfred, New York. Then there was Tester of Montreal, Fiske of Boston, Bloomfield of New York, spirits of the present age and brimful of fun, business and science as you would have them. Last, but not least, were the indefatigable workers of the Columbus committee, Prof. Orton, L. G. Kilbourne and Mr. Fish. To Prof. Orton we are all, ladies and gentlemen, indebted to the pleasant day at the University; not a soul but learned something of either himself, his neighbor or his ancestry. An adjourned convention was held Saturday, when Eggers of Cleveland, Classen of Baltimore, Morse of New Britain, Fiske and Evatts of Boston, Wolfley of Delaware, O., and Plumridge of St. Louis, met Kilbourne of Columbus as host, and started for Union Furnace, fifty-seven miles from Columbus, where the brickyard is located. There they were met at the station by drivers and sleighs filled with fresh straw and well supplied with blankets, and were driven to the works of the Columbus Brick and Terra Cotta Company and conducted through from the stock sheds, filled with the choicest ornamental face brick ever produced or ever put on the market. The Eastern men opened their eyes in wonder at what they never dreamed of having been accomplished in the face brick line by the dry press process. The Guthrie kilns were something of a wonder as well. A ride of three quarters of a mile under ground through the clay mine was a novel experience, but the old mule brought them all back in safety, although the rear coach did jump the track once in awhile. A lunch at Logan, and back at Union Station by 3 p. m., completed the day.

Thinking of the Union Station at Columbus, wonder why they put the building 400 feet from the street? It might not appear like a long walk on a balmy day, but for a man with two grips and an umbrella, and thermometer ten degrees below zero, it's about a mile to the street cars from the depot proper. The only reason the writer could think of was the company ran down their own line of hacks and carriages and brought them in the depot entrance, excluding all others.

Many pleasant acquaintances were found among the ladies. and the Convention has been made a great feature to them, as it is to the men. As one lady expressed it, "What a pity to think of the good times we are going to have for a whole year, and then have it pass from our lives into the past in three days!"

The "thirteenth" has come and gone. No one regrets the money it has cost him, or the time spent. That something is to be learned is unquestionable, and you, reader, who only read the reports in cold type, miss half the benefits or more. There can be no improvements suggested on the Convention just passed, except, possibly, one. Keep the machinery and exhibit room farther from the Convention hall, or build a non-conducting partition between them. A YEARLING.

THE PALM AWARDED TO COLUMBUS.

My Dear Randall—Returning home from the Convention I spent most of the following week at the Scottish Rite Temple, attending the yearly convocation, and now after two weeks' reunions I am almost normal again. The Columbus reunion of the N. B. M. A. is, in my estimation, a historic one. Never has the Association elected a President who so well deserved and earned the position as Mr. W. D. Richardson, and the presentation of the gold badge to him is convincing evidence of the high esteem the members have for him. "Time!" Prof. Edward Orton, jr., was so surprised that when he came to "time" it had been a dream that he had been a five-yearling rather than a Klondiker. I have been a stickler that Cleveland had the best Convention since my brief membership in the Association, but confess I give to Columbus the first prize now. No Ohio State University in Cleveland. I shall ever remember the procession of ladies and gentlemen through the various departments and buildings of the Ohio State University, and in particular the courteous treatment extended to our ladies and gentlemen by the officials, professors— in fact, every one connected with the University, students included. I believe in this, I voice the sentiments of all those who attended the Convention. It must be a great gratification to Messrs. Randall, Orton, Kilbourne, Fish and others who carried out the arrangements for the Convention and entertainment. Yours sincerely, F. H. EGGERS.

Cleveland, Feb. 18, 1899.

"THE NEW YEAR REALLY BEGINS WITH THE N. B. M. A. CONVENTION."

My Dear Randall—This Monday morning again finds us back at our posts, with working harness on and in the traces, hooked to the old load which we find just where we left it before going to the Convention, with the exception that everything is buried in snow, owing to the very severe blizzard that has been so universal throughout our section of country.

We are now trying to pull ourselves together and get in shape for the year's business, as we never feel that the new year has rightly begun until after the Convention and we are in touch with our fellow-craftsmen. Some way we feel stronger and more courageous after grasping the hand of old friends so sturdy and kind like those we meet at the N. B. M. A. Conventions, to say nothing of the mutual and kindly exchange of experience in some quiet corner, which same was more noticeable at our recent Convention then ever before. Many such buttonhole talks could be seen in different parts of the hotel until long past midnight. It is in these friendly gatherings we get our best things of the Convention.

Of the Convention proper we cannot say enough. Each one we attend seems better than the previous one. Nor will we fully appreciate this meeting until we have carefully digested the many able papers presented, together with their respective discussions, so hurry out your February issue of the always welcome Clay-Worker. We take it for granted it will contain full proceedings.

To yourself, Mr. Secretary, we wish to express our appreciation and thanks for the commendable manner in which you conducted the gift to Prof. Orton, the selection of which so fittingly expressed the esteem in which he is held, and which was so adroitly presented by our own Purington.

To our absent Empire State clayworkers we would say you have missed a rare treat, and hope you will give a better account of yourselves in the future. In conclusion we extend our gratitude to all to whom it is due for the very able manner in which the Convention was managed and the uniform courtesy extended to all.

Not forgetting the kind people of Columbus, who so royally entertained us and who we shall long remember, sincerely yours, FRED S. NAUGLE.

Warners, N. Y. Feb. 13, 1899.

A TENDERFOOT'S IMPRESSION.

My Dear Randall—As a "tenderfoot," who has just returned from his first meeting of the N. B. M. A., permit me to express my gratitude and appreciation of the hospitality of our Columbus members and friends, of the feast of good papers and discussions you provided for us, but, above all, for the opportunity to meet and enjoy the society of so many members. I have for years enjoyed and derived much benefit from the contributions as papers or discussions through the Clay-Worker, but have never realized how much more I have missed from not being present to enjoy that which no publication can ever furnish—the advantages of personal contact with such a wide-awake, cordial aggregation of clayworkers. Such an opportunity to exchange "shop talk," to compare notes and experiences, and to enjoy the quiet talks with fellow-clayworkers during the numerous opportunities between sessions should not be missed by any progressive member of the craft, and those poor, benighted fossils outside the N. B. M. A. are to be pittied —not condemned—for their small caliber and diminutive statue in not being able to appreciate the advantages of not only being members, but of attending the N. B. M. A. meetings. Last, and by no means least, are the social advantages of basking in the sunshine of such members as that great bundle of sympathy and humanity known as "Gates," and to meet his "better half," the force of that subtle influence which is felt but not seen in the famous "buttonhole talks;" to see the old war horse D. V. charge on the enemy and rout the noisy manufacturers in one round, and to listen to the clear-cut, well-directed eloquence of Jesse Adams, and enjoy the sparks that fly when "Honest Anthony" and the irrepressable Eudaly are to intensify the discussions, and when are their interests ever lacking in the welfare of the Association? But allusions to the Columbus meeting could not be closed without a tribute to that unselfish, untiring, indefatigable enthusiast in the cause of the clayworkers, Prof. Orton, jr. His extra efforts and warm hospitality in making the Columbus meeting such a success has been frequently and gladly shared by other members at previous meetings of the Association, but his valuable contributions to the clay industries, his special efforts in behalf of problems that have directly confronted the N. B. M. A., and his original, pioneer labors in so successfully inaugurating the first school for clayworkers in this country, received but just recognition in the handsome gold watch and chain that his friends had the pleasure of presenting him as a permanent memento of the successful Columbus meeting. Yours cordially,

St. Louis, Mo., Feb. 12, 1899. H. A. WHEELER.

EN ROUTE HOME—SNOW-BOUND BUT HAPPY.

My Dear Randall—Snow-bound and tired, I must not delay longer a word complimenting you on the success of the Columbus Convention. The handsome treatment of the Columbus Board of Trade, the indefatigable efforts of Prof. Orton and Mr. Kilbourne to entertain, and the excellent management of the details by yourself, have combined in making a most successful and long to be remembered meeting. With congratulations, I am sincerely, FRANK G. EVATT.

Harpers Ferry, W. Va., Feb. 14, 1899.

"ONE OF THE BRIGHTEST AND PLEASANTEST EVENTS OF LIFE."

Friend Randall: Upon my return from the Convention I find your letter of the 4th informing me of the condition of affairs at Columbus—that both Orton and Kilbourne positively refuse to be a candidate for the presidency, and that in all probability I would be selected for the place; that I will not be permitted to decline, etc., etc., and assuring me of your cordial support and that of my many friends in the Association.

I am very sorry that the letter did not reach me before I started for the Convention, that I might have made proper preparation in the quiet of my own sanctum for the duties that devolved upon me, and thus perhaps have won some credit as a presiding officer and as an extempore speaker. To be sure, I had learned from other sources that the Columbus people desired to name me as their candidate, but I intended up to the last to refuse to allow my name to be presented, believing that my defective hearing would seriously interfere with the smooth running of the Convention, and cause me much embarrassment. But I am sure that had I received your letter I would have accepted your decision of the matter as final, and have prepared myself accordingly, since I have been so accustomed to be governed by you in association affairs that I would not have known how to do otherwise.

Now, do not suppose that I think lightly of the honor of the presidency of the N. B. M. A. On the contrary, I assure you that there is no honor that could come to me that I value more highly, but I have never aspired to the position, and never would have sought it, realizing as no one else can my unfitness for the place. But now that it has come to me, and the burdensome and much-dreaded duties of the Convention are over, and my mistakes and shortcomings as a presiding officer will soon be forgotten, I can say that I will always cherish and regard as one of the brightest and pleasantest events of my life the Convention of the N. B. M. A. at Columbus, where I had the honor of being President, and the beautiful gold badge that was fastened upon my coat on that occasion by Prof. Orton will be preserved and treasured up among the most precious mementoes of my career, and will be transmitted with pride as an heirloom to my children. (Now, don't laugh and spoil that period. If I can't leave my name in the world any other way I shall with such assistance as I may secure, some day adopt a child and bring him up as a brickmaker. For some one to share my honors would you advise an advertisement in the Clay-Worker or correspondence upon bricks after the manner of the ancients, as described by Gates?)

I have been going over my part in the Convention mentally, and the speeches which then came from me so timidly and awkwardly, and so failed to express my thoughts and emotions, now in fancy flow easily and boldly, eloquent in word and action, moving the Convention to admiration and applause. Now, were it not that the words I uttered are to appear in your journal among the proceedings of the Convention I might become to believe that I actually did make the fine speeches that now come to me as an aftermath. But, however dissatisfied I may be with the manner I acted my part, I am proud of my associates, I am proud that we have in our association men upon whom we can always rely to make good speeches either upon the floor of the Convention or at the banquet table; men whom we confidently feel will not be outshown either in good looks or in good words by any host or guest who may honor us, be he business or professional, private citizen or Governor. Moreover and especially am I proud to have been the President of a Convention which, on the whole, must be pronounced the most successful ever held by our Association, and the like of which in some delightful features we shall not see again for many a year. How I pity those poor brickmakers who could not or would not join their fellow-craftsmen in such a pleasant and profitable gathering.

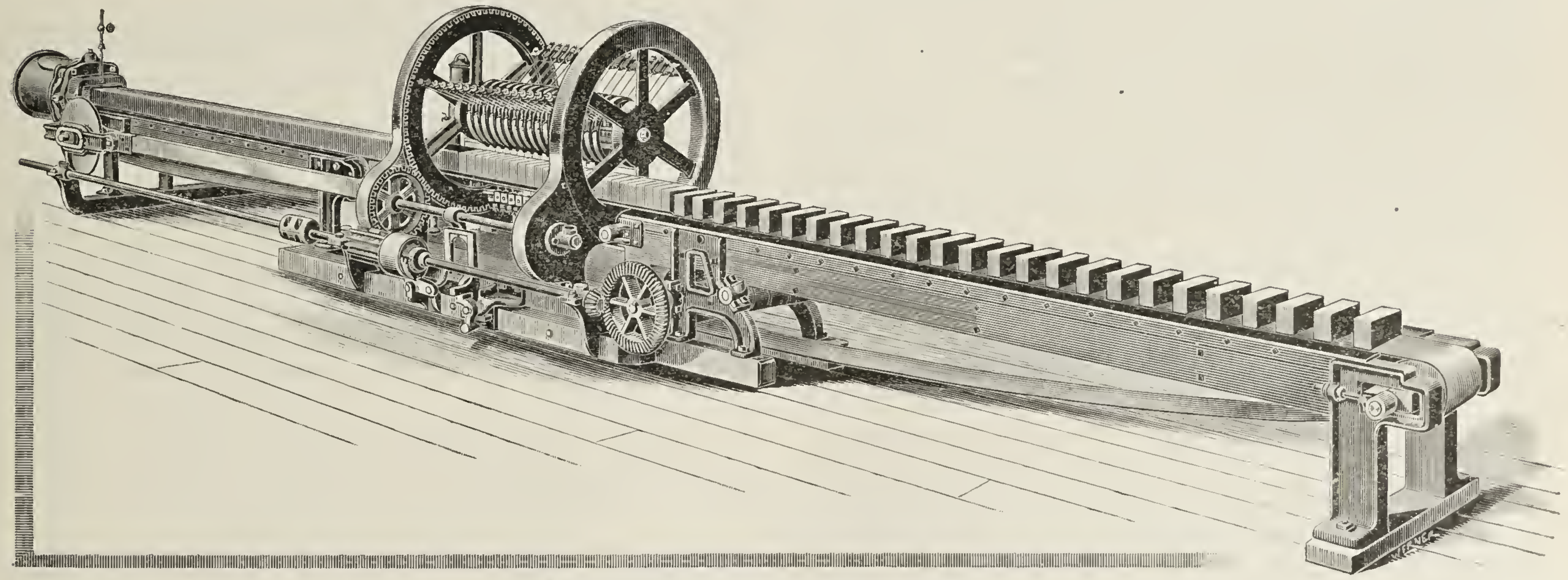
With best regards to all, especially to the honorary life members, I am, very cordially, W. D. R.

Shawnee, O., Feb. 15, 1899.

A NEW AUTOMATIC CUTTER FOR SIDE-CUT BRICK.

An Important Improvement—Side-cut Brick with Smooth Edges.

WE INTRODUCE to our readers for the first time a new brick cutter, invented and perfected by E. M. Freese & Co., of Galion, O. It is an important and valuable improvement, consisting of a new automatic cutting apparatus, which avoids roughing the edges of side-cut brick, so serious an objection to cutters of the usual type.



A New Rotating Cutter for Side-Cut Brick.

Besides producing brick with sharp, straight and smooth edges, this apparatus has many other advantages, such as great simplicity and durability, freedom from slip belts, tensions, springs or parts requiring adjustment.

The clay does not propel the cutting wires. Broken wires are easily replaced without stopping. No possibility of clay wedging, as only one side or thrust bar is used.

All movements are slow, positive and exact, and all brick are cut square, straight and of the same thickness, whether the speed of the clay be fast or slow.

Its capacity is ample for any brick machine.

We judge that this improvement will be found to merit the attention of brick manufacturers.

Further particulars will be found in the advertisement of E. M. Freese & Co. on another page of this issue.

PACIFIC COAST NEWS.

AS YET THE RENEWED activity in the clay industry, which is promised on the coast, has not set in, but the manufacturers are very hopeful, and feel quite encouraged with the present indications. Throughout the coast large projects are being considered, and improvements of all kinds are contemplated, which, of course, will mean much to the clay industry. Prosperity certainly seems to be in sight. San Diego, Cal., for instance, since the new steamship line has commenced operating between there and the Orient, has been offered a number of propositions for starting new enterprises there. The town has a big future, and will rapidly build up. All along the line both north and south projects are being considered. It is expected that lots of money will be put into circulation, and the brick and clayworkers are very sure of getting their full share of it. The crop prospects are very fair at present, so, taking all things into consideration, the outlook is encouraging.

The Remillard Brick Co., of Oakland, Cal., seems to think prospects are very good, providing we get enough rain.

A new companuy has been organized in the City of Mexico, Mexico, under the name of the National Fire Clay Co., for the purpose of manufacturing fire brick, and the sale of that article in connection with fire clay, sewer pipe and all kinds of clay specialties. The works will be located at Santiago, and work is to be commenced at once. The machinery for the company has been ordered from the United States, and will arrive in a short time. The company will handle all grades of imported fire brick, and will represent several prominent American firms for the sale of such clay products as they do not manufacture. Following are the officers of the company: L. J. Neale, president; C. C. Merritt, jr., vice president and manager, and A. W. Cockerton, secretary and treasurer.

The Sucia Island Sanstone Co., of Seattle, Wash., has been incorporated with a capital stock of $100,000.

A deposit of genuine red paint is claimed to have been discovered on Thunder creek, about three miles from Baker, Skagit county, Washington. The deposit produces the best quality of mineral paint by means of the simple process of burning it. The discovery was made by H. E. Edgar, and he and his partner will develop it.

The Walla Walla Brick and Pottery Manufacturing Co., with a capital stock of $50,000, has been incorporated to conduct a general brick and pottery business at Walla Walla, Wash. A deposit of clay of excellent quality has been found near that place. J. L. Jones, William O'Donnell and others are the directors of the company.

August Luteness has brought suit against the Washington Brick, Lime and Manufacturing Co., of Spokane, Wash., for over $15,000 damages for personal injuries alleged to have been received while in the employ of the company, and for which he says the company is liable.

A $40,000 brick structure is to be erected at Portland, Ore., by the S. Smith estate.

The brickyards and works now in the western part of Butte, Mont., will probably be removed in the spring from there about a mile further to the southwest. One reason for the proposed change is that the deposit of clay at the present location is practically exhausted, and that there is a large deposit at the new location.. When moved the plant will be enlarged.

SUNSET.

AMERICAN CERAMIC SOCIETY.

Under the above title a new Association was organized at Columbus Feb 7, one which will deal with the science of ceramics in a thoroughly serious and technical manner. The first sessions were productive of much good, and the foundation was laid broad and deep for future work that will place the ceramic art on a higher plane and give its votaries a standing among technicists to which they are justly entitled. A number of learned gentlemen delivered addresses of signal value, some of which we hope to give in these columns later on. The permanent organization resulted in the election of the following officers: President, Prof. H. A. Wheeler, St. Louis, Mo.; Vice President, Ernest Mayer, Beaver Falls, Pa.; Secretary, Prof. Edward Orton, jr., Columbus, O.; Treasurer, Stanley R. Burt, Cincinnati, O.; Managers, W. H. Zimmer, Wheeling, W. Va.; Samuel Geysbeek, New Brighton, Pa., and Chas. F. Binns, Trenton, N. J.

PHILADELPHIA TRADE NEWS.

—Transfer of Thomas H. Flood's Yard to T. B. McAvoy's Sons.—

Ere this passes from the printers' hands the old and well-known plant of "Chaplain" Flood and his son will have passed into the possession of and will be run hereafter under the head and management of Thomas B. McAvoy's sons, comprising A. C. McAvoy as general manager, and Thomas B., jr., and John C. as assistants. The plant, which is located on old Front street and Nicetown Lane, covers about thirty acres, and comprises in its make-up a six-mold Carnell soft-mud machine with a 30,000 daily capacity; a Huyett & Smith fan dryer, 50 by 100, with ten tracks, and six ten-arch Dutch kilns of 185,000 capacity each.

New muscle and new energy will be put in now by the stalwart and alert McAvoys, and, in place of the 12,000,000 to 14,000,000 turned out annually by the Floods, under the new regime this is expected to be nearly doubled. With the introduction of a new Chambers machine, and several improvements and repairs, this yard will start up and be in full swing ere the principal factors have brushed the dust of Columbus off their clothes.

—Another Important Move—

Has been made through the efforts of these same McAvoys. This time we travel into our recently acquired colonial possessions at Porto Rico. Under the incorporated charter, the new company, comprising Frank McAvoy, N. J. Mitchell, A. G. Alsop and M. Randall, have received their timber and clay lands at Ponce, Porto Rico, and there will devote their efforts toward real estate investments, building of street railways, general contract work and brickmaking, the latter being a dead-sure investment, with no possibility of suffering any active competition. Captitalized at $1,000,000, with the home office situated at Broad and Chestnut, heads and brains controlling, this venture may well be assured of immediate success.

Following are the officers: Dr. L. S. Filbert, president; Frank McAvoy, manager; N. J. Mitchell, secretary and treasurer; A. G. Alsop, resident manager, Ponce, Porto Rico.

—The Vitrified Brick Trust.—

This last promises to go through. At this moment of writing the matter is in the hands of an able promoter, and, with the assurance of 90 per cent. of the V. B. men, who have expressed their willingness to come in, there is scarcely a possibilty of a flaw or obstacle to prevent a speedy culmination. It behooves the men going in to be reasonable in their demands, and, if so, we shall soon hear of another trust that will knock distrust all to smithereens.

MITSCHKA.

BOARD DELIVERY CUTTING TABLES—A QUERY.

Editor Clay-Worker:

I am thinking of a board delivery side-cut brick table, but I understand they are not in general use. I would like to know why. What are the essentials of an ideal board delivery cutting table? What are the objections to those on the market? I think a free discussion of this subject by men of experience will be interesting and profitable to brickmakers in general. Yours,

A. N. XIETY.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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Ten copies, " "	15.00

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☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXXI FEBRUARY, 1899. NO 2.

CURRENT COMMENT.

"The best Convention yet," appears to be the general verdict. This is extremely gratifying to all concerned, and especially to the Columbus committee.

* * *

The reader who has gone through the preceding pages can not but be impressed with the idea that the members of the N. B. M. A. are an exceedingly fine looking set of gentlemen.

* * *

One must observe, too, that a majority of the faces are not only handsome, but comparatively young looking. The much desired "new blood" is manifest both in the appearance of the body and in its work as well. As an organization we have reached a sturdy manhood.

* * *

We can congratulate ourselves on this status without in the least reflecting on the virility of the older members, a number of whom are as capable and willing to lead the van as in years gone by. Their enthusiasm is just as keen, and, while they welcome the younger element, theirs is the controlling spirit. 'Tis well.

* * *

The writer of the paper, "What I Don't Know About Brickmaking," probably did not know that it is a finable offense for any member to make reference to the technique or practice of brickmaking as it existed previous to the birth of Christ. The Secretary, who was fined $5, was the responsible party, for he should have notified Mr. Morrell of this rule.

* * *

One of the best evidences of the earnestness of the members of the N. B. M. A. is their persistence in attendance at all sessions. No session is too long for the faithful, with no signs of impatience, sit attentive till the speaker declares the Convention adjourned. Evidently they would go without their meals, if necessary, rather than miss a single speech. This attentiveness has characterized the members from the very first Convention. There is no gainsaying their staying qualities.

* * *

The meeting was well saturated with young men. Through the young members come enthusiasm and new ideas. The "mossback," if any there be, under such influence puts on a new coat and hides the moss. He wisely refrains from opening his mouth, lest he "put his foot in it," and in a little time he becomes acclimated, as it were, and, by absorption, acquires knowledge and is a better brickmaker and a more progressive citizen than he otherwise would be.

THE BUSINESS SIDE.

The paper on "The Trade Situation," which was to have been delivered by Mr. Barkwill, of Cleveland, did not materialize. However, the subject was handled satisfactorily by ex-President Eggers. The tendency of the Convention to give additional consideration to matters of business and to the commercial side of brickmaking is a step in the right direction. Both Mr. Eggers and Mr. Plumridge formulated material which, properly considered, cannot but be of value to the business men of the Association.

THE POWWOW.

This strong social function, which has done so much to cement the personal ties of the N. B. M. A., was of more than ordinary interest. The general character of speeches was high, full of wit and a spirit of good-fellowship. For the first time in the history of the Association there was present the Governor of a great State. Governor Bushnell showed a familiarity with the clay resources of the State of Ohio which it would be well for the executives of other States to seriously emulate. It is men of this character who can do much for the material advancement of the people. Governor Bushnell made a splendid impression on all who heard and met him. Professor Orton was called upon at the last moment to preside over this function, and surprised those who knew him best by the admirable manner in which he did the honors of the occasion

THE SPIRIT OF PROGRESS.

The N. B. M. A. has taken another step. The development of the Association has been gradual and constant. At first there may have been those who questioned its utility. Certainly there were those who were not broad enough to see much of anything in it. But after its years of work, after all it has done, who is there who will question its practical value to the brickmakers of the country and to the general commercial welfare of the people at large. At first there appeared to be some limit to the scope of this Association, but now, with added knowledge, the field seems to be illimitable. Many years ago papers were written which seemed to exhaust the subjects of which they treated. Now all such work and almost all details appear susceptible of new light. The last Convention was merely another step in the advance movement.

TESTING PAVING BRICK.

One of the interesting features of the Convention was the paper of Mr. Gomer Jones, City Engineer of Geneva, N. Y., exploiting a new method of testing paving brick. As he aptly put it in the general discussion, it is the duty of the brickmaker to know why his brick are good brick and how to make them so; that it is the duty of the engineer not to determine these questions, but to establish the fact that the brick really are good brick. Mr. Jones is not an iconoclast as to what has been done by the National Association in the matter of testing brick. He does not question the methods which have been adopted by this Association. His method is not a substitute; it is merely supplemental to the method of testing paving brick now in use. Anything which will enable the engineer to assure himself as to the real character of paving brick is an addition to the material welfare of the clayworker. It is to the interest of responsible paving brick manufacturers that every poor brick, as well as every good one, be known in advance. For help in this direction we are indebted to Mr. Jones.

A FINE LOOKING BODY.

No one who attended the Convention failed to be impressed with the fine appearance of the ensemble. Contrast this body of producers with one representative of the time when chemistry, literature, science and art were not the dominant factors in the production of brick. Now it is brains, not brawn. The difference shows in the personnel of the Convention. The members bear the stamp of intelligence, good manners—a body of well-groomed men. Would the brickmaker of thirty years ago, under any circumstances, have taken his wife to a convention? We think not. Her office would then have been in the kitchen. Let us congratulate ourselves, men and women alike.

CLAY AS ROOFING MATERIAL.

It occurs to us that the roofing question is one which is between the people and the clayworker. Not that the clayworker knows all that may be known on this subject. Far from it. But there is hardly enough business in this line, excepting for a few producers, to afford educational opportunities for a large number. There is no reason why this should be true. Clay roofing material is as superior for a roof as is brick for a wall. There is no more flimsy material than shingles, no material more destructible by fire than slate. There is no material which has had so satisfactory a test through time and circumstance than clay tile, yet there is no material which is used in so small quantities for roofing material as this superior product. One reason for this, as we see it, is that the manufacturers of this country have not seen it worth their while to make a low priced or plain roofing material. For the most part, it has been made for the most expensive structures, and not those of moderate cost. The high priced structure, the palatial residence, the costly public building, is the rare structure. The moderate cost building is common, and it is through this kind of building that the roofing tile must make its advance. It is through such a source that the public will be educated to the value of roofing material.

ADVERTISING A NECESSITY.

Not only is the Clay-Worker primarily an educational magazine, but it is, in a sense, a sales agent. It brings the producer and the consumer together. We are certain that a large quantity of the goods of the manufacturers would not be sold but for the medium which we present as between the seller and the buyer. The manufacturer of clayworking machinery cannot go to his customers because he does not know where they are. We help him to find them. The advertisements tell what the producers have to sell. Some one reads about it, writes to the producer, and then our business ends. The railroad, the telephone, the telegraph and the printing press are great business auxiliaries. There was a time when the railroad was not much in use. Neither the wire, nor the printing press. But if a man stays in business he has to use all of these things. If he doesn't use the printing press he will not use either of the others to any great extent long. A man who undertakes to cut down the cost of doing business by not selling so much goods, so that he won't have to pay so much freight, is about as wise as the man who refuses to talk to his customers through the medium of the press in advertising. One way to meet a customer is through the medium of the press. You tell him what you have to sell. You give him points of your product in as clear and concise a way as you know, and if you have a good thing and present it right, it will be sold. But if he doesn't know that you have it to sell he'll write to the other fellow.

The man who does not use every means of making a sale that is known to the science of business is in as bad a shape in the end as the clayworker who does not avail himself of up-to-date inventions and appliances. Advertising is one of the products of science and invention. The men who do the most business in the clayworking world, the ones who sell the most machinery, are not those who do the least advertising. They use every means known to the science of business to get business.

THE BADGE OF MEMBERSHIP.

The souvenir badge presented to the visitors by the Columbus brickmakers is certainly one of the handsomest of the entire series, as the reader may see by the accompanying illustration. The medal is of bronze and shows a bust of Christopher Columbus on one side and an allegorical group on the other representing Progress (a beautiful female figure), leading the brickmaker from the drudgery of primitive ways to pleasanter paths through knowledge. It is handsomely executed, and suspended by a chain from a bar of the same metal, with a miniature flag as a background. It was in great demand by all who saw it, and several of the members expressed the opinion that it was the prettiest souvenir of the sort they had ever seen. The local committee very generously gave those left over to the Secretary, to be distributed to members who were not at the Convention. Those desiring them are requested to advise the Secretary at once. In this connection we wish to urge those who have not done so to renew their membership at once, else the Secretary must drop their names from the list of members.

CONVENTION ECHOES.

The sympathies of the entire membership went out to Mr. J. Y. Bassell, the genial secretary of the Columbus Board of Trade, who was to have officiated as toastmaster at the banquet, but was prevented from doing so by a most distressing accident, which resulted in the death of his son.

The Battenfeld-Morgan Company, Cleveland, O., was in the mouths of all the visitors Wednesday, having distributed neat celluloid toothpicks to them as they passed from the dining hall. The picks are an improvement on the old style quill, and, as they bore in diminutive letters the name and address of the Battenfeld-Morgan Company, were an excellent ad.

The Jeffrey Manufacturing Company, Columbus, O., did their share of entertaining Convention week. Many of the delegates visited their factory, an extensive plant, covering several acres, where the process of manufacturing all kinds of link belting, conveyors for all kinds of materials and various devices for miners' use such as coal carriers, etc., was inspected.

AS OTHERS SEE US.

My Dear Randall—Inclosed find check to pay for thirty copies of the January Clay-Worker, which were received in good shape.

We are now anxiously awaiting the February number, containing report of the Convention. Now that the excitement is over and our friends and visitors have left, we feel a little lonesome, but the memories of Convention week are very pleasant.

It is gratifying to know that the brickmakers always create a favorable impression wherever they go, so you may be interested in the accompanying letter, which bears out the statement, often heard before, that members of the N. B. M. A. are gentlemen and welcome guests always. The gates of Columbus are open to them at all times. Sincerely yours,

Columbus, Feb. 18, 1899. L. G. KILBOURNE.

—A Nice Compliment.—

Dear Mr. Kilbourne—We are pleased to acknowledge receipt of your favor. We herewith return you bill receipted, and take this opportunity to thank you most cordially for your interest in our behalf during the meeting of the N. B. M. A. Also to compliment your Association upon the high standard of intelligence and gentlemanly bearing of all those whom we had the honor to entertain during that meeting. It is, indeed, gratifying to have as guests in our house the class of gentlemen which your Association brought us. Yours to command, etc.,

FOOR & KINNEY, Managers Great Southern Hotel.

USE YOUR BRAIN EQUIPMENT.

If you have brains, thank heaven for them and put them to work, says Fame. There are other things in the world that are important, and brains alone make a man hard and thin; but, when you have said your worst, brains are a very useful element in business economy.

These reflections are suggested by the fact that the rank and file of workingmen are so ignorant about their own specialty. Hire a carpenter to make a box, and the chances are ten to one there will be some mistake in it unless you watch every step. The man who sweeps your office, the girl who folds your circulars, the printer who sets your type, all can be helped to do their work more easily and artistically and satisfactorily by a hint from a person who does none of these things, but who brings brains to apply to the problems involved in these branches of industry. Of course, there are artists in every trade, before whose specialized knowledge the outsider, though he be king of Wall street in his own right, must be respectfully silent. But why are there so few of them? That is the mystery. The man who can see in a flash how things ought to be done, though he has never put hand to the work, can not easily understand the stupidity of the man who has put his hand to nothing else all his life long. But it is simply a matter of brains; and he who is fortunate enough to come into life with that "extra" added to his equipment must expect to have demand upon it.

AMERICAN CLAY MACHINERY MANUFACTURERS INVITED TO EXHIBIT THEIR PRODUCTS IN LONDON.

Editor Clay-Worker:

I should esteem it a great favor if you would be so kind as to mention the fact that I am holding my biennial Building Trades Exhibition at the Royal Agricultural Hall from April 26 to May 6 in next year.

This exhibition will undoubtedly be the finest one of the kind ever held in this country, as already, some five months before opening, the whole of the ground floor of the hall (which, by the by, is the largest of its kind in the kingdom) has been entirely taken up with exhibits.

All the great clayworking firms in this country will be represented, and amongst other new firms which have taken space I may mention such as Doulton & Co., Lambeth; Stiff & Sons, Lambeth; Farnley Iron Co., Leeds; Messrs. Gibbs & Canning, Tamworth; Messrs. Howson & Sons, Staffs; Messrs. Oates & Green, Halifax; Woodward & Co., Swadlincote, and Wedgwood & Sons, Staffs.

In addition to this we are having the latest machines at work in brickmaking, woodworking, etc., and the exhibits comprise every section of the building trade.

As the exhibition is an international one, perhaps some of your readers may like to be represented, and I can assure them that no better opportunity could possibly be found of introducing to the brickmakers of this country the clayworking machinery and appliances of the new country.

H. GREVILLE MONTGOMERY,

London, W. C., England. Prop. British Clay-Worker.

HOW TO SET AND BURN DRY PRESS BRICK.

Mr. T. A. Randall & Co., Indianapolis, Ind.:

Dear Sirs—We have been readers of your Clay-Worker for several years, and have received much good information from it. We are making brick by the dry-press process on a Fernholtz press. We are making a very nice brick, burn in common clamps, and our shale shrinks so much in burning that it is hard to get an even burn. We cannot burn out close on heads, [illegible] is where we want information. We have a good many broken arch brick—more than we can get rid of. I will tell you as near as I can how we are setting them. We make first course loose, about five-eighths inch apart; on top of this we put them in pairs, two together; leave opening between four—that is, two together and then the opening, and two more; then comes tight course, and then comes two more courses same as before, and then another tight course; then we commence our projection courses; project about one inch on each course for seven courses, which closes the arch with the seventh course, which makes it fourteen courses high. Now, we would appreciate it very much if you could give us any new idea or way to set them so they would not break on us so much in the arch.

We make them out of a very hard, blue shale, shrinkage of about twelve inches in a forty-course kiln. Now, dear Clay-Worker, if some of your experienced writers will tell us how to overcome our trouble, we will be very grateful. Respectfully,

CARTER & ROLLINS.

Paris, Tex., Feb. 7, 1899.

Mr. H. E. Mack, who removed from Philadelphia to St. Louis a year ago to accept the position of second vice president of the Hydraulic Press Brick Co., has resigned that office and will return East, and Mr. F. W. Middlekauf, who succeeded Mr. Mack at Philadelphia, will do the same now at St. Louis.

CONVENTION ECHOES.

The Vaseline quartet, all of whom, it is said, eat fox meat for breakfast and bathe daily in vaseline, is composed entirely of machine men. They entertained the Powwow with a fine example of machine-made poetry and song.

Mr. Charles Bray, of Helena, Mont., was the first regular delegate to arrive at Columbus, and there never was a minute that he wasn't strictly in it. He is very fond of music, distinguished himself as a member of Vaseline Quartet, and astonished several of the members by his skill as a bellringer. He comes to the Conventions to have a good time, and he has it, deservedly, for he travels further, at much greater expense of time and money, than any other member of the Association.

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2 1 c THOMAS, care Clay-Worker.

H. P. engine; two 70 H. P. boilers; dry pan; pulleys, belting; blacksmith outfit; trucks, pallets, fire brick; 4 ft. grate bars; pump. Used little.
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"TABLE OF ANALYSES OF CLAYS," Alfred Crossley, 1.00
"VITRIFIED PAVING BRICK," H. A. Wheeler, E. M., 1.00
"PRACTICAL FARM DRAINAGE," J. J. W. Billingsley, 1.00

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Indianapolis, Ind.

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If so bear in mind the fact that no road offers better facilities for reaching Sioux City from Chicago than the

ILLINOIS CENTRAL RAILROAD
CENTRAL MISSISSIPPI VALLEY ROUTE

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Through Pullman Buffet Sleeping Cars.
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A. H. HANSON, General Passenger Agent, **Chicago.**

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- No. 3 Perfection Dry Press.
- Nos. 1 and 2 Perfection Hand Presses.
- Clay Separators.
- A-1 Automatic Cutting Table.
- A-2 Automatic Cutting Table.
- Imperial Automatic Side Cutting Table.
- Unique Board Delivery Automatic Cutting Table.
- Triumph Side Cutting Table.
- Novelty Board Delivery Cutting Table.
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- Single Geared Pug Mills.
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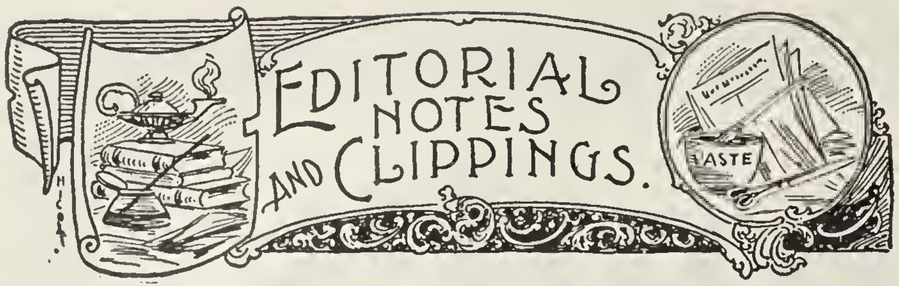


EDITORIAL NOTES AND CLIPPINGS.

J. B. Menely will start up a new brickyard at Rantoul, Ill.

Nelson & Roguish, of Ponca, Neb., have opened up a new brickyard.

A. Brewster & Son will build a new brick plant at Pine Bluff, Ark.

The Fulton Enamel Brick Co. will erect a brick plant at May's Landing, N. J.

Z. Wickersham, of Dyersburg, Tenn., contemplates locating a brickyard at Ripley, Tenn.

M. Pilroy & Son, of Ingraham, Ill., will open up a brick and tile plant at West Genoa, Ill.

Joseph Glasgow, formerly of Auburn, Neb., will engage in the manufacture of brick at Peru, Neb.

A company has been organized at Troy, N. H., to make fireproofing. George L. Pearson is manager.

A. Neal has purchased the brick plant at Gananoque, Ontario, and will operate same in the spring.

Mr. Boyle, a brick manufacturer at Mammoth Springs, Ark., is contemplating establishing a brick plant at Malden, Mo.

A. Rodgers has leased the old brickyard of J. H. Whitis, at Macon, Mo., and will put the same in shape to make brick at once.

An encaustic tile works will be erected at Converse, Ind. R. M. Kenny is interested, and can give information concerning same.

The brickyard of H. C. Dodson, St. Michaels, Md., has been purchased by C. Hope, who is getting everything in shape for operation.

A new brick plant, in which A. J. Swanson, of Lindborg, Kan., is interested, will be established at Salina, Kan., in the near future.

The Ohio Brick and Coal Co. has been incorporated at Cleveland, O., for the purpose of mining and manufacturing clay and fire clay products.

E. Lampitt and E. L. Conklin have purchased the brickyard of Michael Bros., at Pekin, Ill. They will operate under the firm name of Lampitt & Co.

Mr. Wm. Wassell, of St. Louis, Mo., contemplates establishing a large tile factory at Little Rock, Ark., where he has found a good deposit of clay.

The McLean County Brick Co. has been incorporated at Bloomington, Ill. H. M. Fleming, J. C. Glimpse and H. D. Spencer are the incorporators.

N. Martin and J. McCarthy have formed a partnership under the name of the Central Berkshire Brick Co., and will manufacture brick at South Lee, Mass.

Jacob Dupper, an employe of the Crown Fire Clay Co., at Canal Dover., O., was instantly killed by the caving in of a clay bank where he was at work.

Several of the Trenton, N. J., potteries have been busy of late getting large orders of crockery ready for shipment to Manila for the United States soldiers.

J. W. Younger, an old resident of Wichita, Kan., died at his home in that city recently. He had been engaged in the manufacture of brick for a number of years.

A party of Newport, Va., capitalists will establish a brick plant at Williamsburg, W. Va. Mr. Pilkinton, of the latter place, can give information regarding same.

John L. Purple, manager of the Columbia Brick Co., at Lancaster, Pa., has completed negotiations with the Standard Dry Kiln Co., Indianapolis, for one of their dryers.

The Lonyo Brick Co. has been incorporated at Detroit, Mich., with $30,000 capital stock. Albert and Louis Lonyo, John A. Mercier and Stephen Stuve are the incorporators.

The Kingman Plow Co., at Abbeyville, Ill., will erect a brick works for the purpose of manufacturing brick for the immense plant they will put up the coming summer.

Robert Griffith has purchased Mr. Koch's interest in the brick and tile factory at Brighton, Ill. The firm name will hereafter be Dash & Griffith, instead of Dash & Koch.

The Pontiac (Ill.) Coal Co. will establish a brickyard in connection with their coal business, as they have discovered there is a good quality of fire clay on their property.

The New England Fireproofing Co. has been incorporated at Newburyport, Mass., with a capital stock of $100,000. It will manufacture brick and other fireproofing material.

The Kingsland Pressed & Fire Brick Co., of Kingsland, Ark., has filed articles of incorporation. The capital stock of the company, of which E. R. Buster is president, is $50,000.

R. Emerson, of Malden, and Mr. Flanders, of Boston, have purchased the brickyards of T. Fecteau and E. Gilbert at Plaistow, N. H., and will operate the same the coming season.

A good quality of clay has been found at Port Huron, Mich. A company in which Wm. Jenks, of the Jenks Shipbuilding Co., is interested will probably be organized and a brickyard opened up.

The Crown Pressed Brick Co., of Ormstown, Quebec, have recently booked an order calling for over a quarter of a million of brick for an electric power house on the Loulanges canal, at Croteau.

The Attica Brick and Tile Co. has been incorporated to manufacture brick and tile at Attica, N. Y. The capital stock is $20,000. The incorporators are P. W. and J. C. Griffith and A. D. Whitney.

City Engineer Andrews, of Albany, N. Y., is quoted by the Hudson (N. Y.) Register as saying in his anual report that vitrified paving brick is the best material on the market for paving streets.

J. F. Kimler, of Williamsport, Md., has discovered a very fine deposit of clay on his West Virginia farm. He has had the clay tested, with very good results, and will establish a plant ere long.

J. F. Townsend and others, of Akron, O., have purchased the plant of the Royal Clay Co., at Urichsville, O. The new owners will make a number of improvements and put the plant in operation.

The S. A. Bumgarner brick plant of Paola, Kan., has been sold to Wm. Swartz, of Wea. Mr. Bumgarner will manage the plant for Mr. Swartz, and will commence work as soon as the weather will permit.

Nelson, Wash., needs a good brickmaker to establish an up-to-date brick plant. They have good clay close to the city, and a good demand for brick. The town would probably give a bonus to the right party.

A stock company has been organized at Eden, Ala., for the manufacture of brick. The concern will be known as the Eden Manufacturing Company, of which H. M. Lany is president and L. C. Lewis secretary.

Oscar F. Bledsoe, Shell Mound, Miss., would like to communicate with a good man who wants to go into the brick and tile business. He says there is an unlimited demand for both brick and tile in that section.

An expert of Zanesville, O., has been testing clay at Galliopolis, O., in which J. K. Powell, of the latter place, is interested. The clay is said to be of excellent quality, and steps will be taken to have the same developed.

The New Jersey Brick Co. has been incorporated to manufacture plain and ornamental brick and terra cotta. The works will be at Florence, N. J., and the main office at Trenton, N. J. Geo. E. Fell is to be general manager.

The Diamond Vitrified Brick Co., recently incorporated at Portland, Ore., has purchased the old plant of the Jensen Paving Co., at Russell, Clark county, Washington, and will immediately begin the manufacture of street pavers.

The firm of Kilkenny & Davies, brick manufacturers at Utica, N. Y., has been dissolved by mutual agreement. Mr. Davies will continue the business, having as an associate Wm. Weaver. The new firm will be known as Weaver & Davies.

The fire brick works of Harbison & Walker, Pittsburg, Pa., located at Grampian, Clearfield county, Pennsylvania, was totally destroyed by fire the night of February 7. The loss is estimated at $25,000, which is partially covered by insurance. The origin of the fire is unknown.

Thomas McCarthy, superintendent of the New York Brick and Paving Co., Syracuse, N. Y., was struck by a train on the New York Central Railroad near Warners, N. Y., and instantly killed. He, with another gentleman, was sitting on the track,

CONTINUED ON PAGE 188.

The "Monarch" BRICK.... MACHINE,

Unquestionably the

Leading Horizontal "Soft=Mud" Machine.

More in use than other of its class.

◆

The

"Iron Quaker" Brick Machine

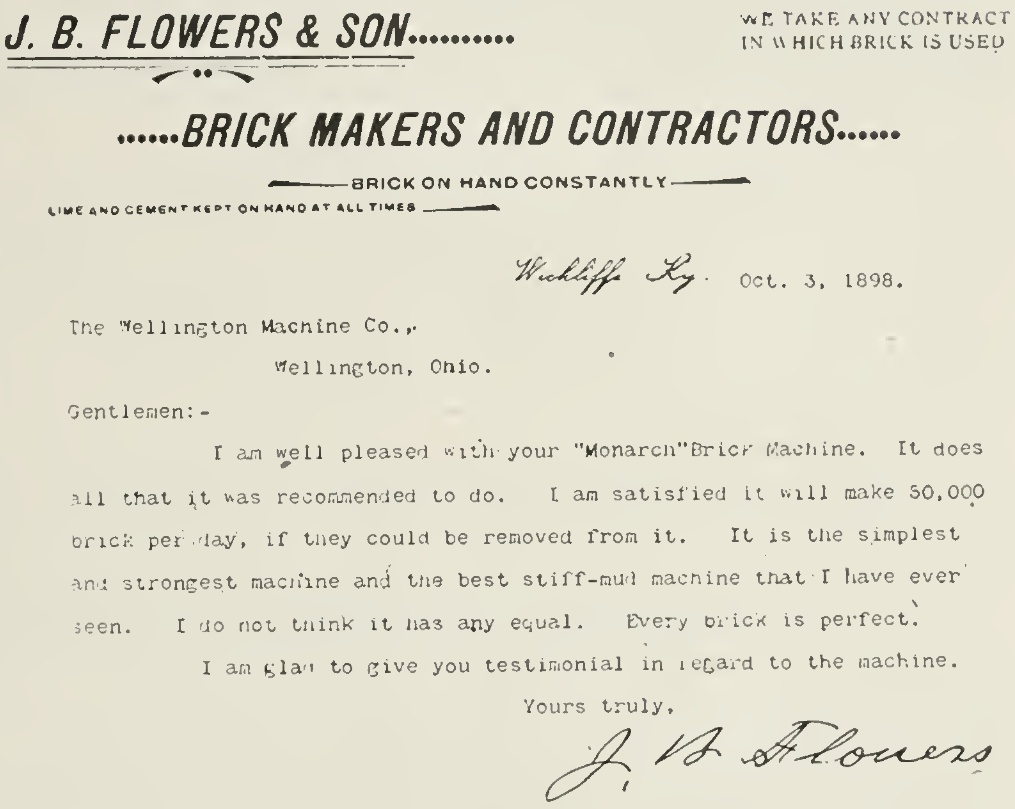
Unquestionably the

Leading Upright "Soft=Mud Machine.

Horse and Steam Power.

More "Quaker" Machines in use than any of its class.

HERE'S ANOTHER GOOD ONE.



J. B. FLOWERS & SON..........

WE TAKE ANY CONTRACT IN WHICH BRICK IS USED

......BRICK MAKERS AND CONTRACTORS......

BRICK ON HAND CONSTANTLY

LIME AND CEMENT KEPT ON HAND AT ALL TIMES

Wickliffe Ky. Oct. 3, 1898.

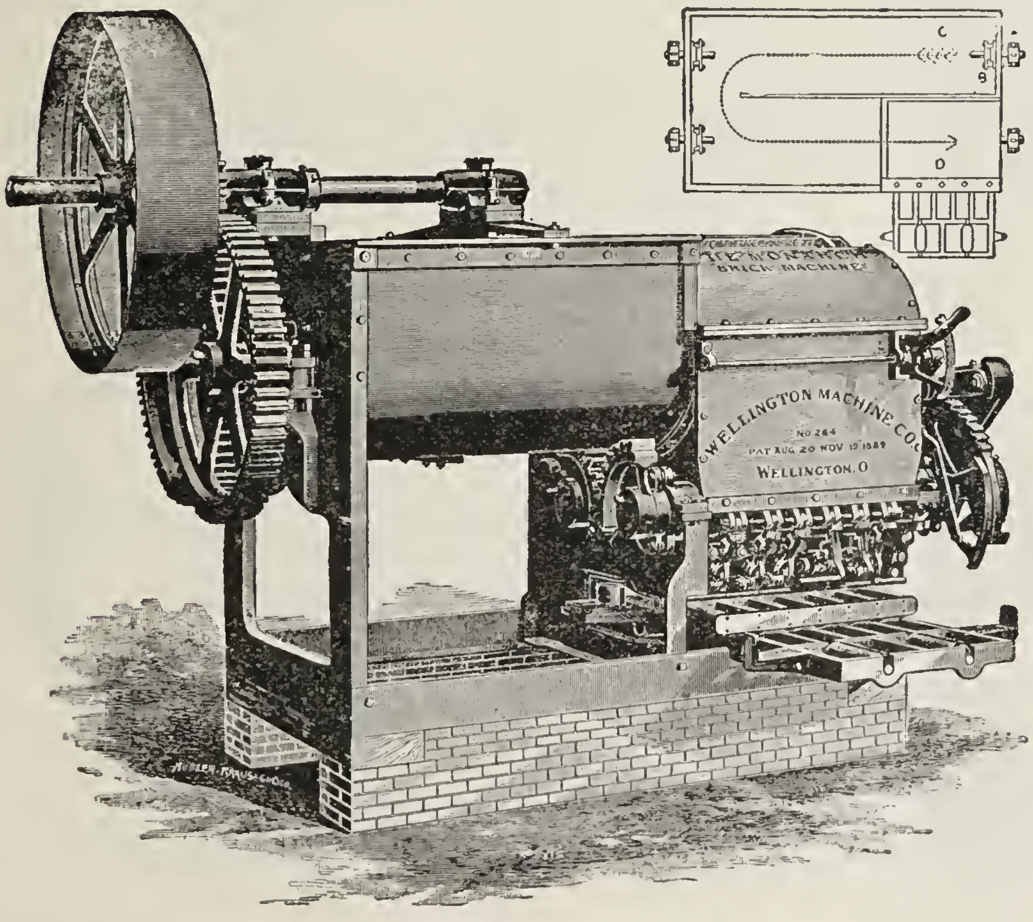
The Wellington Machine Co.,
Wellington, Ohio.

Gentlemen:-

I am well pleased with your "Monarch" Brick Machine. It does all that it was recommended to do. I am satisfied it will make 50,000 brick per day, if they could be removed from it. It is the simplest and strongest machine and the best stiff-mud machine that I have ever seen. I do not think it has any equal. Every brick is perfect.

I am glad to give you testimonial in regard to the machine.

Yours truly,
J. B. Flowers



We have the Best and Lowest Priced

Mold=Sander.

◆

No one else makes . . . .

BALL-BEARING TRUCKS and BARROWS.

The Greatest Improvement in small articles ever put upon a brickyard.

◆

ALL OTHER AUXILIARY TOOLS, MACHINES AND SUPPLIES.

The Wellington Machine Co.,

Send for Circular. Mention the Clay-Worker *WELLINGTON, OHIO.*

EDITORIAL NOTES AND CLIPPINGS—Continued.

and, their attention being attracted by a passing freight on another track, they failed to see or hear the passenger train coming on the track they were on. Mr. McCarthy leaves a wife and three children.

H. M. Morrison, senior member of the Athens Pressed Brick Co., Athens, Tex., died there Jan. 30. Mr. Morrison was sixty-one years old, and had lived in Athens forty-three years, twenty years of which he had been engaged in the brick business.

The Walla Walla Brick and Pottery Manufacturing Co. has been organized at Walla Walla, Wash., by Wm. O'Donnell, D. P. Oppenheimer, J. L. Jones and others. They have a capital stock of $50,000, and expect to manufacture brick on a large scale.

The Brown Brick Co., of Rockford, Ill., held its annual February meeting, declared a dividend of 6 per cent. and elected officers as follows: President, Tom Ennett; vice president, George Wilson; treasurer, Wm. Buske; secretary, A. Clubb.

Wm. W. Stickney, for thirty years general manager and secretary of the Stoneware Pipe Co., of East Alton, Ill., was stricken by heart failure Jan. 22, and expired almost instantly. Mr. Stickney was sixty years old, and leaves a wife and one daughter.

An opening for a good man interested in paving brick is offered at Lincoln, Neb., where there is a good plant well equipped for the manufacture of pavers offered for sale. Any one desiring further particulars can address Robert Ryan, Lincoln, Neb.

The Atlas Bolt and Screw Company, Cleveland, O., write that they have booked a number of orders for dryer cars and mining cars for foreign trade. They are getting up a new catalogue, which they hope to have ready for distribution by the 1st of March.

E. A. Poe, the well-known brick manufacturer, of Fayetteville, N. C., writes that he expects to open up a new plant near Wilmington, N. C., where he will manufacture brick on a large scale, and that he will need a great deal of new machinery and brickyard supplies.

Mr. J. S. Hammer, of the firm of Hammer & Gordon, brick manufacturers of Phoenix, Ariz., has sold his interest to Frank Smithline. The firm will hereafter be known as Gordon & Smithline. They turn out a superior quality of both pressed and common brick at this plant.

A fire caused by the thawing out of the water pipes in the engine room of the Superior Press Brick Co., St. Louis, Mo., entailed a loss of $12,000. Fortunately, the blaze was confined almost entirely to the engine room, and most of the damage was done to the machinery.

The brick manufacturing firm of Bickerstaff Bros. & Howard at Seale, Ala., has been dissolved by mutual consent, Mr. H. M. Howard retiring. The others members of the firm, J. H. sr., U. J., A. H. and J. H. Bickerstaff, sr., continue the business under the firm name of the Bickerstaff Brick Co.

J. M. Carter, St. Catherines, Ontario, writes that he would like information in regard to washing clay by machinery. Mr. Carter runs his brick and tile plant by electric power. He says prospects are good for next season's business, and he is getting ready for his full share by making improvements in his plant, putting in a new pugmill, etc.

Edward J. Connable, for years president of the Jackson Fire Clay, Sewer Pipe and Tile Co., of Jackson, Mich., died recently, aged eighty-four years, after a prolonged illness of two years. Mr. Connable had been connected with the Jackson Fire Clay. Sewer Pipe and Tile Co. since 1867. His death is a loss to the community in which he had lived so long.

Gaston & Poynor, Athens, Tex., in remitting subscription to Clay-Worker, say they have recently made their first burn with oil. They found it very satisfactory, requiring less time, but is more expensive for them than wood at $1.40 per cord. Their trade last season was very good, but, in common with other manufacturers in that section, they are suffering from the unsettled condition of railroad affairs.

The copartnership heretofore existing between James H. Welch and John H. Gloninger under the firm name of Welch, Gloninger & Co., has been dissolved by mutual consent. James H. Welch will continue in the "W" fire brick branch of the business, and will operate the works at Monaca, Beaver county, Pennsylvania, with office at that place. John H. Gloninger

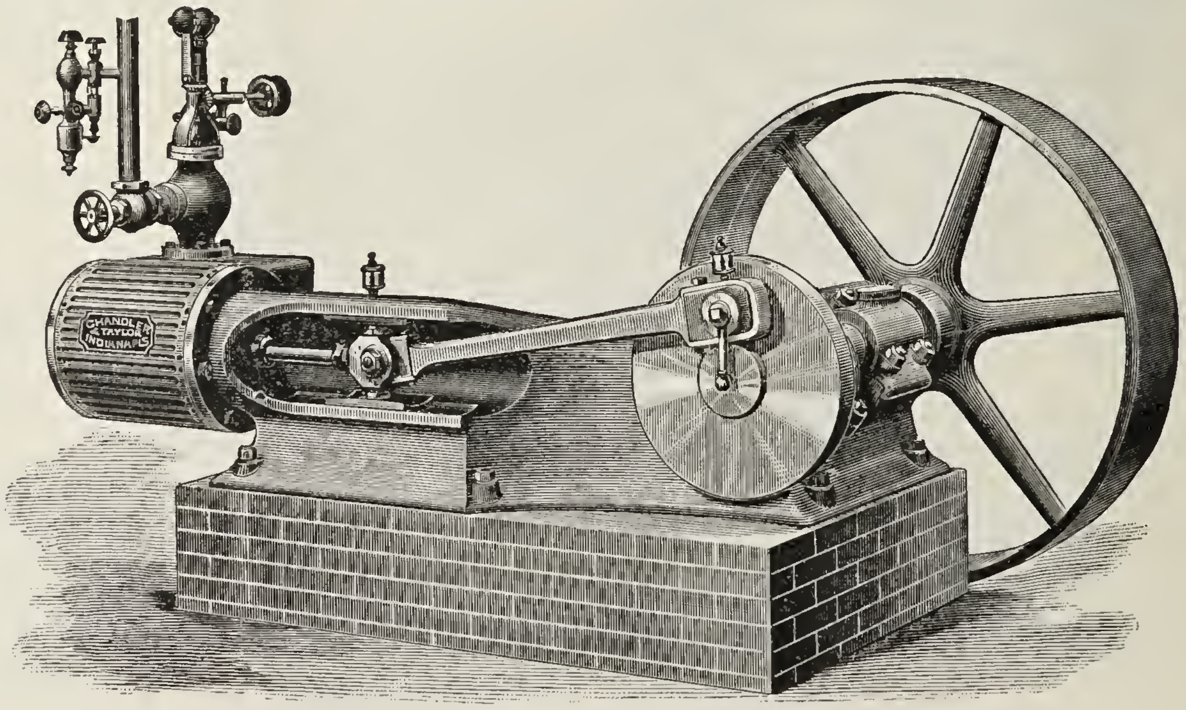
CONTINUED ON PAGE 190.

ENGINES AND BOILERS

Suitable for Operating Clayworking Machinery.

Strong,
Substantial,
Durable.

In stock for prompt delivery.



Manufactured by CHANDLER & TAYLOR CO.,
INDIANAPOLIS, IND.

Send for Catalog and Prices.
Catalogs free.

THE

CHAMBERS MACHINE CONTRACT

IS ALWAYS A SAFE PROPOSITION FOR THE BRICKMAKER.

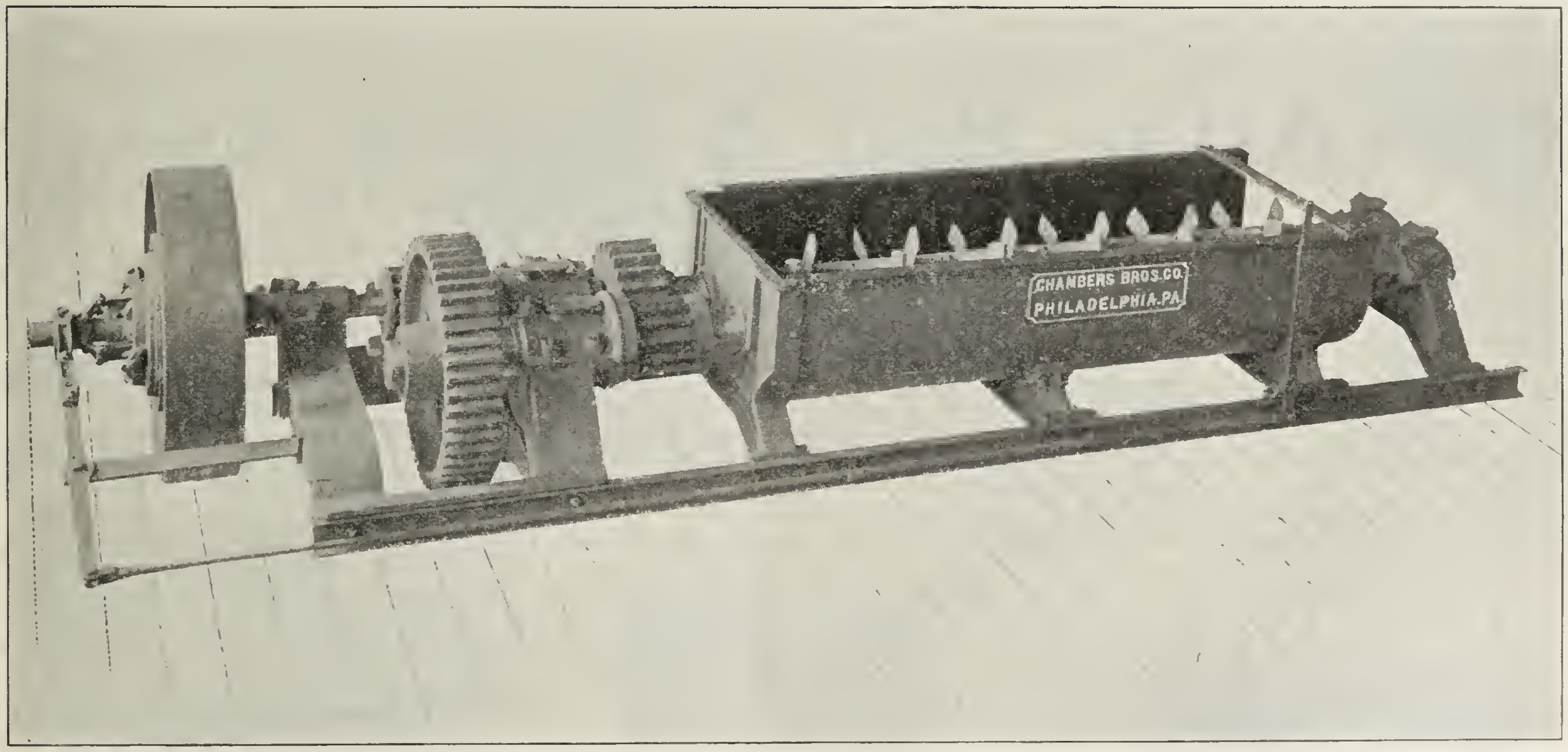
It is short and to the point. Provides in simple language that the machine is to be sent to the intending purchaser **for purpose of trial.** Whether accepted or not, purchaser pays the freight one way, and is liable for loss or damage from fire while machine is in his possession, but aside from this his liability when dealing with us is simply to load machine on cars at his works and ship to our order, if during trial the machine has failed to meet his requirements. The terms of payment, amount to be paid in event of purchase and expected product are mutually agreed upon and written in the contract before machine is shipped, **but we recognize the customer alone as the proper judge of performance.** We will do our best to please him, but failing in that, don't require him to purchase our machine.

During the past twenty years, only six Chambers Machines failed to meet with acceptance after trial. Two of these were experiments, out of the ordinary line, and four were clean failures.

FOUR MACHINES REJECTED IN TWENTY YEARS!

We present the **Chambers Record** with the **Chambers Contract** for your consideration.

The Chambers No. 6 Double Shaft Horizontal Mixing and Pugging Machine.



This mill is shown with open top, but is so designed that the top may be covered, say one-half or two-thirds of the distance back from the discharge end. It is a double-geared machine, with all bearings outside the tub and away from the material to be worked.

It has two 5-inch diameter shafts, carrying 48 steel knives—24 in each shaft—so secured that they can be set at any desired angle. The driving shaft is 2 15-16 inches diameter and is fitted with friction clutch pulley, 36 inches diameter by 8½ inches face, with starting lever located at a convenient position for the attendant. The whole machine is on a framework of steel channels, and all the driving gear is journalled in one solid casting. Width of frame, 3 feet; length, exclusive of driving pulley, 13 feet 6 inches. From bottom of frame to top of tub, 2 feet. Weight, unboxed, about 5,500 pounds. Manufactured, guaranteed and sold on trial by

CHAMBERS BROTHERS CO., Philadelphia, Pa.

EDITORIAL NOTES AND CLIPPINGS—Continued.

will continue in the "waterproof" front brick branch of the business under the title of Glouinger & Co., and will operate the works at Vanport, Beaver county, Pennsylvania, with office at No. 1117 Carnegie building, Pittsburg, Pa.

J. W. Hornsey, who has been managing the Collinwood Brick Company the past year, has returned to his first love, and will manage the business of the Cleveland (O.) Car Company (see ad. on page 102), and supply the clayworkers of the land with improved cars for all brick and tileyard uses.

In a recent letter inclosing subscription Roeske Bros., Michigan City., Ind., say business last year, so far as sales were concerned, was very good, but prices were rather low. They say prospects are bright for better business both in demand and prices. They close by wishing success to the Clay-Worker, which, they say, is "the best of its kind."

Albert Curtis, an employe of the Philadelphia Fireproofing and Brick Co., at South Vineland, N. J., was fatally injured. His clothing caught on the set screw of the shafting, and his body was twisted around the shafting, nearly every bone being broken before the machinery was stopped. He died within an hour after the accident. He was only twenty-three years old, and an exemplary employe.

The Jeffrey Manufacturing Co., of Columbus, O., who have recently taken up the manufacture of standard elevator buckets and spiral conveyors, report a very flattering trade. Its facilities are such as enable it to supply high-grade material at prices which secure for it a large trade for this class of machinery. Any one requiring material in this line will do well to secure the Jeffrey Company's latest catalogue and prices, which will be cheerfully sent upon application.

The Purington Paving Brick Co. held its annual meeting Thursday, Jan. 26, and re-elected the old board of directors, as follows: D. V. Purington, George C. Prussing, S. S. Kimbell, A. A. Smith, W. E. Phillips, W. S. Purington and F. G. Matteson, the first three being from Chicago and the balance from Galesburg. Immediately after the stockholders' meeting the board met and elected the following officers: D. V. Purington, president and treasurer; W. S. Purington, vice president and general manager; Chas. H. Chamberlain, secretary.

AN UP-TO-DATE PLANT FOR MAKING HOLLOW BRICK.

Chambers Bros. Company, Philadelphia, advise us that W. L. Davis, of Berlin, Conn., has placed an order with them for a complete outfit of machinery to make hollow brick. They will supply the brickmaking machine to make end-cut hollow brick, also side-cut brick, one of their new all-iron and steel pugmills, clay elevator, shafting, pulleys, etc., as well as the necessary belting to drive the whole outfit. It will be one of the best rigs for this class of brick ever turned out, and will be placed in position for operation with the commencement of the brickmaking season.

WHO WILL TELL.

Publishers Clay-Worker:

Inclosed please find $2, for which please credit my subscription account for the coming year. The trade for 1899 looks better than ever before in this country, and we had a fair trade in 1898.

I wish to ask a question in regard to pallets. Would it be successful to have about pallets enough to run two days, and just lay the brick from the pallets on the ground, hack the brick and have the pallets for next day? Would the pallets warp and twist? Do you know of such an instance? I have heard of it. I am not just ready to make purchases.

Maitland, Mo., Jan. 8, 1899. H. H. WRIGHT.

PORTLAND, OREGON, HAS A BOOM.

Publisher Clay-Worker:

Please find inclosed draft for $2, with which we wish to renew our subscription for another year.

The only objection we have to the Clay-Worker is, that it does not come every week. It is of special interest to us on account of the distance we are from the large majority of the brick manufacturers of the United States. We have the only dry press brick plant in Oregon.

We have just added to our plant a "Wonder Brick and Tile Machine" which now makes a daily average of about 50,000. The outlook for the coming year is very good. The prospect is that there will be more building next year in Portland than there has been since 1892.

NEWBERG PRESSED BRICK CO.

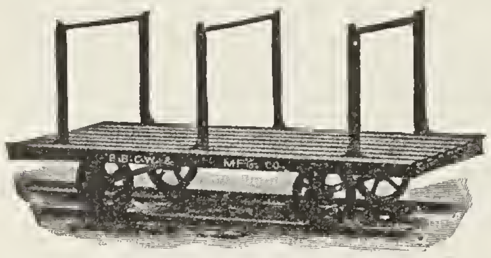
The Atlas Bolt & Screw Co.,

Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

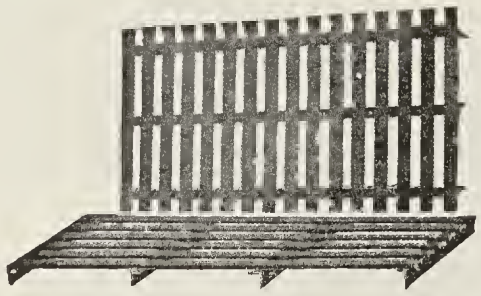
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

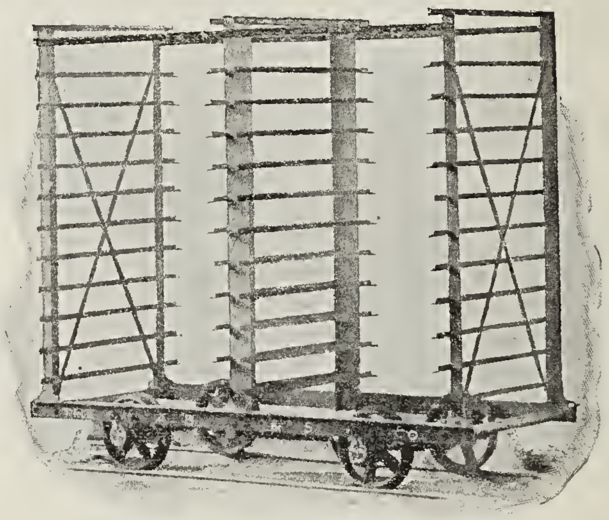
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

STEVENSON & CO.,

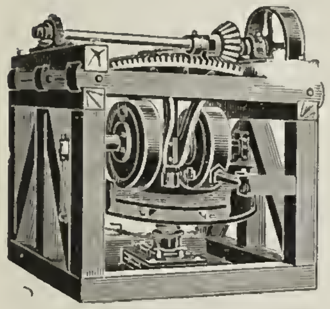
WELLSVILLE,
OHIO, U. S. A.

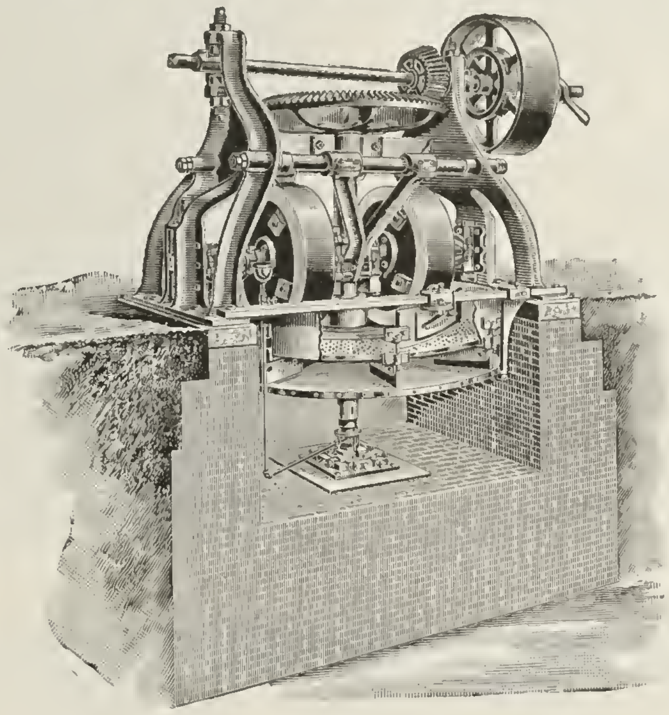
MANUFACTURERS OF

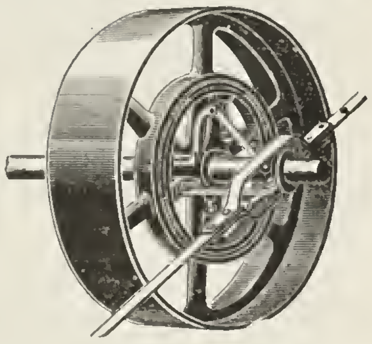
Brick Machinery.

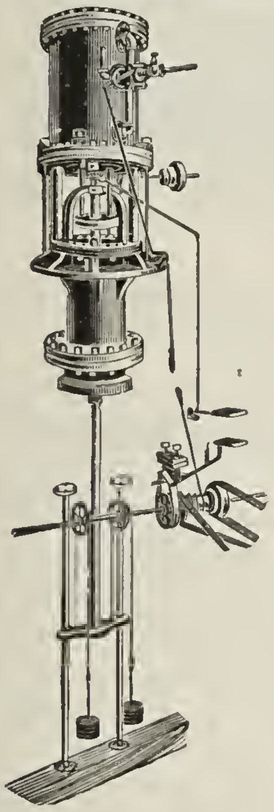
COMPLETE EQUIPMENTS.

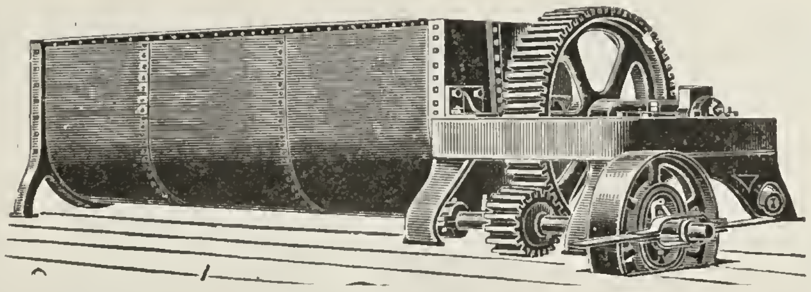
Tile Machinery

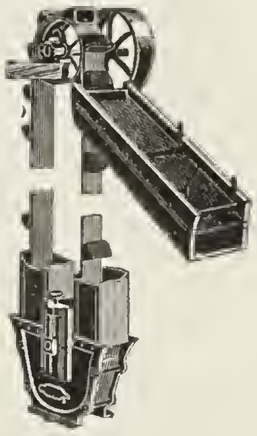












Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED — To buy a brick or brick and tile plant; price not to exceed $6,000. Address
2 1 d SUBSCRIBER, care Clay-Worker.

WANTED — An experienced dry press brick shader. Address
2 1 d BOX 232, Helena, Mont.

BRICK YARD PLANT — For sale, at a bargain. For particulars address
WILLIAM O. AMES,
2 1 cm P. O. Box No. 475, Tallahasee, Fla.

WANTED — A first-class burner; must have first-class references and come on sixty days' trial. Address GUISE,
2 1 d Care Clay-Worker.

WANTED — A dry pan, new or second hand, ready to start; mail description and spot cash price E. J. BURKE,
2 tf d Rochester, N. Y.

WANTED — A good reliable brick and tile maker and burner, by the thousand; everything furnished but the labor. Address
2 2 dw WARREN, care Clay-Worker.

WANTED — Situation as superintendent of dry press brick plant, by thoroughly competent man; excellent reference. Address
2 1 d H., care Clay-Worker.

FOR SALE—No. 5 Brewer Tile Machine; in good order. Tile dies 3 to 10 inches. Side cut brick die. Very cheap.
1 3 c WM. STARE, Mendota, Ill.

FOR SALE — 150,000 new and second-handed pine pallets, 32 and 34 inches long, ten wide. J. F. STENGEL,
1 6 c Ellicott Square, Buffalo, N.Y.

WANTED—Situation by an experienced burner of sewer pipe, fire brick, paving brick and gas retorts. Best of references.
2 1 cm P. W., care Clay-Worker.

WANTED — A No. 4, 5 or 6 Alsing pulverizing cylinder; must be in first-class condition. Address
ATLANTA TERRA COTTA CO.,
2 2t d Atlanta, Ga.

WANTED — To exchange a three-mold Andrus dry press for a four-mold dry press; Andrus or Boyd preferred.
CENTERVILLE BRICK & TILE CO.,
2 1 cm Centerville, Iowa.

WANTED — Second-hand rails suitable for dump car track; state weight per yard, condition and lowest price.
WILLIAM TAYLOR,
2 1 c Carleton Place, Ontario, Canada.

WANTED, POSITION — Manager or superintendent; can take entire charge; fire, building, hollow, common and other brick, tile, sewer pipe, stove linings, etc. Address
2 1 c H. N., care Clay-Worker.

FOR SALE OR LEASE. — Stoneware plant in the middle Trans-Mississippi country; capacity 2,000 gallons per day; demand exceeding capacity; prices good. Address
2 1 c "POTTERY," care Clay-Worker.

WANTED—Situation as general manager or superintendent of a soft mud, stiff mud or vitrified brick plant, by a man of experience and executive ability. Can erect new plant including round or square down-draft kilns.
2 2 d] Address, C. C., care Clay-Worker.

FOR SALE—GREAT BARGAIN—Henry Martin "A" Brick Machine, capacity 30,000, very good order; pug mill, crusher, elevator, shafting, etc, $750. All in first-class working order. Good 30 horse power Erie engine and boiler, $400.
1 tf dm BOX 13, care Clay-Worker.

WANTED — Position as superintendent of brick or drain tile works, by a man who has had twenty years' experience; an all around man in burning, kiln building, management of machinery and of men.
2 1 d "NOS WAD," care Clay-Worker.

POSITION WANTED — By a man of fifteen years' experience in burning and glazing sewer pipe, drain tile, fire brick and paving brick; can give good recommendations. Address "BURNER,"
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FOR SALE— At a bargain, one of the best building brick plants in the State; capacity thirty thousand per day, coal mine within 300 yards of plant; will pay to investigate. Address 1650 HALL PLACE,
2 1 d Indianapolis, Ind.

FOR SALE—A steam brick plant. Good location, capacity 20,000 to 30,000 per day. Will sell all or one-half interest in same. Present owner engaged in other business. Address
CLAY CITY BRICK CO.,
1 2 dm Clay City, Ind.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — One new Henry Martin Letter A. soft mud brick machine; never had clay in her, and was never used.
C. & L. MERRICK,
2 4 d Syracuse, N. Y.

WANTED — A first-class brick and tile burner; must be sober and furnish good reference as to ability; one preferred who would take a small interest in plant. Apply at once
BUTLER BRICK & TILE CO., LD.,
2 1 c Butler, Pa.

WANTED — A practical man for the coast of Mexico, used to the work of fine floor tiles, to help to put up and to put in working order a Horton soft mud brick machine; please state terms.
HERMAN SCHWABE,
2 1 d Tlacotalpam, Mexico.

Continued on Page 196.)

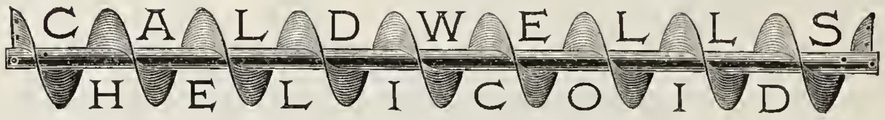
FOR SALE CHEAP.

A Good Dry Press Brick Machine, in good running order, will be sold for less than half first cost. Its all right and a bargain. Have changed to Stiff Clay Process. Address

"SECOND HAND,"

1 tf d **care Clay=Worker.**

Conveving, Elevating and Power-Transmitting Machinerv.



Specialties for handling Material of all Kinds.

CALDWELL HELICOID CONVEYOR, The only perfect Conveyor with flights of one Continuous Strip of metal without seams or rivets.

Link Belting, Sprocket Wheels, Cotton Belting, Rubber Belting, Leather Belting, Belt Clamps, Elevator Bolts, Elevator Buckets, Concrete Mixers, Friction Clutches, Jaw Clutches, Couplings, Flexible Spouts, Gearing (all kinds), Elevator Boots, Hangers, Perforated Metals, Pillow Blocks, Iron Pulleys, Wood Pulleys, Shafting, Set Collars, Swivel Spouts, Take-up Boxes, Turn Head Spouts, Wire Cloth. Send for catalogue.

H. W. CALDWELL & SON CO, General Machinists, 127, 129, 131, 133 West Wash. St., **Chicago.**

"LEVIATHAN."

"Upon Earth There is not His Like."

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MAIN BELTING CO., 55 and 57 Market St., Chicago, Ill.

Gentlemen:—Please ship us via freight, 146′ x 18″ 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige. Yours very truly,

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Manufactured under Special Process.
A Guarantee of Superiority.

NOTE—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

Main Belting Company,

Sole Manufacturers LEVIATHAN BELTING,

55 and 57 Market St., CHICAGO, ILL.

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1219 Carpenter Street.

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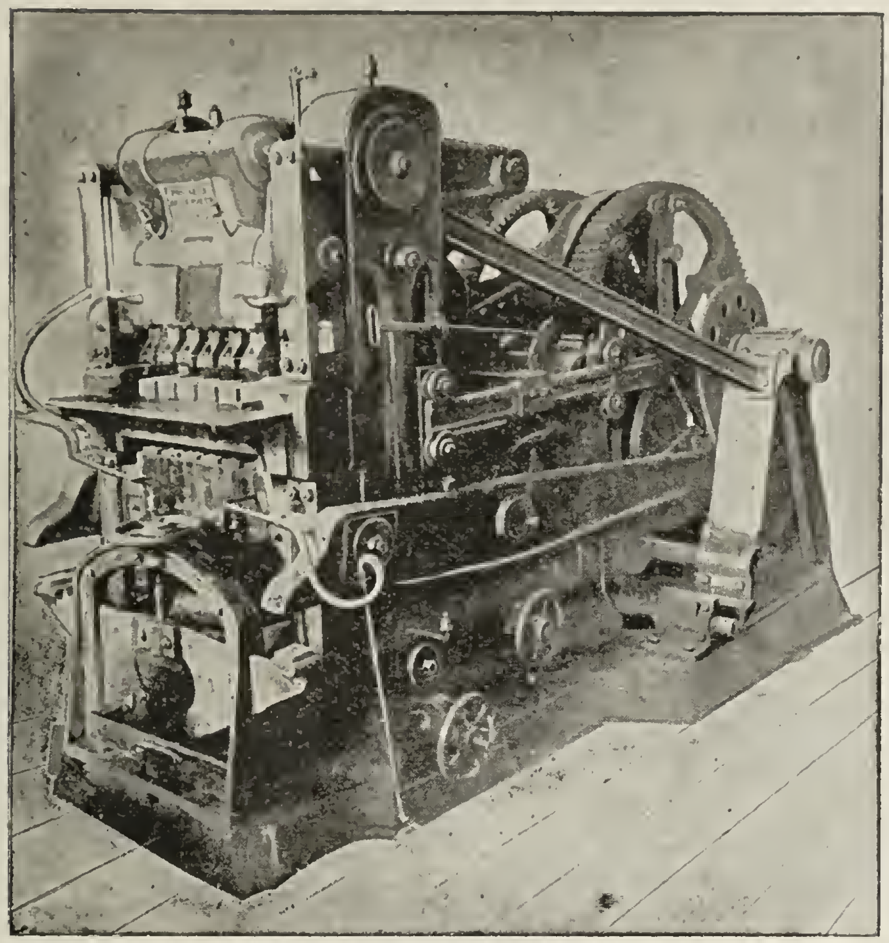


The Progress Brick Press.

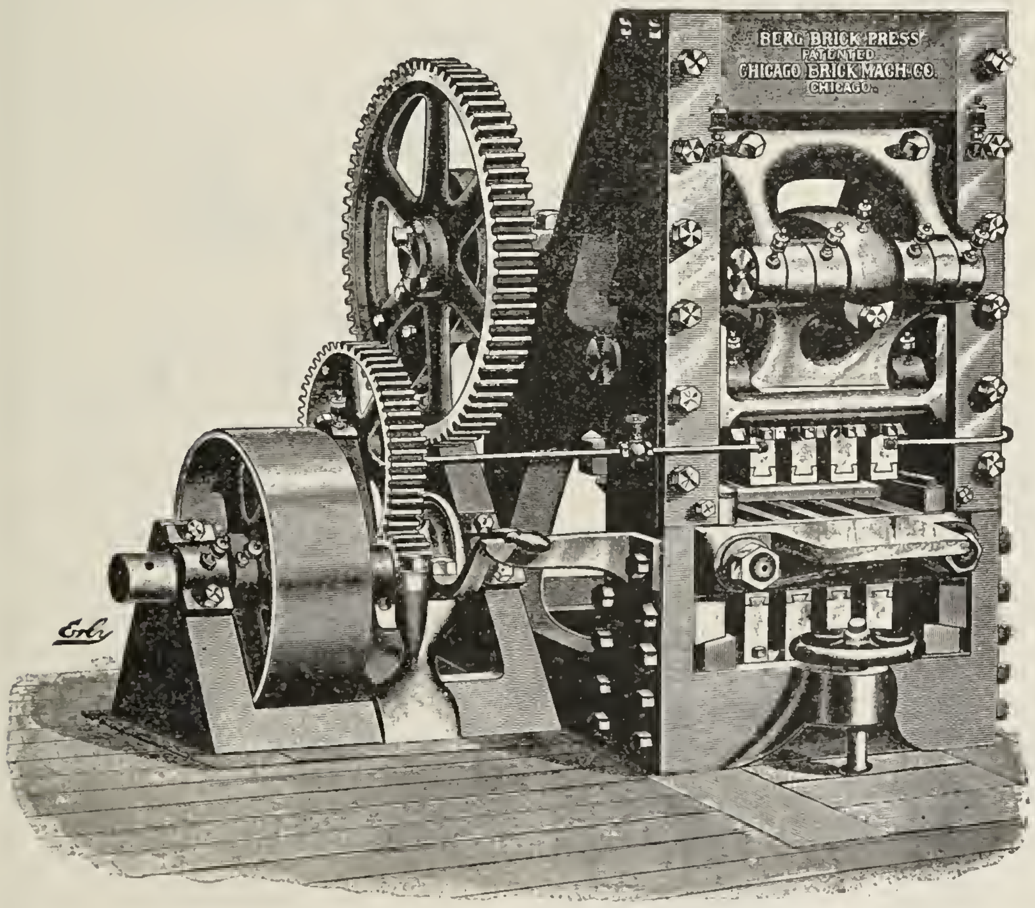
THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and watersmoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE ON APPLICATION. . . . .

Progress Press Brick and Machine Co.,
King's Highway and Oak Hill R. R. ***ST. LOUIS, MO.***



Up-to-Date Machinery.

OUR **BERG BRICK PRESS** is the Most Modern in design and construction of all Dry Press Machines. Simplest, Strongest and most Durable.

It has three distinct pressures and an unequalled Mold Box. Absolutely unbreakable and fully guaranteed. Circular on application.

Our line of **Stiff Clay** and **Soft Clay Machinery** is also strictly **Up-to-Date.** All the latest improvements and most convenient devices.

Send for new 1899 catalogues.

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225 DEARBORN STREET.

When Mr. Culver of the—

Wabash Clay Company,

of VEEDERSBURG,
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Can find time to prepare his "ad." it will occupy this space. Meantime, if you would know about his Company's material and its splendid merits, write for a list of the Cities and Towns that have used it.

Vitrified Paving Brick.

◆

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of $1.00.

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The PURINGTON PAVING BRICK CO.,

of GALESBURG,
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HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

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Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

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OFFICE:—1345 ARCH ST., PHILADELPHIA.
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The Des Moines Brick Manufacturing Co.,

MANUFACTURERS OF

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DES MOINES, IOWA,

Is operating a plant with a yearly capacity of Thirty Million Paving Brick, with unsurpassed shipping facilities.

Estimates on Brick pavements cheerfully given.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

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Office and Works: Clinton, Ind.

INDIANA PAVING BLOCK,

The Standard Shale Block for Street Paving.

Manufactured at Brazil, Ind., by the

Indiana Bermudez Asphalt Co.,

Main Office, 25 and 26 Baldwin Block,
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Prices and samples furnished on application to above address.

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The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

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FACTORY AND SHIPPING DEPOT,
COALDALE, ALA.
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BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

J. L. HIGLEY & CO.,
CANTON, OHIO.

Four of the largest and best paving brick plants in the world.

Canton Paving Block,

Head the list for uniformity, finish and wearing qualities.

Samples sent free on application.

Write for prices.

WANTED Position as superintendent of dry pressed plant, by one who is thoroughly practical in every department of same; have also considerable experience in manufacturing both stiff and soft mud brick; No. 1 reference given. Address
2 1 d m HUSTLER, care Clay-Worker.

FOR SALE — Thirty-five acres of shale land adjacent to land of Wooster Shale Brick Works; brick dwelling house, barn 50x100 feet, running water, good orchard, railroad switch; the finest location for a shale brick plant in Ohio. Address
SECRETARY WOOSTER IMPROVEMENT CO.,
2 1 cm Wooster, Ohio.

FOR SALE — The property of the Warren Brick Co., at Warren, Pa., 66 miles east of Erie, on the Philadelphia & Erie R. R., W. N. Y. & P. R. R. and D., A. V. & P. R. R., has an abundance of excellent clay and molding sand; has a Penfield soft mud outfit, with crusher and elevator, pug mill, etc.; 9-track iron-clad dryer, with cars and pallets; also outside rack capacity 170 M.; railroad siding 400 feet; 4 kilns, capacity one million; natural gas fuel; 2-60 H. P. boilers; 1-50 H. P. engine; a fine property; price low; part cash and good terms to a responsible buyer.
WARREN BRICK CO.,
2 1 d Warren, Pa.

FOR SALE OR LEASE.

One of the best located and equipped brick yards in the State of Connecticut, situated alongside of railroad, side track to kiln, a dozen of first-class brick markets to ship to; inexhaustible bed of clay of No. 1 quality; clay will make street paving, hollow and first quality common brick; favorable terms to responsible parties; property will bear closest investigation; a rare chance. For particulars address
KING WEYANT,
2 2 d Springfield, Mass.

PAVING BRICK PLANT FOR SALE.

Online of Missouri Pacific Ry., within five miles of Kansas City, Kan. There are 2 boilers of 100 horse-power each, an iron steam heat dryhouse, capacity 100 cars; 4 down-draft Gregg kilns, each of capacity 135,000 bricks; 1 Tarkio kiln, capacity 500,000 bricks; brick machine and pug mill, daily capacity 50,000 bricks. This is offered with 39 acres of land on which it stands, and which has an abundance of shale suitable for the best quality of paving brick, as well as clay for building brick. Address for further particulars the owner,
ROBERT RYAN,
2 1 dm Lincoln, Neb.

FOR SALE, AT A BARGAIN.

The only brick plant in Atlantic, Iowa, a town of five thousand inhabitants; capacity two million; 17 acres of land, house and barn; a 25 H. P. engine and boiler, 1 Swords brick machine, 1 Brewer brick and tile machine, 1 Swift patent kiln and one common clamp kiln; shed room for 100,000 green brick; all necessary tools to operate same; a splendid opening for the right man; poor health of manager cause for selling. Address for further information
F. H. CROMBIE or H. J. CAVENAUGH,
2 1 d Atlantic, Iowa.

FOR SALE.

We have for sale the following second-hand brick machinery, in good condition, viz.:

One 24-in. Buffalo exhaust fan, good as new.

One (1) 19-in. Letter "C" Newell Clay Mill, used about one month.

Six (6) Two-wheel Spring Trucks for stiff mud or dry press brick, in good condition.

One (1) ea. No. 1 and No. 2 bottom dumping clay cars, style "F," American Clay-Working Machinery Co. make, in good order.

One (1) ea. Raymond "Columbian" and "Victor" represses.

Two hand-power represses, in fair condition.

One (1) E. M. Freese & Co. stiff mud machine and cutting table, side cut, 30 M. capacity, in good condition.

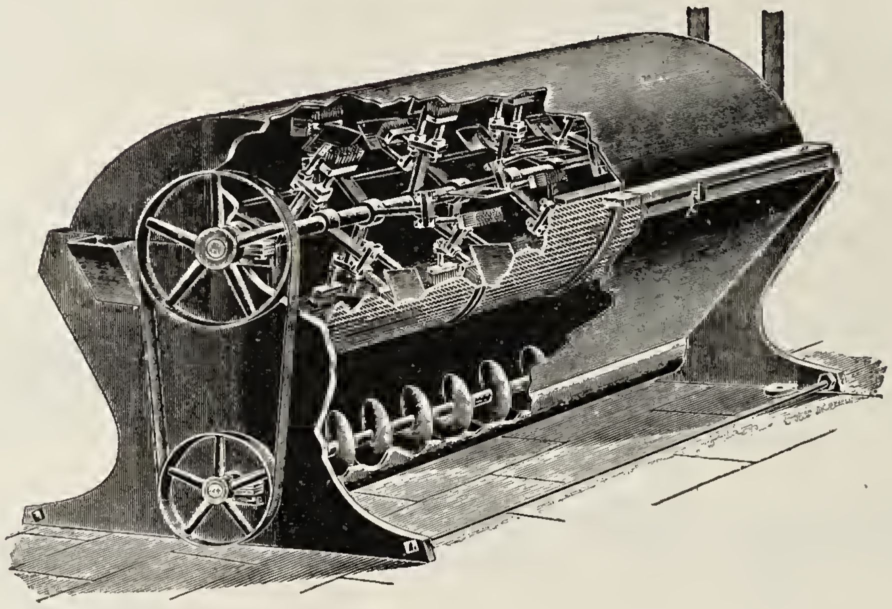
One (1) smooth roll tailings crusher, Frey Sheckler.

One (1) nine-foot Stevenson dry pan, wood frame.

One (1) Frey Sheckler "Acme" side cut stiff mud brick machine, fair condition.
SUBURBAN BRICK COMPANY,
2 3 cm Wheeling, W. Va.

"There are Others," But this is Different.

The BUCKEYE SCREEN.

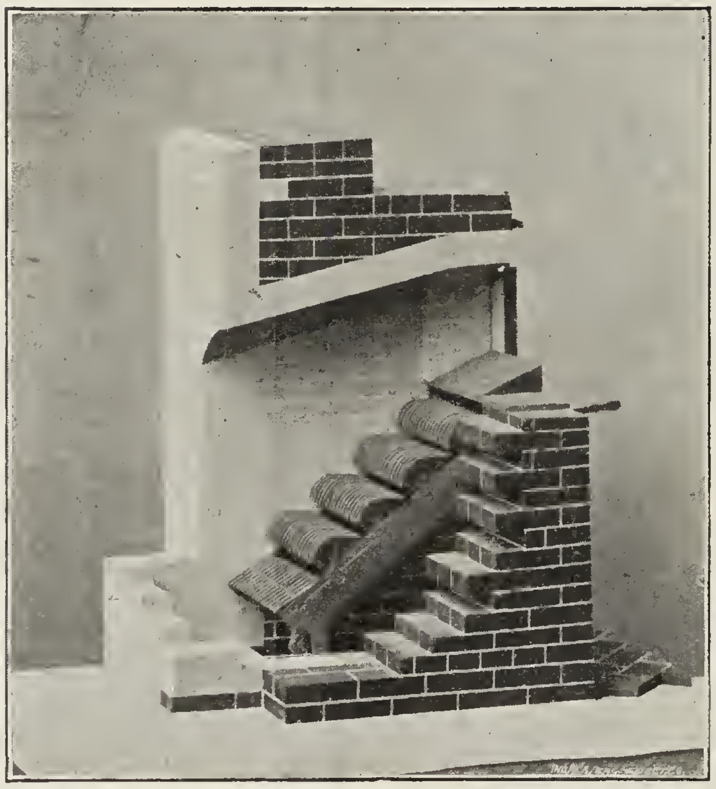


IT DON'T SHAKE.
IT DON'T SLIDE.
IT DON'T REVOLVE.
No noise, dust, dirt, jar or vibration.
Neat and compact.
Perfectly self-cleaning.
Built entirely of iron and steel.
Multiplies its screening surface 24 times.
Capacity unequalled

FOR DESCRIPTIVE CIRCULAR, Etc., ADDRESS

P. A. ARNOLD, Manufacturer,
CANAL DOVER, OHIO.

The ALSIP
KILN FURNACE GRATE,



"PATENT APPLIED FOR."

Can be attached to any style of kiln furnace.

It is a coal coker and a gas generator.

Is self cleaning and has a gradual feed.

Is simple and durable.

Nothing but coal slack needed for fuel.

Guaranteed to save labor and fuel.

Investigate and be convinced.

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ARE YOU LOOKING FOR A . . . .

Steam Brick Dryer?

We have the Simplest, Cheapest and Best.

No Cars. No Tracks. No Fans. No Tunnels. No Brickwork.
Will dry your Bricks in 12 hours. For particulars, address

Martin Dryer Co.,
P. O. Box 87. LANCASTER, PENN.

Evens & Howard Fire Brick and Sewer Pipe Company,
ST. LOUIS, MO.

Thirty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

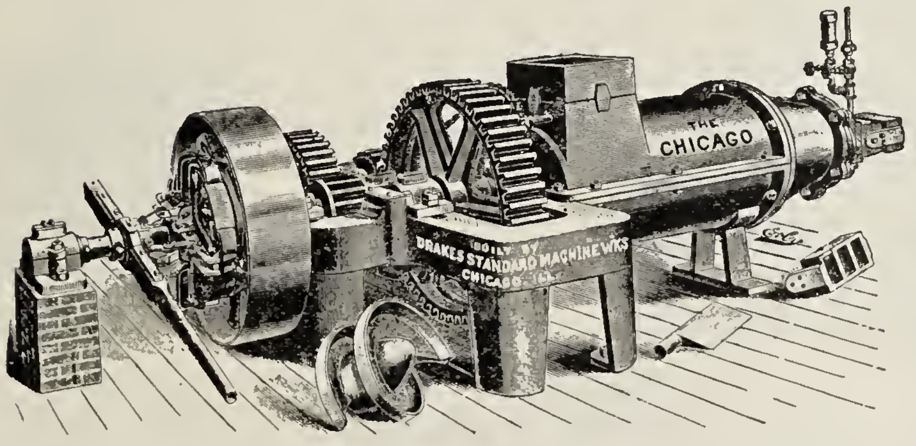
The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS. Agent and Patentee, **161 Grand Street, Rahway, N. J.**

New Brick Machinery

At THE PRICE OF OLD.


THE CHICAGO
BUILT BY DRAKES STANDARD MACHINE WKS CHICAGO, ILL.

We have two first-class Auger Brick and Tile Machines that have never been used except for Exhibition purposes, and consequently are as good as new, that we will sell for $300 each. They are in good running order, have a capacity of 25,000 to 50,000 brick per day, according to clay, speed, etc. Brick dies with machine. Tile dies can be furnished.

We have made a big reduction in prices of our Patent Conical Crushers, also Granulators and Pug Mills. Write for our prices.

Address, **AKE STANDARD MACHINE WORKS,** 300 Jackson Boulevard, **CHICAGO, ILL.**

WANTED — Situation as superintendent or foreman of brick works; soft mud, stiff mud, up draft kiln; good references; 25 years experience; would make by the thousand. Address
12 2 cm MASS, care Clay-Worker.

FOR SALE, CHEAP — Second-hand auger brick machine of large capacity, and as good as new; a real bargain to anyone wanting a good stiff clay brick or tile machine. For price, etc., address
12 3 d "WIRE CUT," care Clay-Worker.

FOR SALE — Brick plant complete, on Ocmulgee river and Georgia & Alabama railroad at Abbeville, Ga. Address
1 2 dm H. O. SNOW,
Administrator estate Geo. W. Reed, Abbeville, Wilcox Co., Georgia.

FOR SALE— Dry-press outfit, consisting of three-mold Boyd, forty-two inch Steadman, elevator, screens, mixer, steamer and pulleys, all in good shape and nearly new. Can be put in operation for test. Price complete $1,500. Clay unsuitable. This is not a worn-out outfit.
THE DAYTON BRICK CO.,
1 1 pm Dayton, Ohio.

FOR SALE — To settle an estate, brick plant in North Adams, Mass., near Fitchburg R. R., with excellent shipping facilities, pallet system, new engine and everything modern, with a capacity of 5,000,000 a season. Best of clay, thoroughly tested, suitable for making common, pressed or hollow brick. Boarding house, engineer's house and saw-mill on yard. Brick can be made there cheaper than on most yards in New England. Address S. P. THAYER,
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A well equipped Virginia brick plant, near a large city, affording a good market. The present price of common brick is $7 a thousand, Pavers $9 to $10. Abundance of excellent clay and cheap fuel. A splendid opportunity for a practical, industrious man. For full particulars address
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FOR SALE.

75 horse power Westinghouse Engine.
3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
6 spring brick trucks.
Lot shafting, belting and pulleys.
1 Barr Pumping Company steam pump.
All new or little used, and in excellent condition. WALNUT,
1 tf d Care Clay-Worker.

FOR SALE.

One Monarch machine, only used one short season.
One extra heavy Quaker machine in good order.
One, horse power machine which we will guarantee good as new, was used to test clay, making about 100,000 brick.
HORTON M'F'G. CO.,
11 tf d Painesville, Ohio.

FOR SALE.

Every one a bargain—all as good as new.
One 4-mold Dry Press Brick machine, 20 M daily Capacity.
One double mold Repress No. 4, 20 M daily capacity.
Two hand Represses, 3 M daily capacity.
One No. 8 Auger Brick machine and one No. 8 Pug Mill, each 40 M daily capacity.
One No. 8 Board Delivery Side Cut Cutting Table.
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FOR SALE — One of the best paying brick and tile factories in Iowa.
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FOR SALE —$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth $2,500. Address F. D. BROWN,
Room 13 Palmer House, Chicago, Ill.
3 t f d

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer,
6 tf d Wellsburg, W. Va.

WANTED — Position as superintendent or manager by man of 15 years' experience. Have good position, but on account of bad health of family would like to change.
Address SUPERINTENDENT,
1 c care Clay-Worker.

FOR SALE—Four-mold Boyd Dry pressed brick machine, quite new, at half cost. Capacity 25,000 to 30,000 per day. Also one 4-mold Eureka dry pressed brick machine, good order; great bargain. One straight line engine, 14x14 cylinder; excellent order; very low. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator.
C. SIEDLER, Pres.
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AN ENGINEERING BUREAU IN RUSSIA with finest references specially skilled in the clay industries, wishes to enter in business relations with high-class manufacturers of all kinds of machinery used in connection with the working and drying of clays. Replies, with illustrated catalogues and prospectus, time required for delivery, price and other conditions.
1 1 c M. S., care Clay-Worker.

FOR SALE CHEAP.

One Eureka Dry Press Brick Machine.
One Stedman No. 40 Disintegrator and Conveyor.
Two Creagers Grand Automatic Brick Machines.
One Creagers Pug Mill.
25,000 yellow pine brick pallets 33x10 inches made of three strips, well cleated together.
1 3 cm JAS. F. GRAHAM, Memphis, Tenn.

FOR SALE

One 1½ yard Marion steam shovel.
Lot of new and second-hand dump cars.
Seven narrow gauge and one standard gauge second-hand locomotives.
One Potts Stock Brick Machine.
One Potts sanding machine.
One seven-foot horizontal pug mill.
Two vertical pug mill, etc.
We manufacture a full line of grinding and mixing pans for brickyards, chemists, smelter, clay pot manufactures, etc. etc.
THOMAS CARLIN'S SONS,
Allegheny, Pa.

SOMETHING ...IN NEW WOODEN PALLETS

SUPERIOR TO
ANY OTHER MAKE.

Write for Sample and Price.

J. N. HAHN & CO.,
CLEVELAND, OHIO.

COX'S

Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

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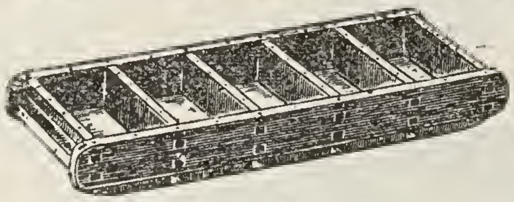

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE **MOULDS**

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

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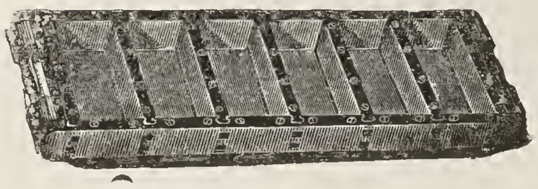
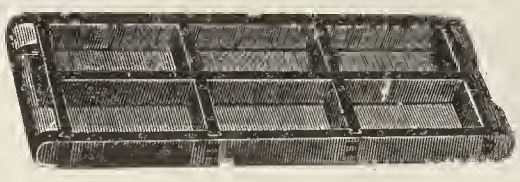
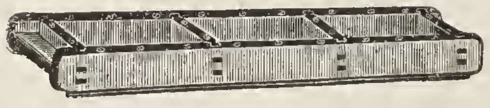


6 Brick Machine Mold.



6 Brick Hand Mold



3 Brick Hand Mold.

NOW Is a good time to look over your stock and see what you will need for the coming season.

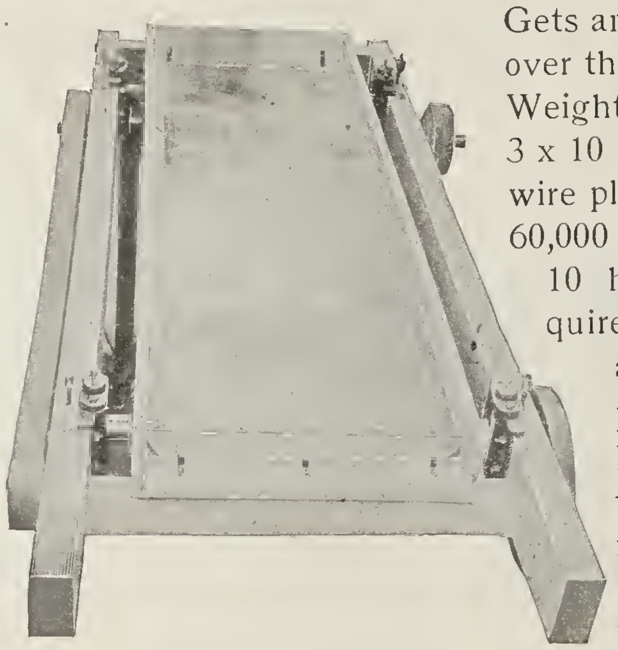
Send your orders to "Arnold's" for what you need. You can send the order now and we will have them ready to ship at the time you want them.

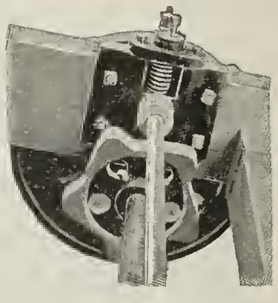
You will be sure to get the best there is made and if you want anything special in the line of Moulds, Trucks or Barrows of different designs you can get it made to order here at reasonable prices.

Moulds, Trucks and Barrows a Specialty.

D. J. C. ARNOLD, New London, Ohio.

The Eureka Screen





Gets an impulse at each corner—vibrates over the whole plate, on the plate only. Weight, 1,500 pounds; 5 x 14 feet over all, 3 x 10 feet screening area, ⅛-inch mesh wire plate. Screens for 60,000 brick per day of 10 hours. Will require the minimum of attention or repairs. Cost, F. O. B. cars, Shoustown, Pa., $150. Work, fittings and material guaranteed.

The only screen in the world screening 100 mesh Manganese.

REFERENCE: Booth & Flinn, Pittsburg, Pa.; Kendall & Flick, Elkton, Va.

CATALOGUE.
[Mention the Clay-Worker.]

CRESCENT MFG. CO., Box 8, Shoustown, Pa.

Do Not Make Dry Press Brick

. . . . . WITHOUT . . . . .

The Carmichael CLAY STEAMER.

T. W. CARMICHAEL, Manufacturer, Wellsburg, W. Va.

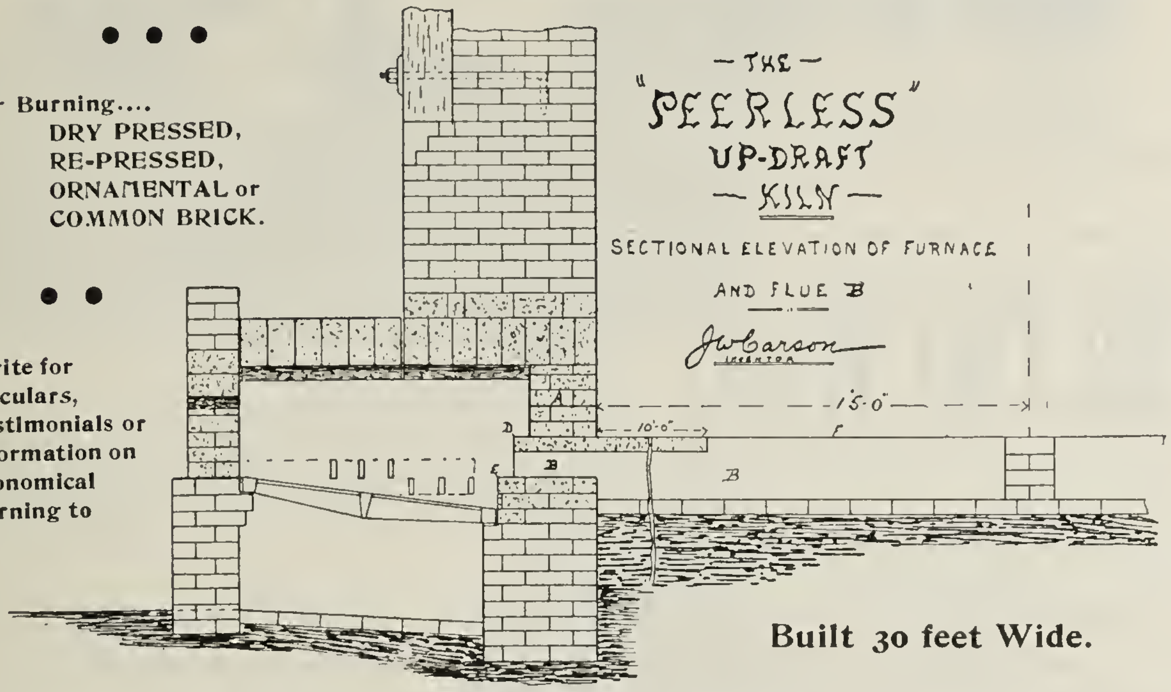
The "PEERLESS" UP-DRAFT ....KILN.

• • •

For Burning....
DRY PRESSED,
RE-PRESSED,
ORNAMENTAL or
COMMON BRICK.

• •

Write for Circulars, Testimonials or Information on Economical Burning to



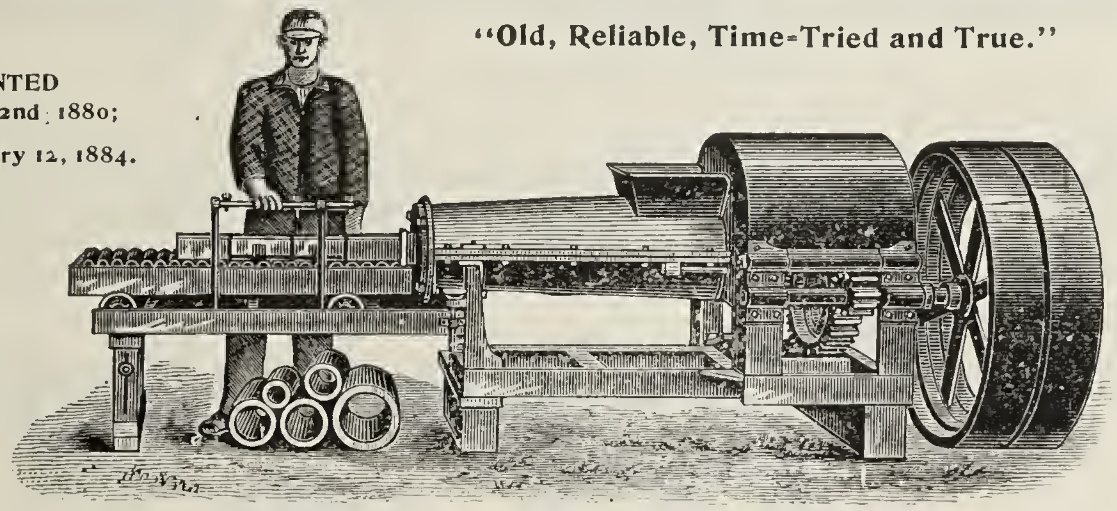
Built 30 feet Wide.

J. W. CARSON, LaPrairie, P. Q., Can.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
June 22nd, 1880;
and
February 12, 1884.



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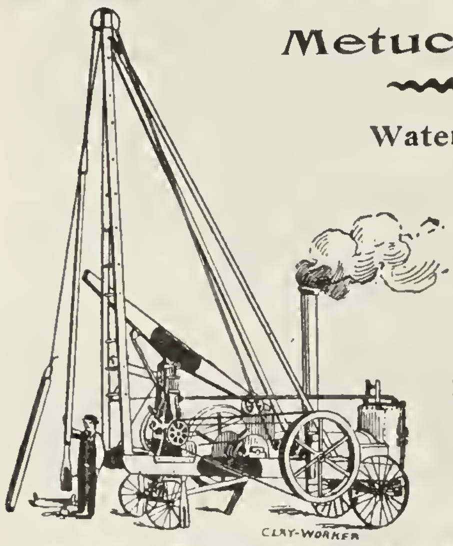

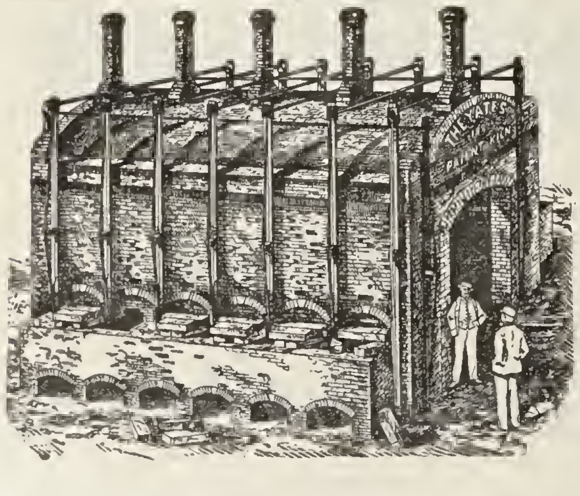

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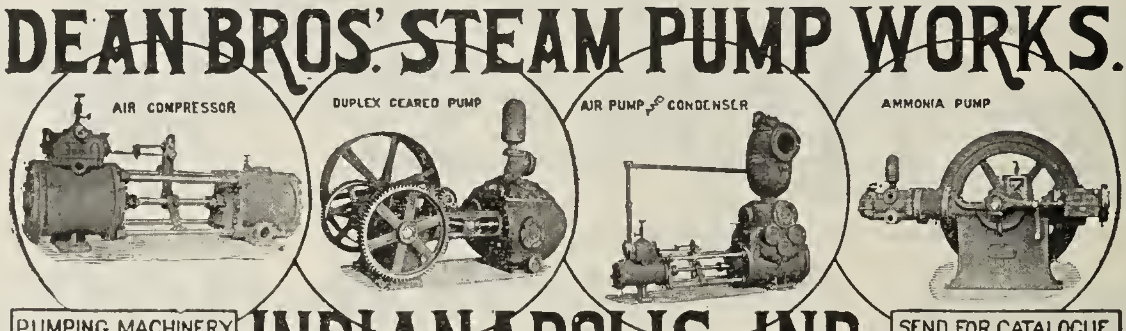

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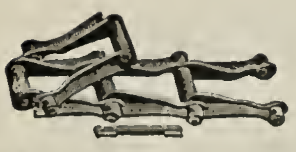

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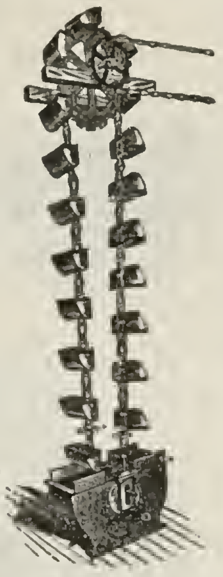

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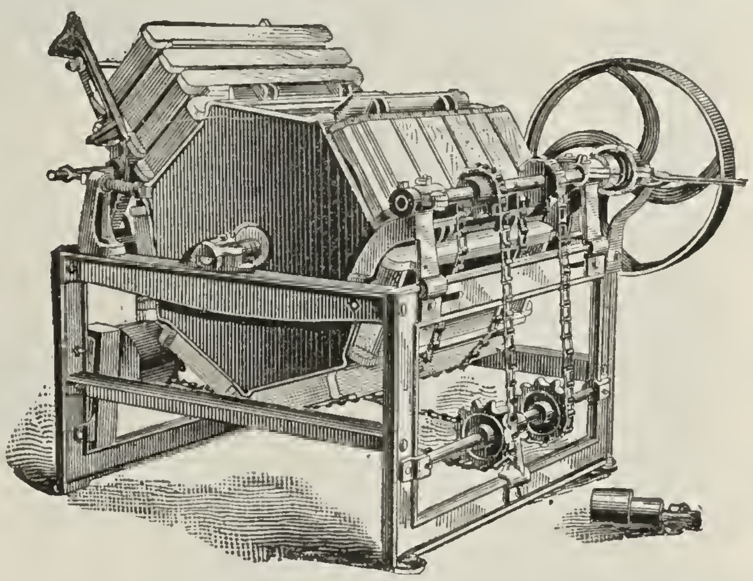

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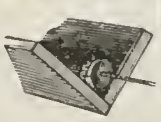

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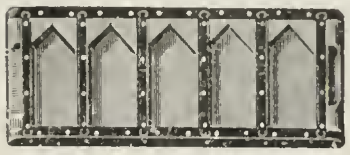

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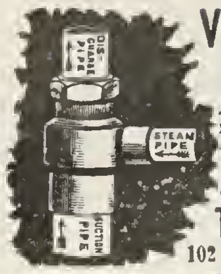

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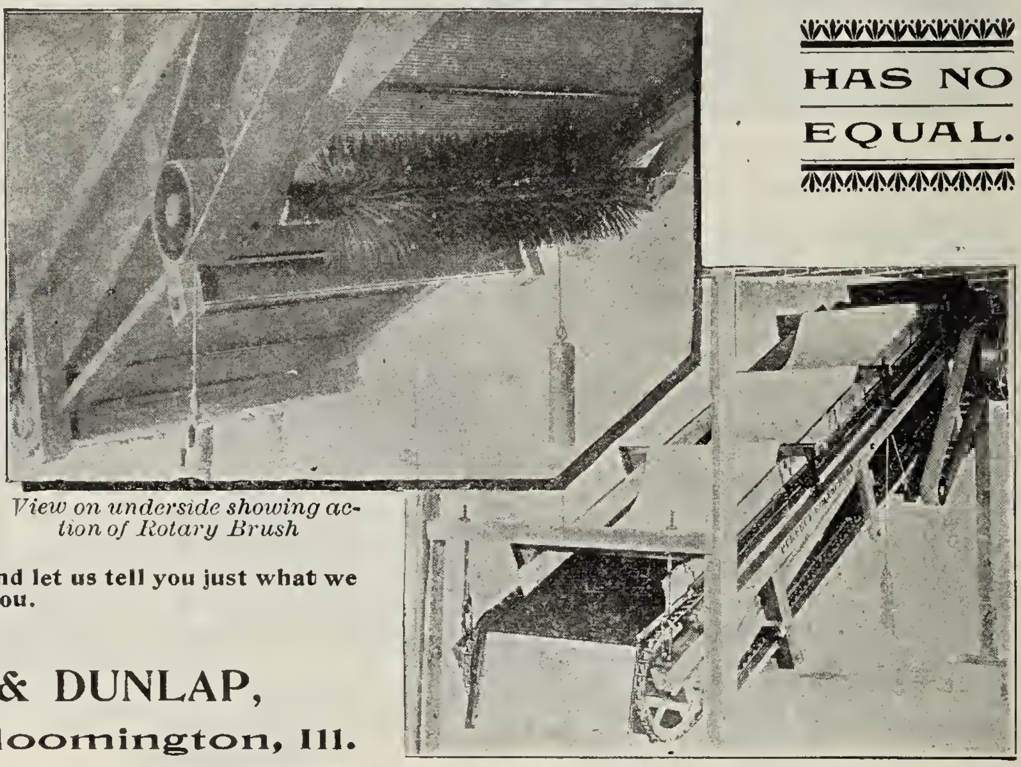

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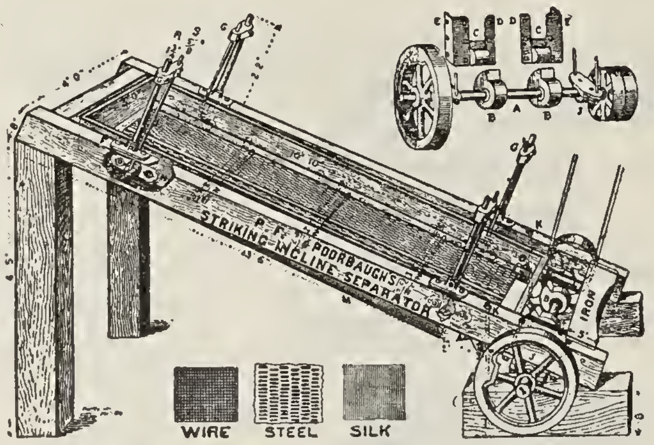

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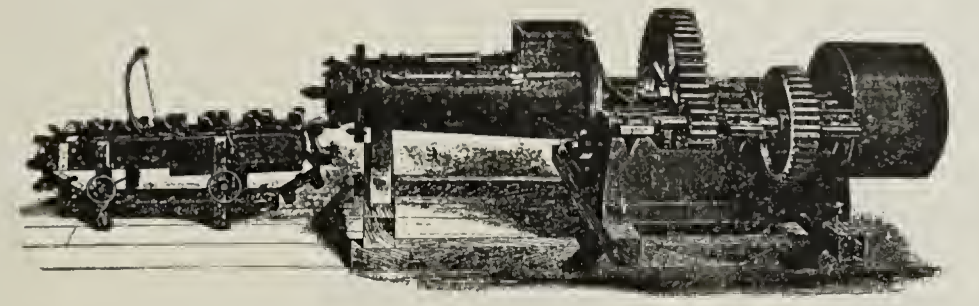

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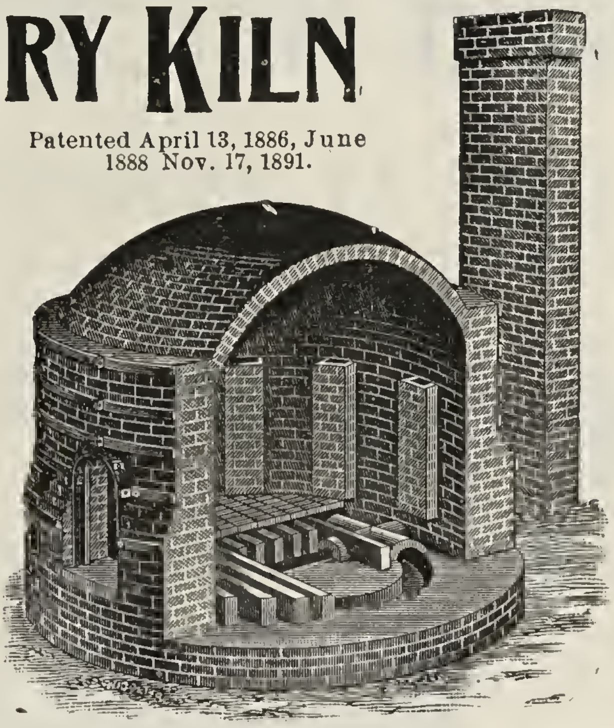

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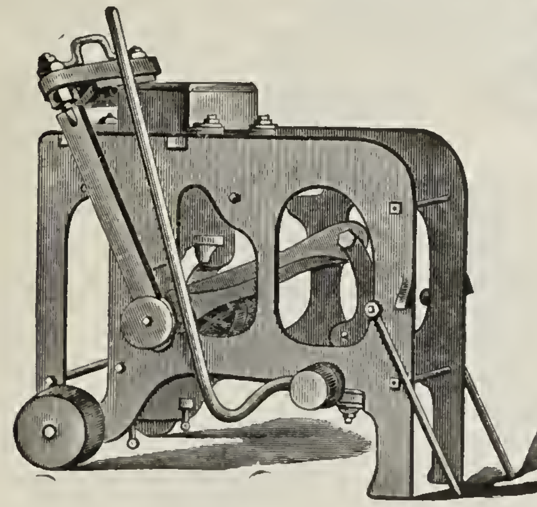

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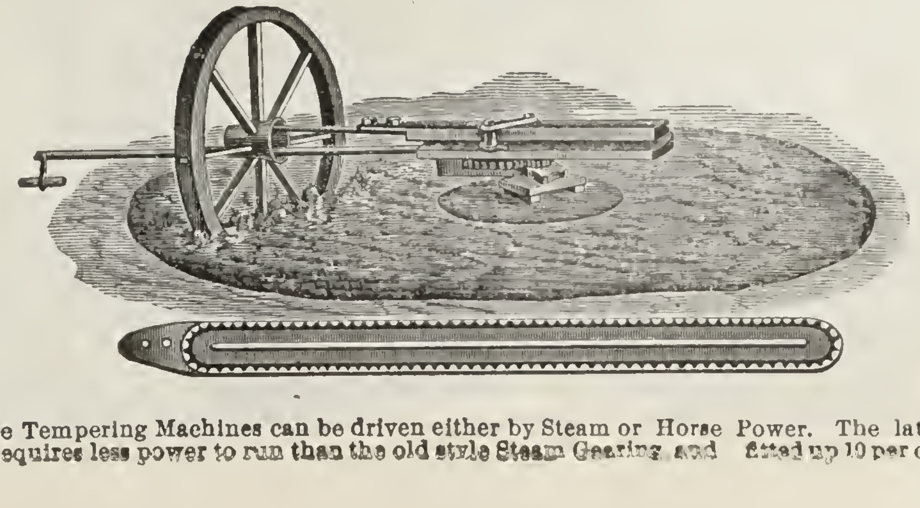

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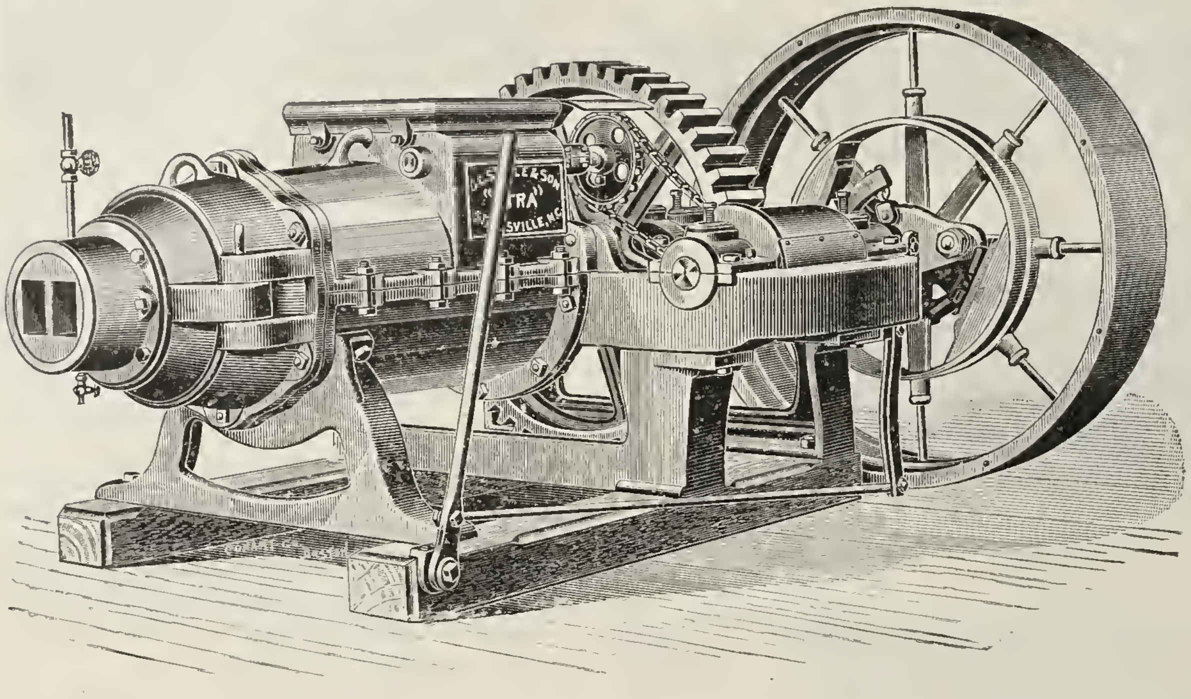

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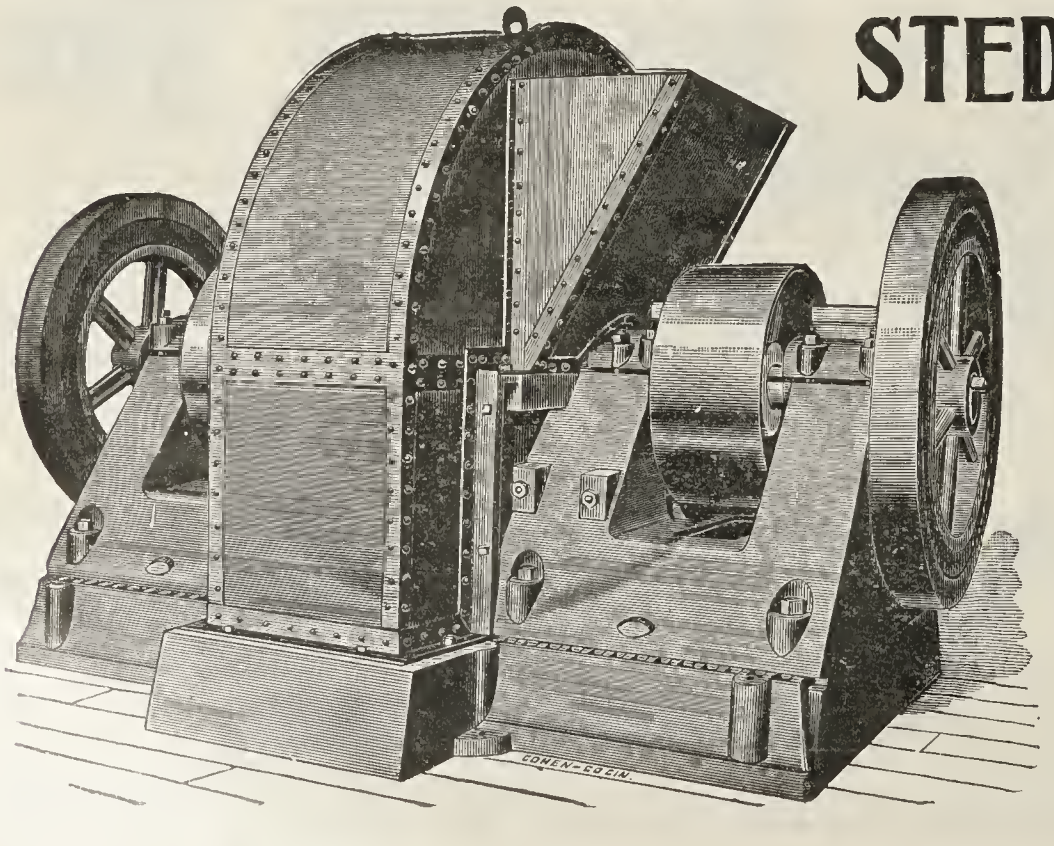

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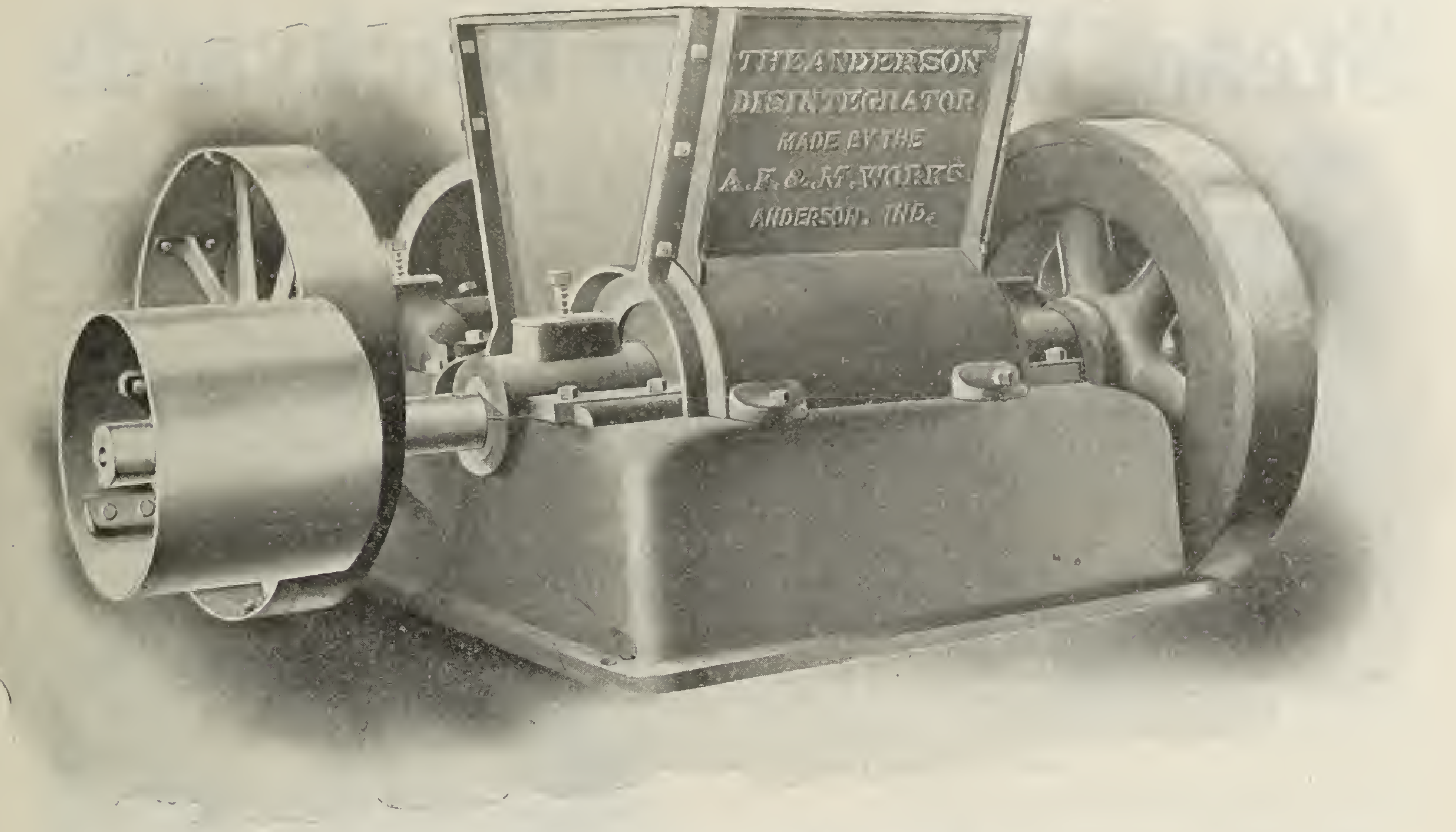

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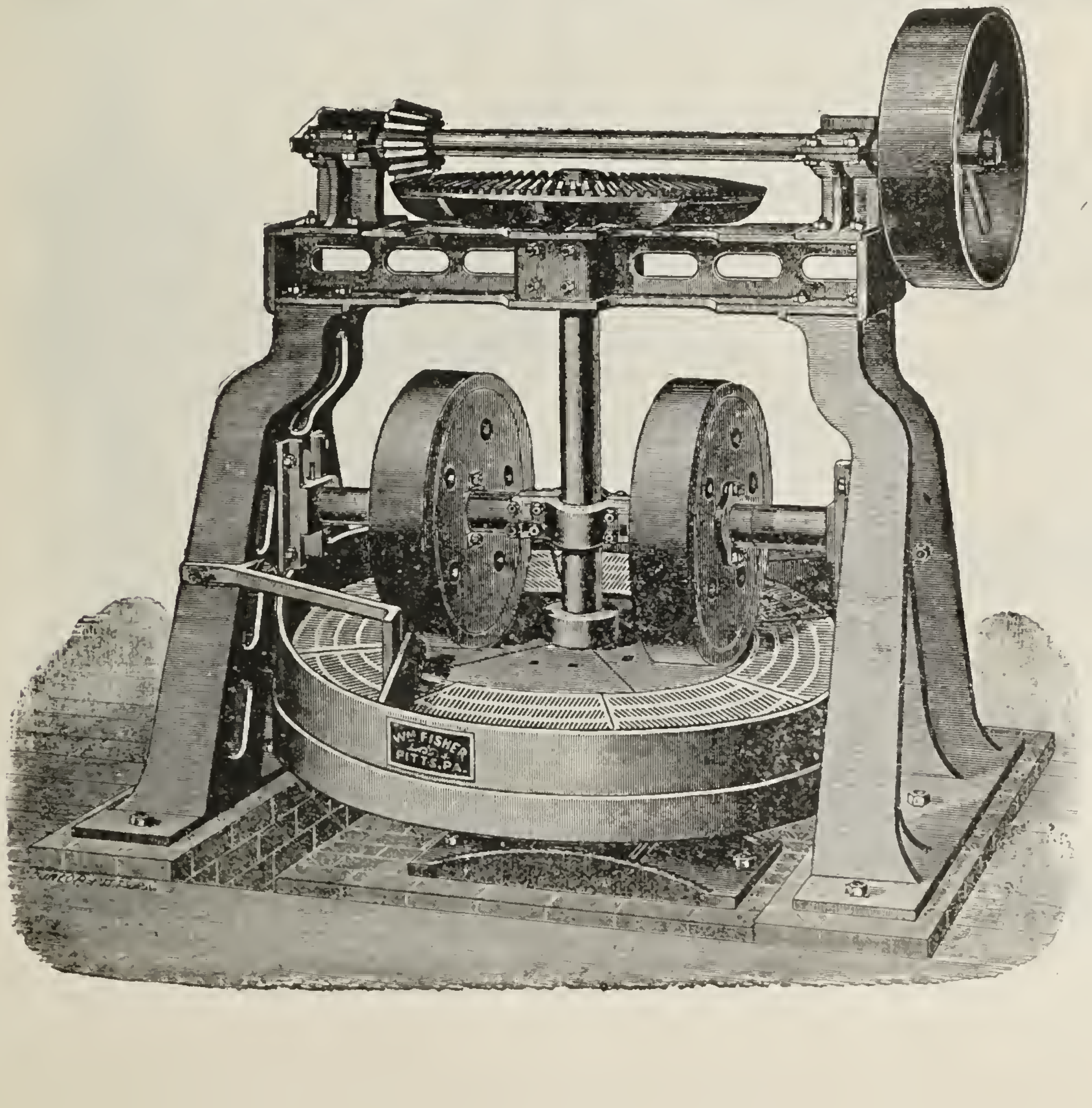

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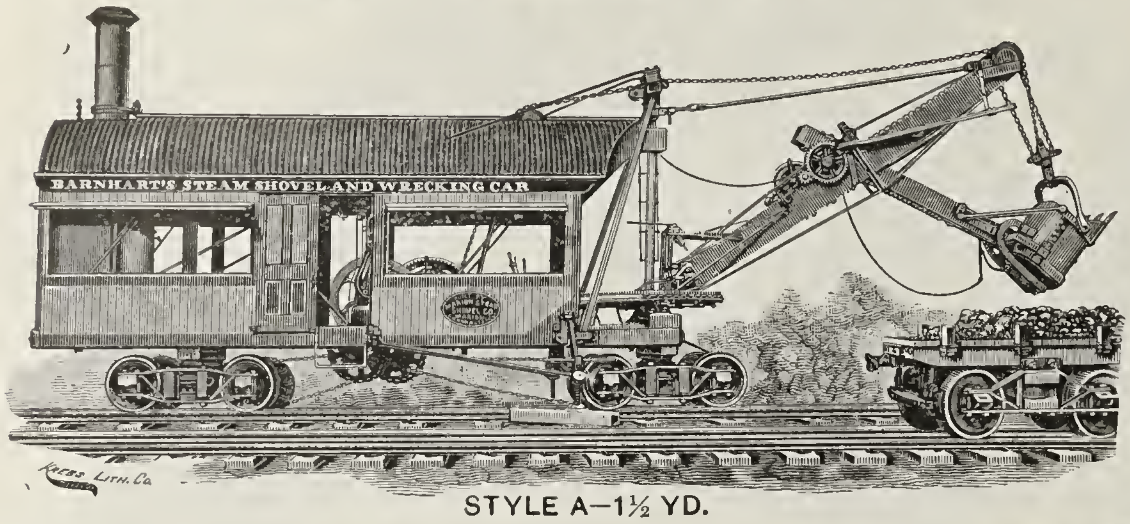
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Kress Lith. Co.

STYLE A—1½ YD.

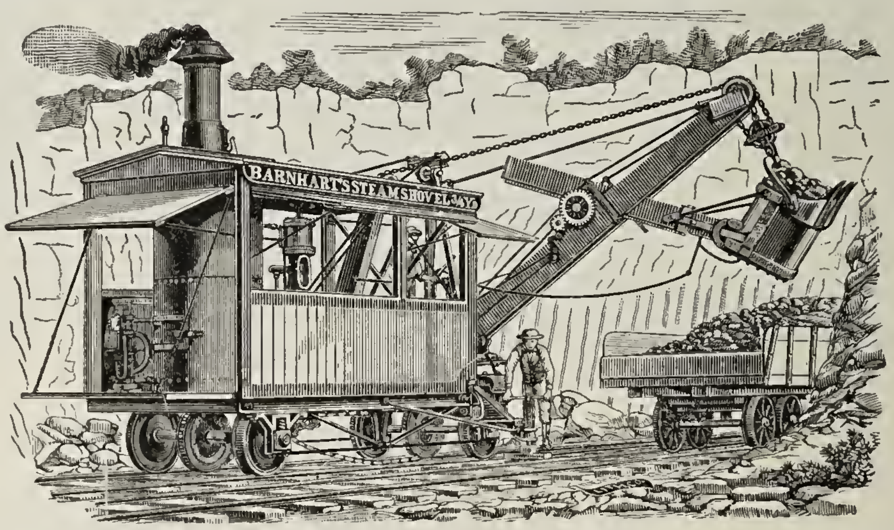
OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

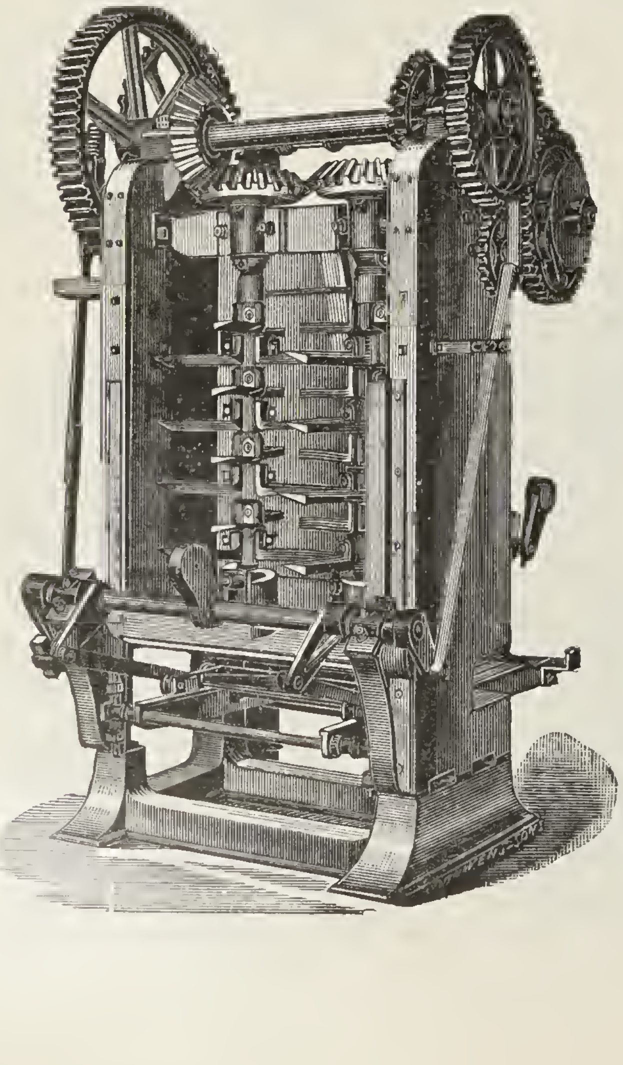
603 West Center Street, - **MARION, OHIO.**



STYLE C—¾ YD.

THE DUPLEX,

Is the Standard of all Soft Clay Brick Machines.



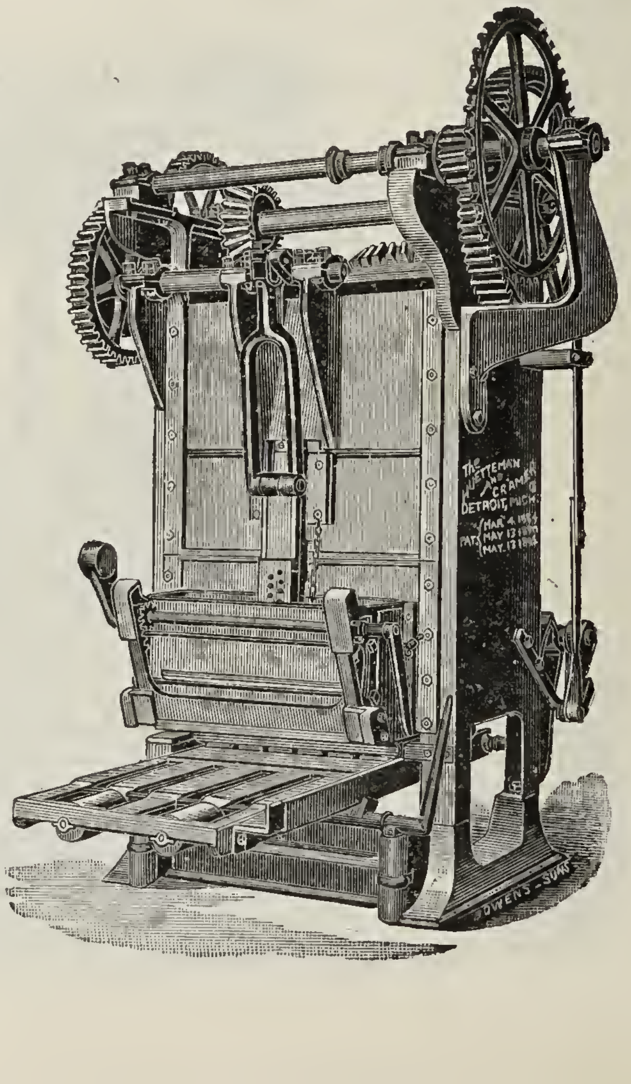
It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE
AND PRICES TO

**The Huetteman
& Cramer Co.,**

Manufacturers of the Duplex Brick Machine and general outfit for brickyards,

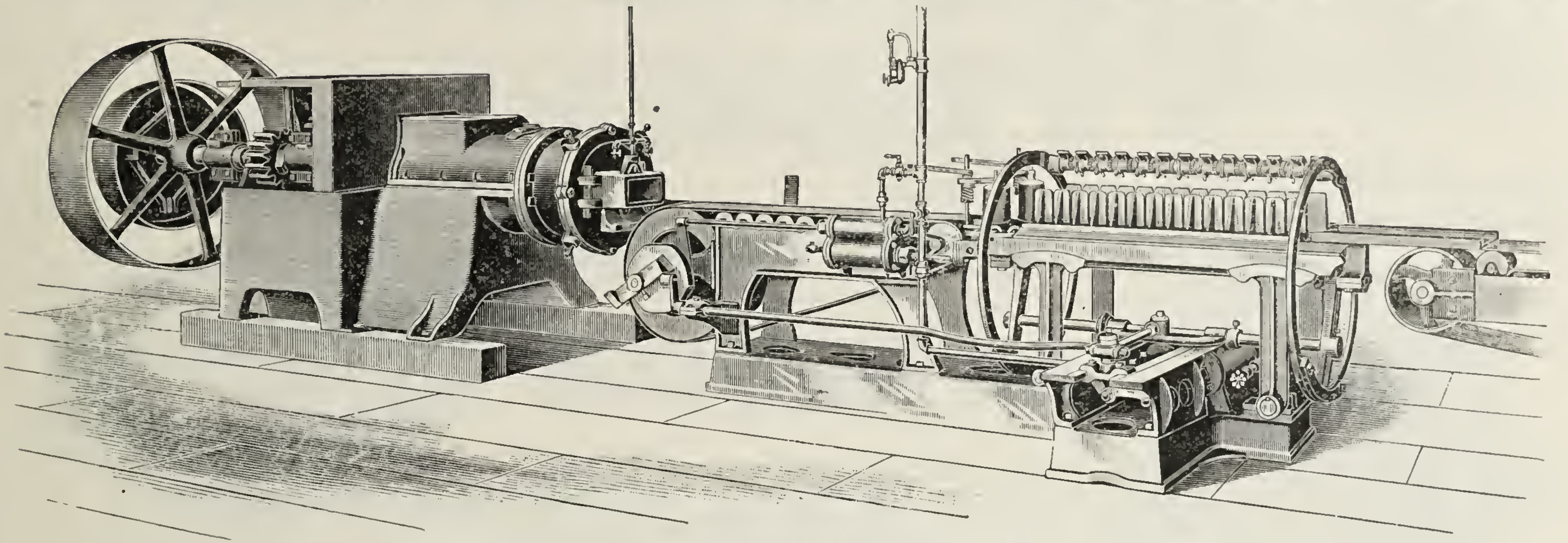
12, 14 & 16 Sherman St.,
DETROIT, - - MICH.


THE HUETTEMAN & CRAMER DETROIT, MICH.

THERE'S ONE BRICK MAHCINE

That does the most work of the highest quality with the least power and repairs,

That's the Leader.

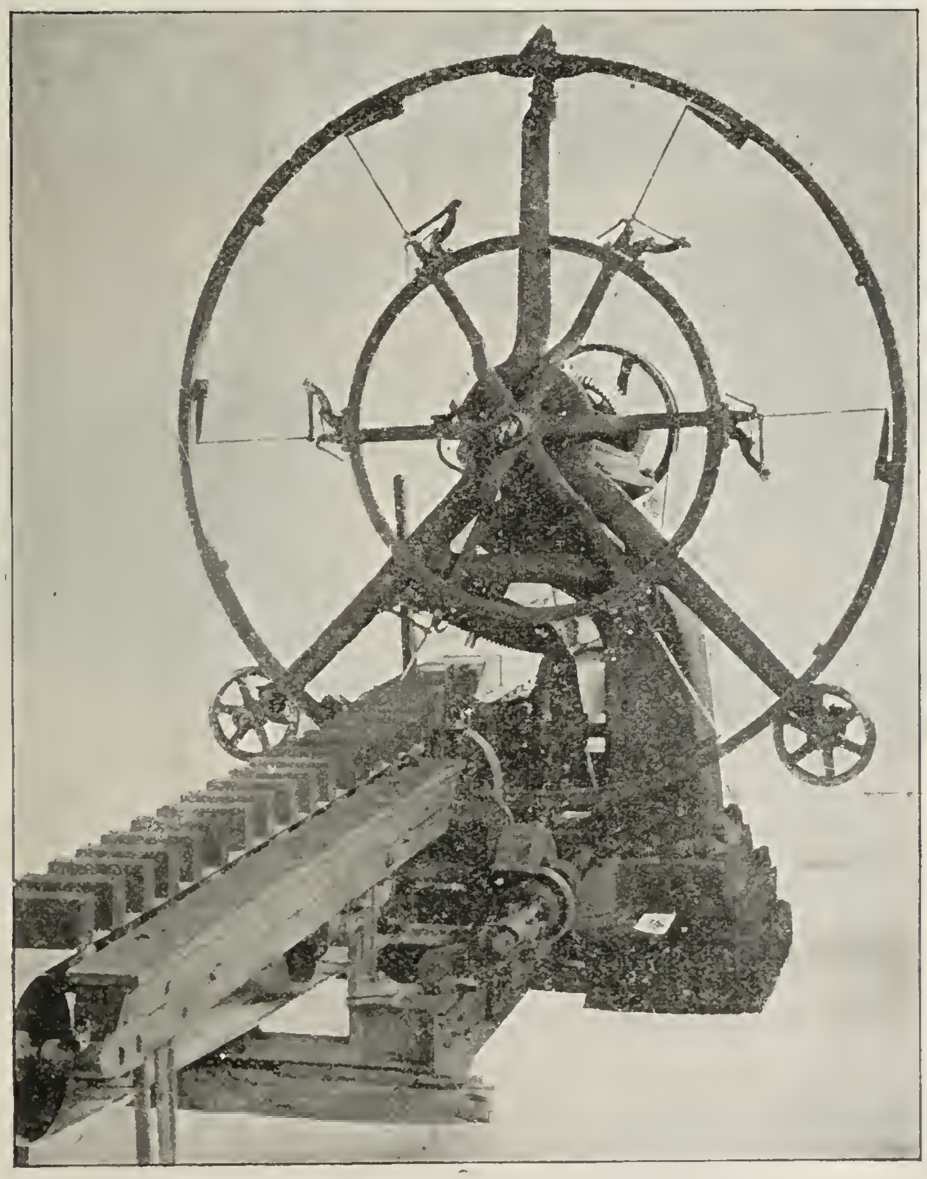


LEADER No. 25, SIDE CUT DIE AND AUTOMATIC CUTTER.

Send your address for printed matter.

LEADER MANUFACTURING CO., Decatur, Ill.

Automatic Side-Cutter For Stiff-Tempered Brick Machines.



The Chambers Automatic Side-Cutter.

A ROTARY CUTTER, simple in construction, reliable, and entirely automatic in its operation. It is extremely sensitive to regulation, and cuts square brick of uniform thickness and smooth angles. The wires always moving with a downward and forward motion, at an angle with the top surface and outer edge of the bar, pushes all obstructions from the surface into the body of the bar, thus avoiding the ruffled edges common with many side-cut brick. The presence of stones or hard substances in the bar of clay—although affecting the quality of the brick—do not damage the cutter.

Broken wires are easily and quickly replaced.

An Automatic wire cleaner (not shown in the illustration) cleans the wires of fibre, roots, etc.

There being no reciprocating motions, this cutter can practically run at any desired speed. The slow motion of 17 turns per minute ot the cutting reel cuts over 100 bricks per minute, and it has a perfectly safe capacity of 200 bricks per minute.

The machinery is above the dirt and all gearing encased.

MANUFACTURED and GUARANTEED. . . . .

Chambers Brothers Co.,
PHILADELPHIA, PA

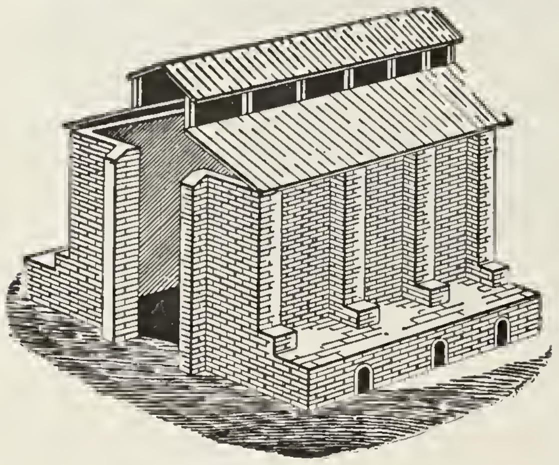
MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,
P. O. Box 335. *ROME, GA., U. S. A.*

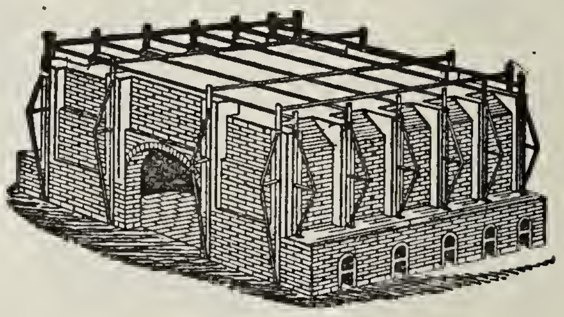


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

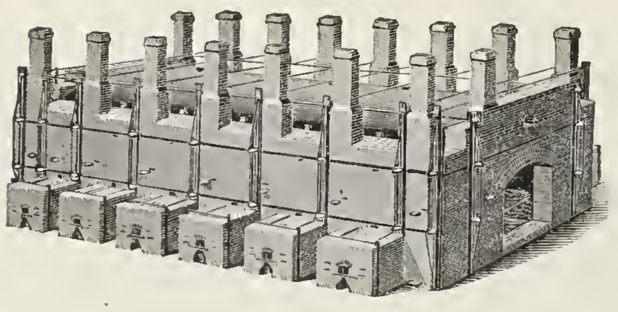
The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, 2,422 Chestnut St., *Kansas City, Mo.*

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.



These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

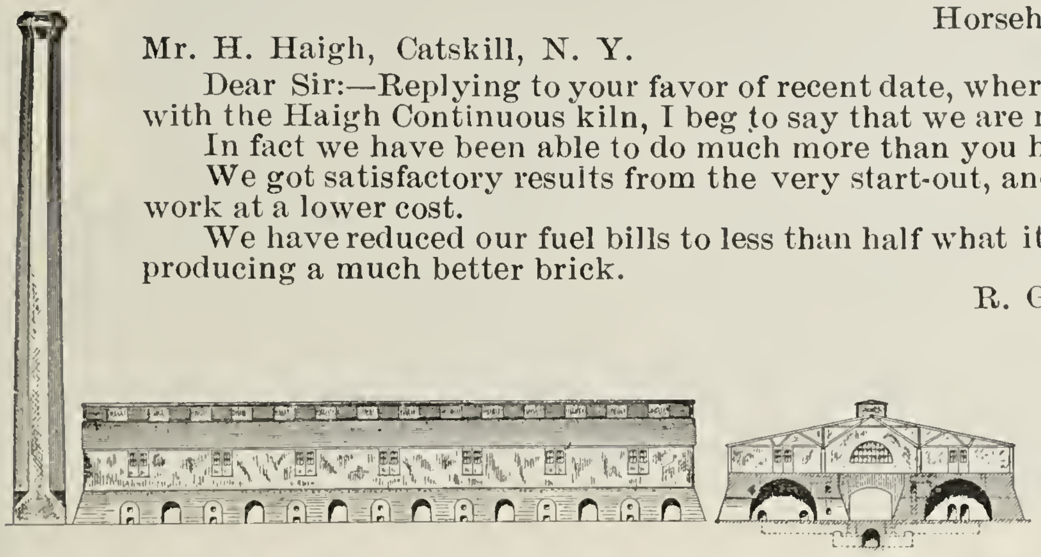
W. A. EUDALY, 509 Johnston Bldg. **Cincinnati, Ohio.**

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

Dry Pressed Facing Brick, Roofing Tile,

Paving Brick and Common Building Brick.



Horseheads Brick Co., N. Y., August 13, 1898.

Mr. H. Haigh, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success.

In fact we have been able to do much more than you had guaranteed the kiln would do.

We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours,
R. G. EISENHART, Treas. and Gen. Man.

This kiln has now been in operation nearly two years, it was guaranteed to burn 25 M per day, at a cost of 25 cents per M with fuel at $2 per ton; I am told it is burning nearly 35 M per day at a cost very much lower than guaranteed.

Address H. HAIGH, Catskill, N. Y.

The Lehmann Portable Continuous Kiln,

And the Lehmann Slumming Apparatus

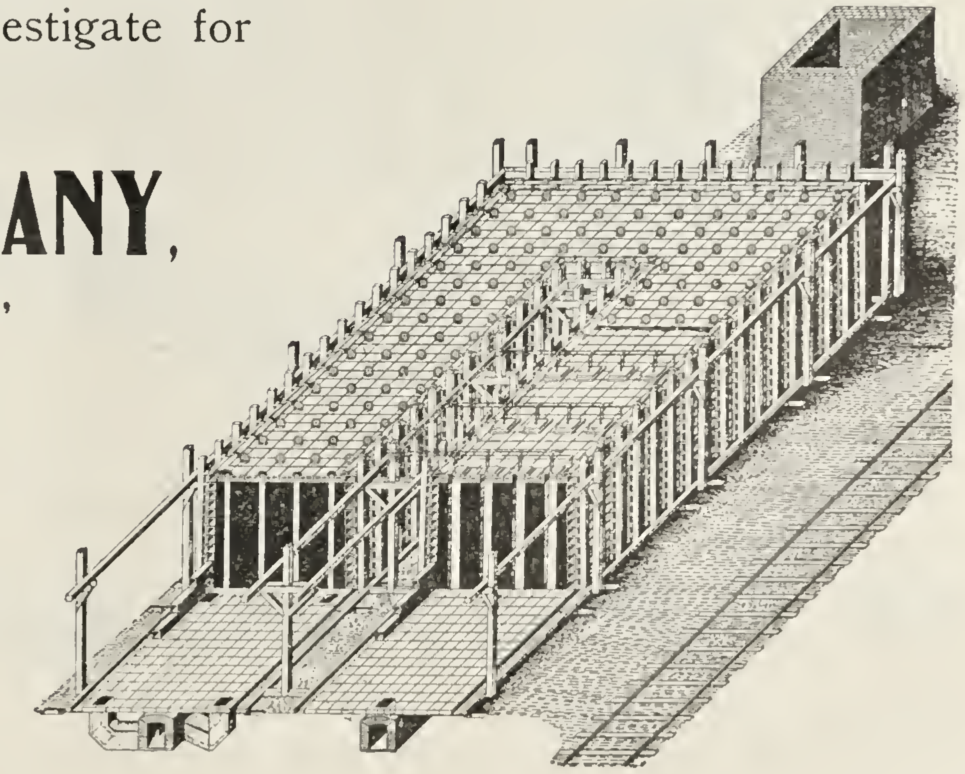
Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

F. LEHMANN & COMPANY,

Foot of West Wellington Street,
CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers, Plans and estimates furnished for Brick, Lime and Cement Works. Practical tests made.

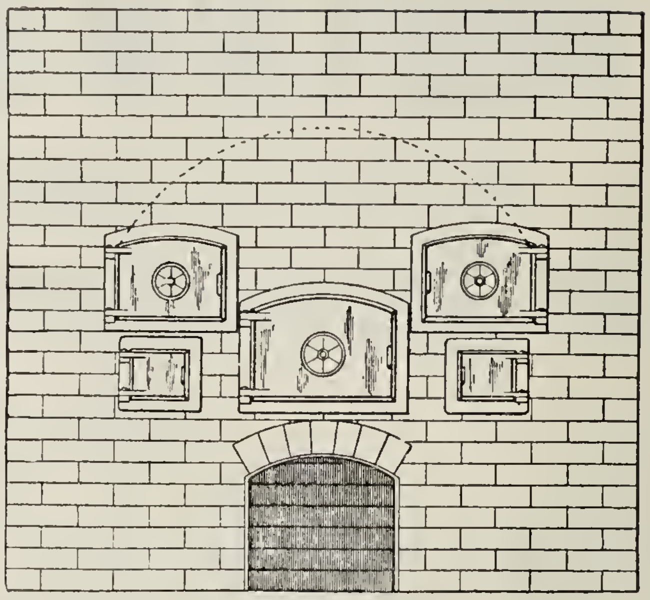
THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.



The GRATH FURNACE.

Gas Producing, Consuming and Coking

The most important invention of the age for producing a Steady and Uniform heat of any degree of intensity out of the cheapest quality of slack coal. Applicable to kilns for burning brick or for annealing Iron or Steel as well as for boilers or where ever heat is required.



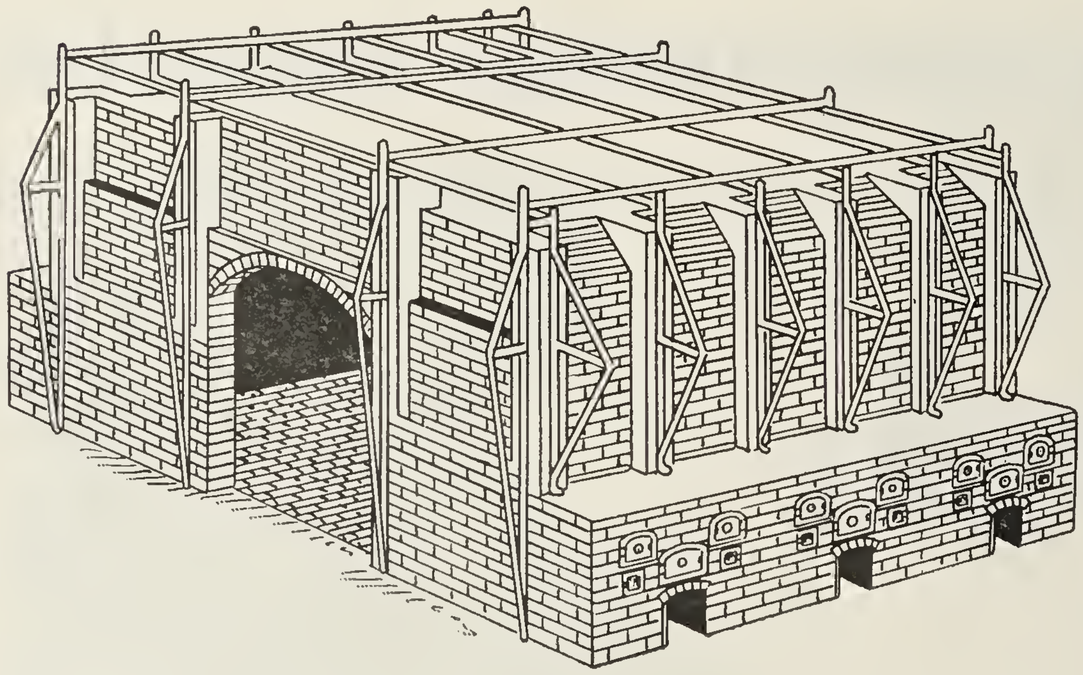
PATENTED.

This is the **ONLY** Furnace which consumes **ALL** the black smoke and which will produce as much heat from one ton of slack coal as can be obtained from same amount of lump coal in the ordinary Furnace.

This is the **ONLY** Furnace ever invented where a part of the heat from the fire box or furnace is drawn under the gas or coking table, which process heats the tables to a red hot heat, thus making a genuine gas Producer and Consumer, as the gases as soon as liberated from the coal, are ignited and consumed by being drawn over the incandescent heat of the coke in the fire box. After the gases are all distilled and consumed from the coal, a solid mass of red hot coke remains on the Gas Table which is then shoved over on the grate bars or fire box by a very simple operation of the fireman. A fresh supply of slack is then placed on the Gas table which instantly begins to generate and consume the gases.

This is the **ONLY** Gas and Coking Furnace that produces a steady and continuous incandescent heat and gas flame combined. The principle embodied in this furnace is a new one and is fully protected in our Patent which has just been granted, and we hereby give notice that we will prosecute all persons using a gas or coking furnace in which the heat or part of the heat from the furnace or fire box is drawn underneath the Gas or Coking Table unless such parties using same secured the right from us.

* * *



PATENTED.

The GRATH IMPROVED DOWN-DRAFT BRICK KILN,

With the Grath Gas and Coking Furnaces attached will produce a larger percentage of Face or Vitrified brick, than any other kiln in the market.

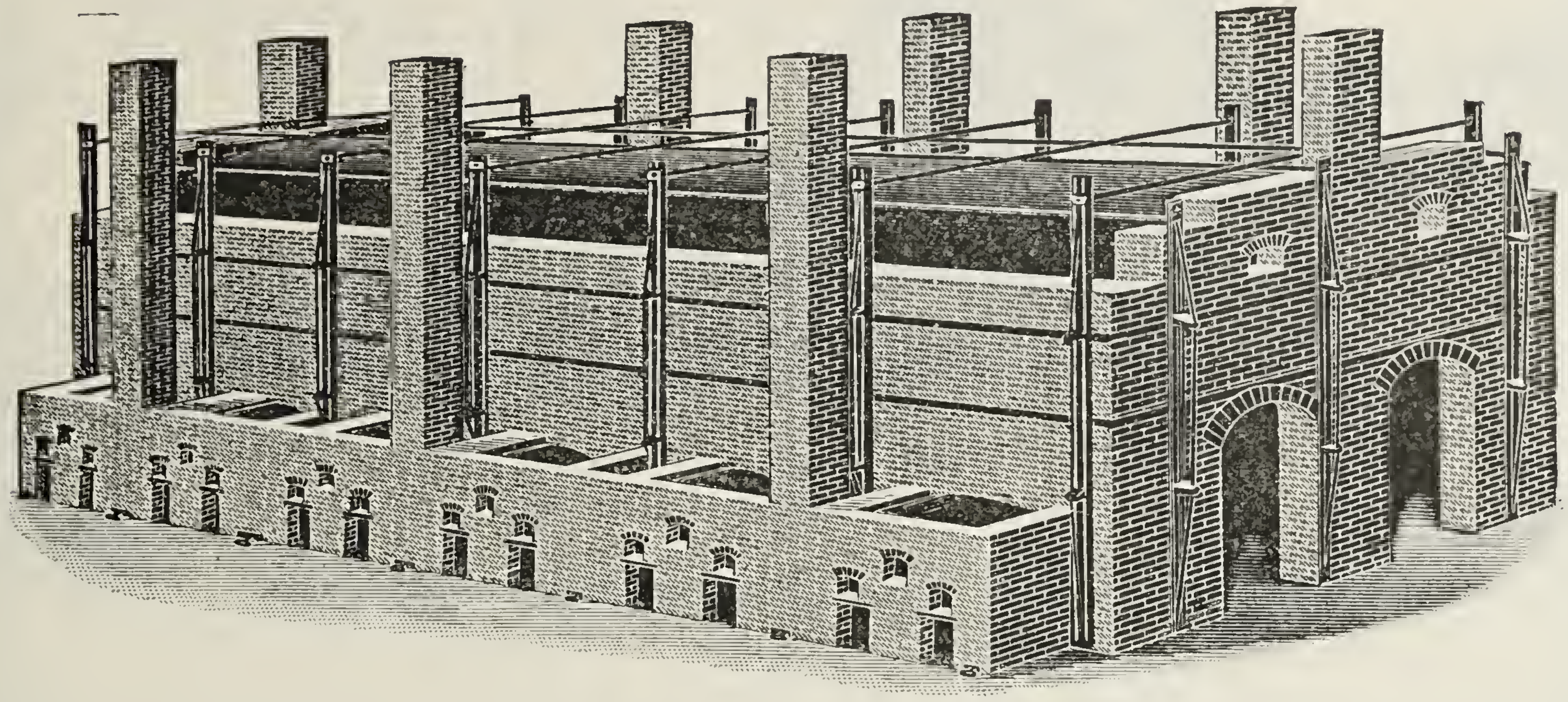
FOR FURTHER PARTICULARS, ADDRESS

The ILLINOIS SUPPLY & CONSTRUCTION CO.,

St. Louis, Mo.

"One of the Greatest Inventions of Modern Times."

F. W. BUTTERWORTH,
Asst. Gen'l Man. Marion Brick Works.



The Swift SLACK COAL COKING-TABLE Furnace Kiln.

THE KILN which has a solid bottom, which is much cheaper to begin with, and is always in repair.

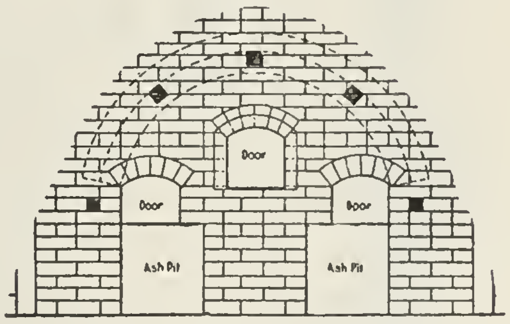
THE KILN that will save one ton of coal out of every seven tons you are using.

THE KILN which is so constructed that the heat is drawn from the bottom with Fan to dryer without danger of checking the cooling ware.

THE KILN that we will guarantee to burn any kind of clay ware with nothing but Slack Coal from start to finish of burn.

THE KILN that will burn Paving Brick in from 30 to 60 hours less time and not injure the ware, as the cold air is excluded from start to finish.

THE KILN that has the famous **Swift Coking-Table Furnace** attached to it; the furnace which is to-day being attached to all kinds of kilns—Up-draft, Clamp, Down-Draft, Round and Square, and also one continuous Kiln, has been re-modeled, and is giving entire satisfaction.



THE SWIFT COKING TABLE FURNACE.

BEWARE OF IMITATIONS,

And do not purchase or use furnaces with coking table between two fires. Such tables are infringements on my patents and their use will subject users to royalty and the cost of collecting same. I am the originator of the idea of a coking bench between two fires, my invention is covered by letters patent and I propose to protect same fully.

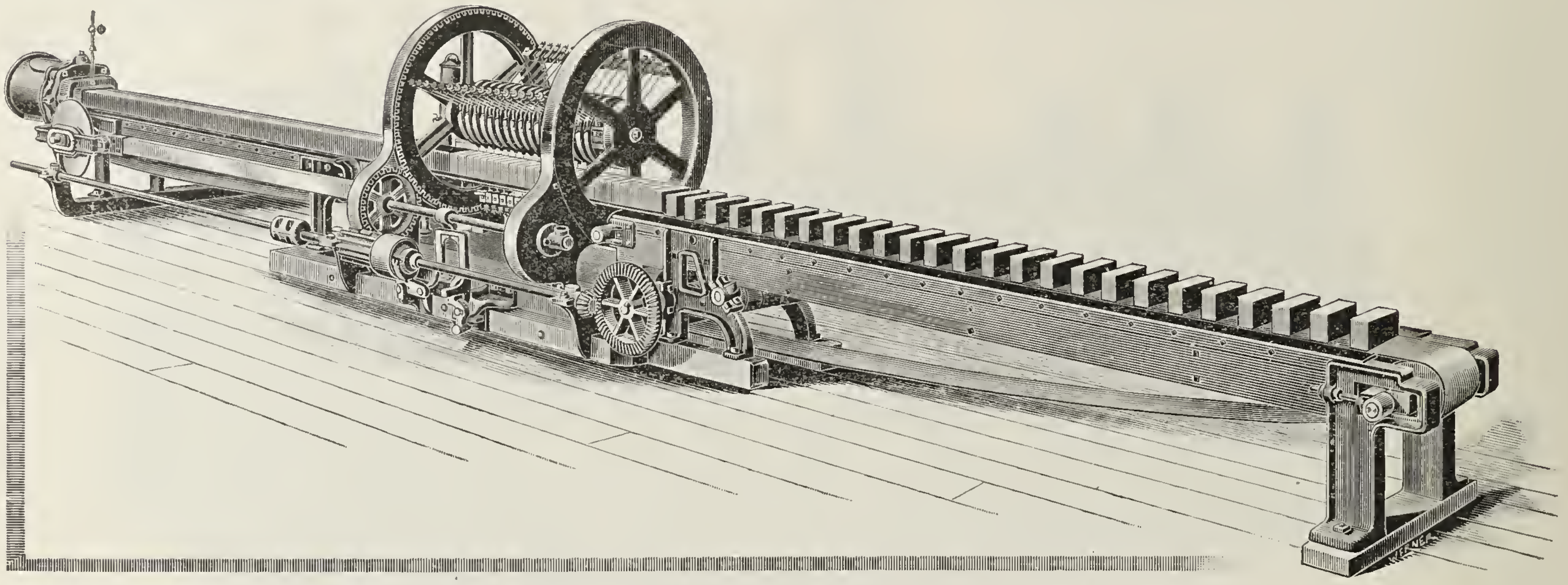
F. E. SWIFT,

Send for Catalogue.

Washington, Iowa, U. S. A.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



A New Rotating Cutter for Side Cut Brick.

POINTS.

- Of simplest construction. Entirely automatic and positive in operation.
- A combined downward and lateral movement of the wires insures brick with **smooth edges.**
- The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
- Cutting wires are short and make a square and straight cut.
- New wires easily put on without stopping, stooping or poking end of wire through a hole.
- More than twice as much time is afforded for renewing wires as in other cutters.
- Movement of all parts is slow.
- Clay does not propel cutting wires.
- No auxiliary or friction belts used.
- No tensions to regulate.
- No regulation or adjustment required.
- No crank or pitman rod used.
- No reciprocating wire frame used.
- No machinery underneath.
- Absence of all complicated gearing.
- Cannot miss a cut or cut a crooked brick.
- All the brick are of the same thickness.
- Substantial and durable in all parts.
- Capacity ample for any brick machine.

THE CLAY-WORKER

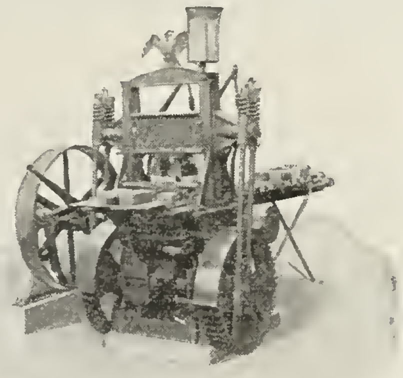
E. M. FREESE & CO.,
Galion, Ohio.

Birds of a Feather Flock Together.

THAT'S why the American Eagle, the best repress manufactured, is among its own kind when surrounded by our other Clay-Working machinery. They all give satisfaction because they possess the best principles, honestly and exactingly backed with good material and excellent construction. There is more profit in operating our machinery for the manufacture of Clay Products than any other line, because of their general superiority, their capacity for excellent output and their freedom from flaws and faults. We build machines for the manufacture of Clay Products by all known processes. Particulars for a postal. Our new catalogue is yours for the asking.

Auger Brick Machines.
Auger Tile Machines.
Automatic Brick Cutter and Separators.
Automatic Tile Cutter and Separators.
Blunger Machine.
Brick Re-presses.
Bucyrus Steam Tunnel Dryer.
Buffing Machines.
Clay Washing Machinery.
Clay Disintegrators.
Clot-making Machines.
Clay Granulators.
Clay Steamers.
Combined Auger Machine and Pug Mill.
Corrugated Crushers and Separators.
Clay Grinding Machines.
Disintegrators and Crushers Combined.
Double-working Steam Presses.

MANY USERS SAY THE EAGLE DOES MORE THAN WE PROMISE.
NONE SAY IT DOES NOT DO ALL THAT WE PROMISE



ALL OUR MACHINES HAVE RECORDS EQUAL TO THE EAGLE.

Double Chaser Machines.
Dry Cars.
Dry Pans.
Dump Cars.
Wet Pans.
Filter Presses.
Hand-power Brick Presses.
Hand-power Screw Press.
Horse-power Brick Machines.
Ornamental Hollow Block Machinery.
Packer Plunger.
Plunger Brick Machines.
Plunger Tile Machines.
Press Brick Machnes.
Pug Mills.
Roofing Tile Machines.
Reduction Mills.
Sewer Pipe Presses.
Sifter Screen.
Sizing Machines.
Slip Pump.
Terra Cotta Machines.
Upright Stock, Sand Mould Brick Machines.

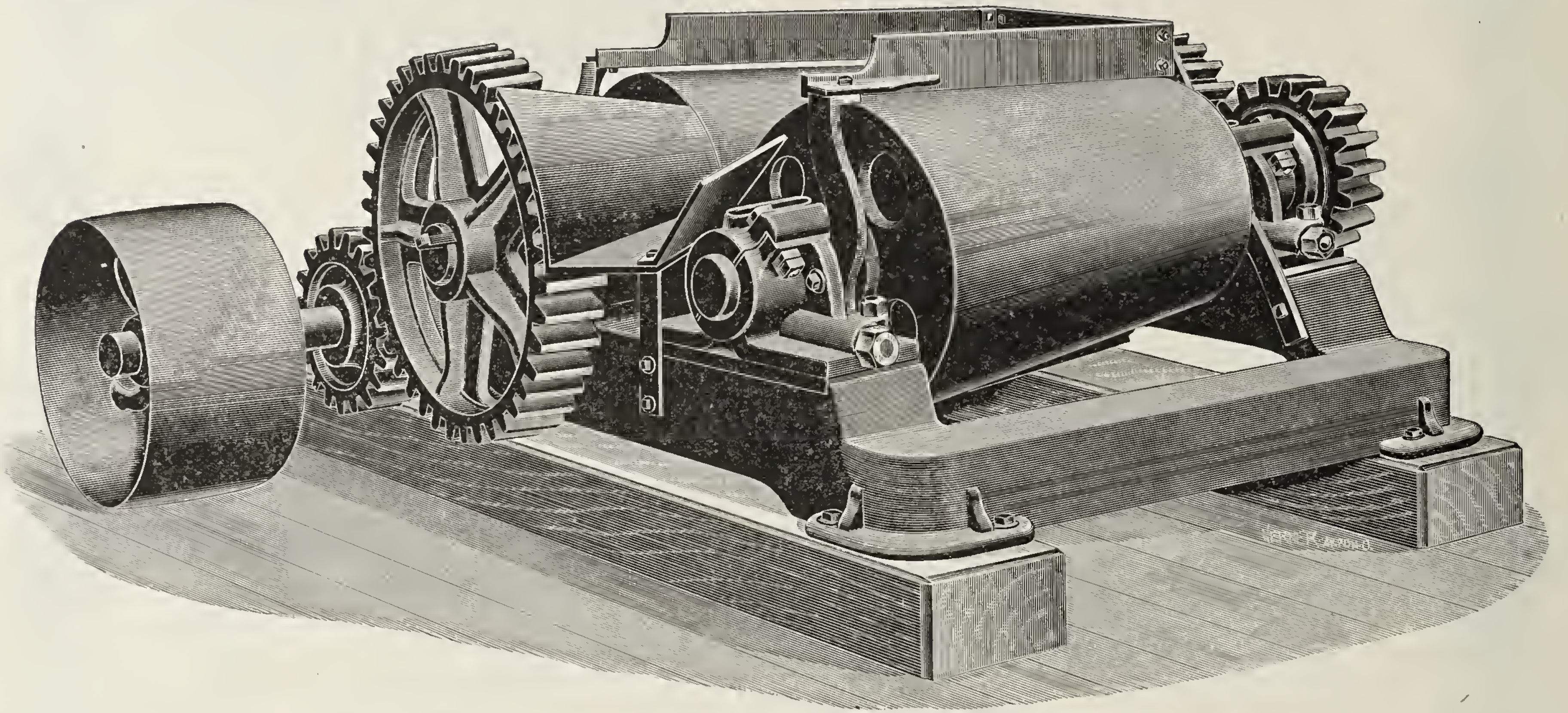
Write us f pecial achinery and Prices. Correspondence Solicited.

THE MACHINERY THAT NEVER DISAPPOINTS

The American Clay-Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.

A CRUSHER THAT CRUSHES.



STONE EXTRACTING CLAY CRUSHER.

The crushing is done by smooth, tapering rolls, thoroughly chilled, with diameters respectively of 18 inches and 22 inches at the ends and 32 inches long. These rolls are secured to shafts four inches in diameter and run in journal boxes 9½ inches long. The base or bed frame is cast in one solid piece, making the machine firm and rigid.

The cut does not show a transverse crushing roll attached, but where there is a a lumpy clay, making such a roll desirable, it can be furnished.

WHAT A USER SAYS.

Rome, Georgia.

Messrs. H. Brewer & Co., Tecumseh, Mich.

Gentlemen—We have been using your Elevator and Roll Crusher for four months. The Elevator does the work nicely, carrying the clay from the Crusher to machine.

The Crusher is a complete success. The clay is crushed completely and without laminating. It falls from the rolls on the Elevator in a loose mass, resembling disintegrated clay. The stones are separated from the clay and deposited at the end of the Crusher. Our clay has a deposit of smooth flint rocks, varying in size from that of a bird's egg up to a goose egg and some larger. These are all taken out.

We are waiting anxiously for the two additional Crushers and Elevators ordered from you, and hope to have them in operation soon.

Yours truly, ROME BRICK CO.
Per Camp, Pres.

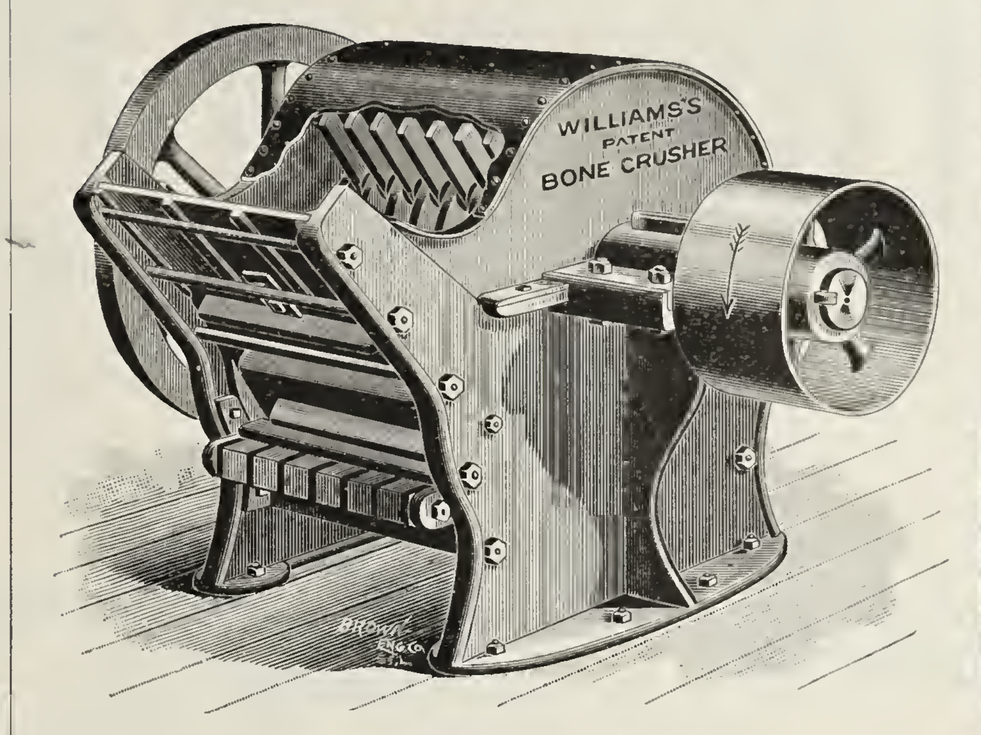
Write for Information.

H. BREWER & CO.,
TECUMSEH, MICH.

The Williams
Patent
Crusher &
Pulverizer
Company,

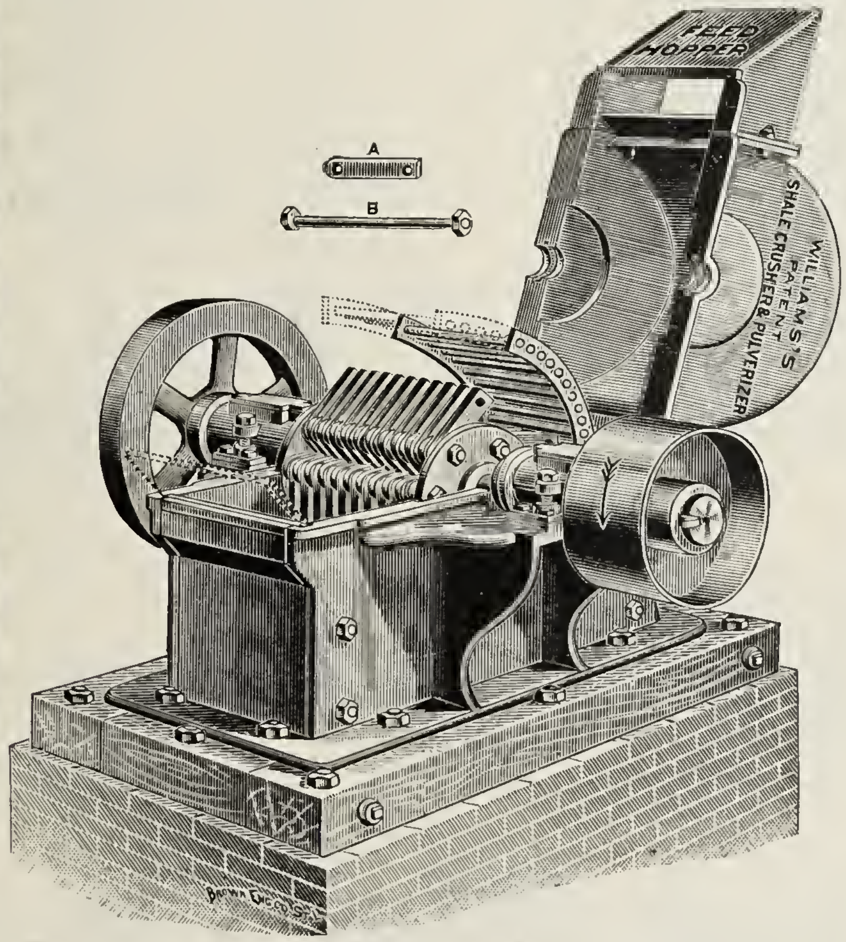
OF

ST. LOUIS, MO., U. S. A.



Williams's Shale Breaker.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee to also double the output. . . . . . .



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

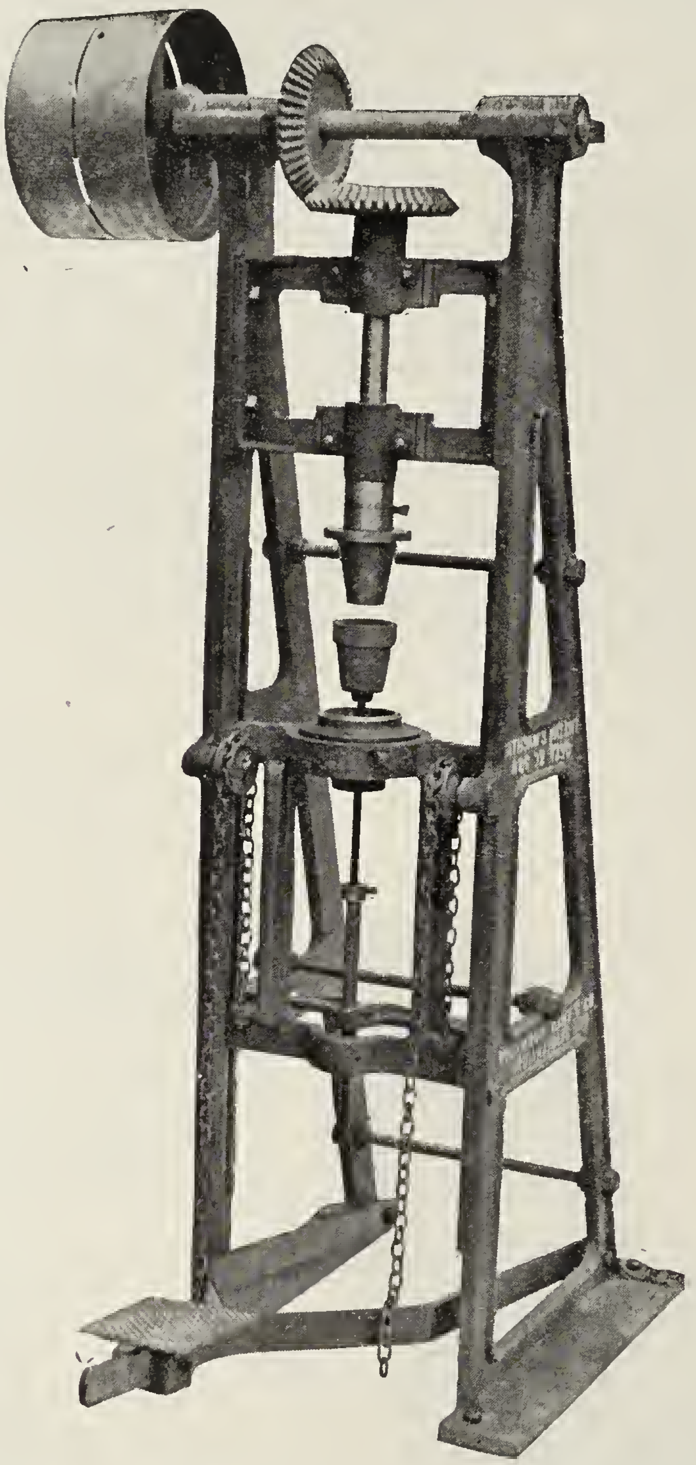
FOR FURTHER INFORMATION
WRITE TO ✤✤✤✤✤✤✤✤✤✤✤

The Williams
Patent
Crusher &
Pulverizer
Company,

ST. LOUIS, MO.,
U. S. A.

THE ONLY SUCCESSFUL FLOWER POT MACHINE.

(PATENTED.)



Capacity in Ten Hours:

6,000,	2 inch	Pots.
4,500,	3 "	"
3,500,	4 "	"
2,500,	5 "	"
2,000,	6 "	"
1,500,	7 "	"

Makes Better and Cheaper Pots than can be Made by Hand. Does not Require Expert Workmen.

Write for Circulars and Prices.

The Rockwood Mfg. Co.,

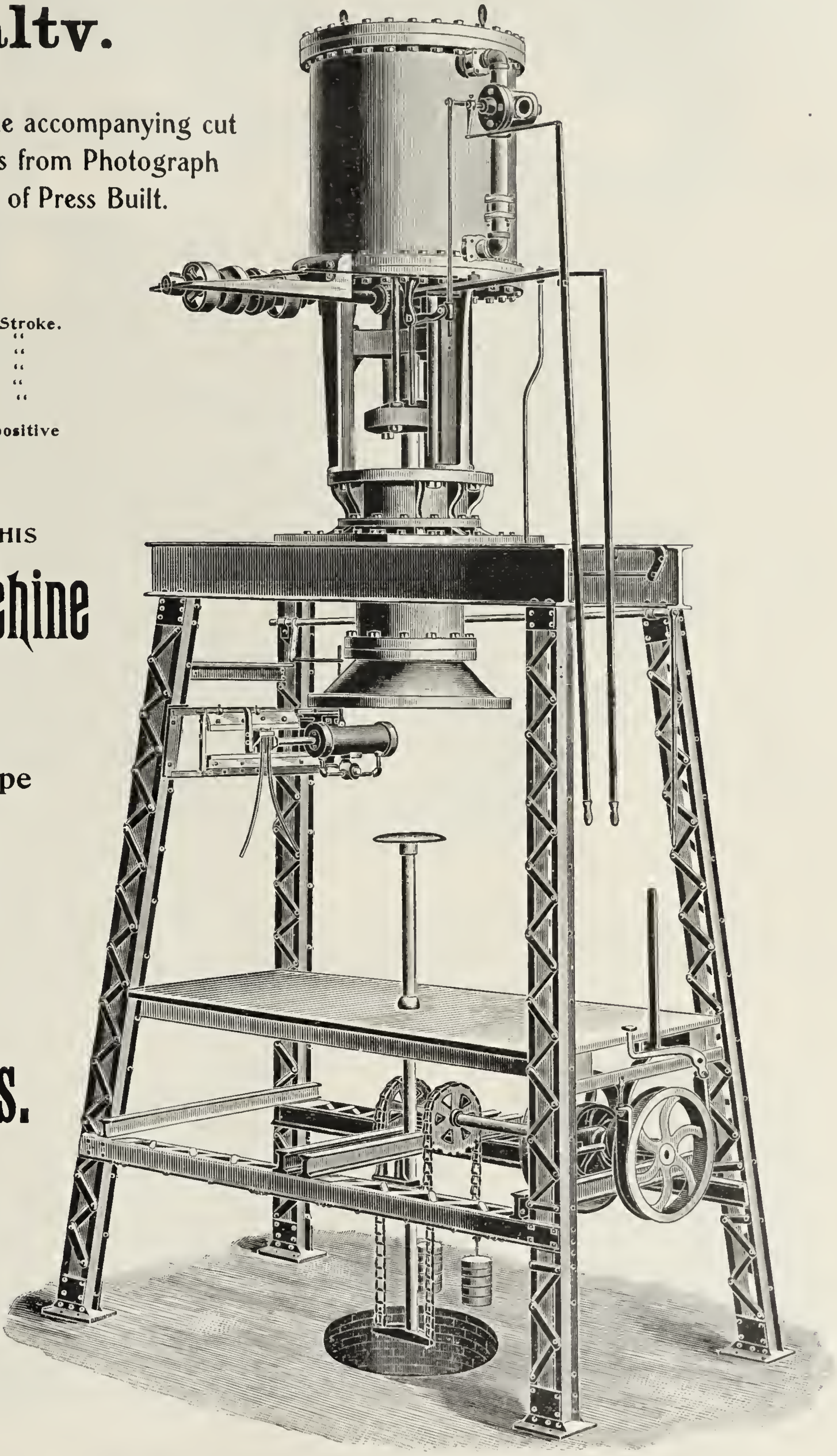
No. 332 South Pennsylvania St. *INDIANAPOLIS, IND., U. S. A.*

SEWER PIPE AND TILE MACHINERY,

Our Specialtv.

The First Machine of this Type was manufactured for Montague & Co., Chattanooga, Tenn., November 1897. . .

The accompanying cut is from Photograph of Press Built.



DURING THE PRESENT YEAR
WE HAVE BUILT THESE SIZES:

44	in. Steam Cylinder,	20	in. Clay Cylinder,	42	in. Stroke.
44	" "	20	" "	50	"
48	" "	22	" "	48	"
48	" "	24	" "	48	"
52	" "	24	" "	48	"
52	" "	26	" "	60	"

All the above are in successful operation and are positive witnesses of their Excellence.

◆

WRITE US FOR DESCRIPTION OF THIS

Strictly Up-to-Date Machine

◆

To make the Most Pipe
—AND—
To make the Best Pipe

BUY THIS MACHINE
OUR DIES. . . . .

◆

LET US TELL YOU OF OUR

Steele Frame,
Ball=Bearing

DRY AND WET PANS.

DON'T EXPERIMENT
WITH UNTRIED MACHINES.

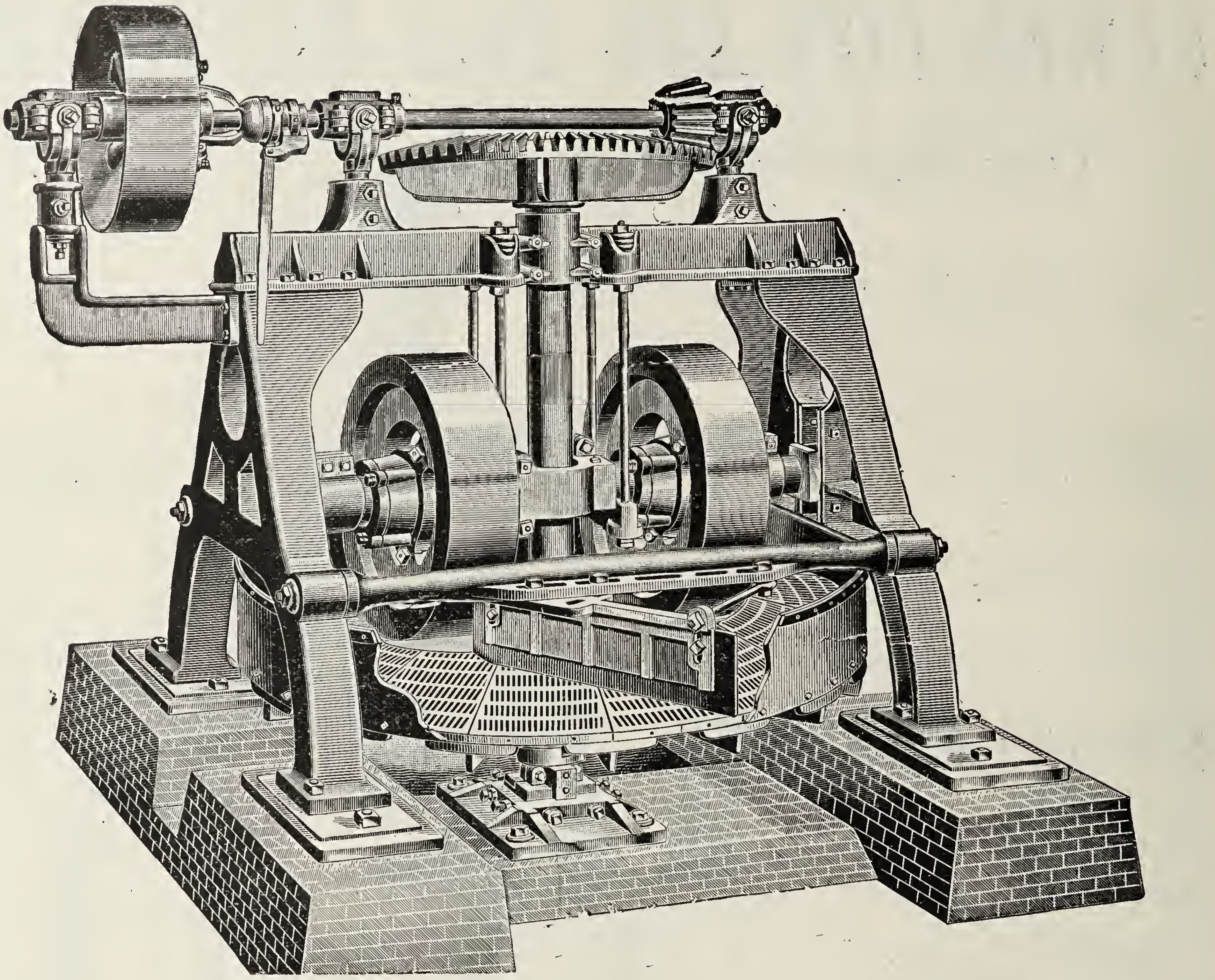
"Be Sure You're Right, then Go Ahead."

◆

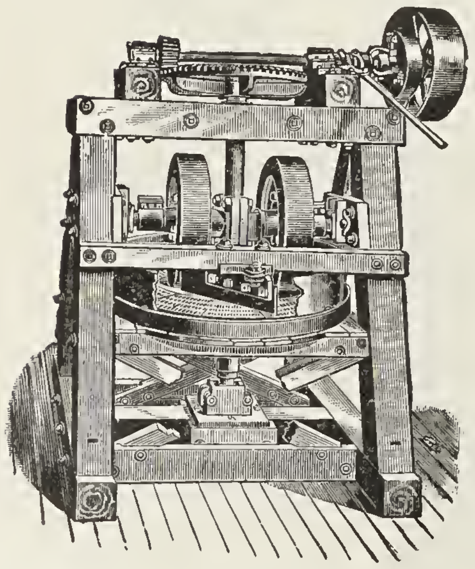
Our Pottery Machinery
Is Unequalled.

MANUFACTURED BY

TAPLIN, RICE & CO., AKRON, ...OHIO.

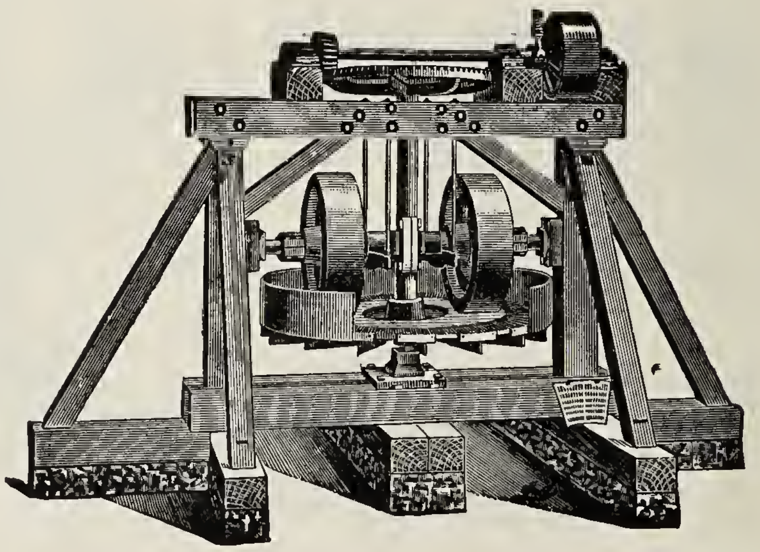


OUR SPECIALTY IS DRY PANS.



IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



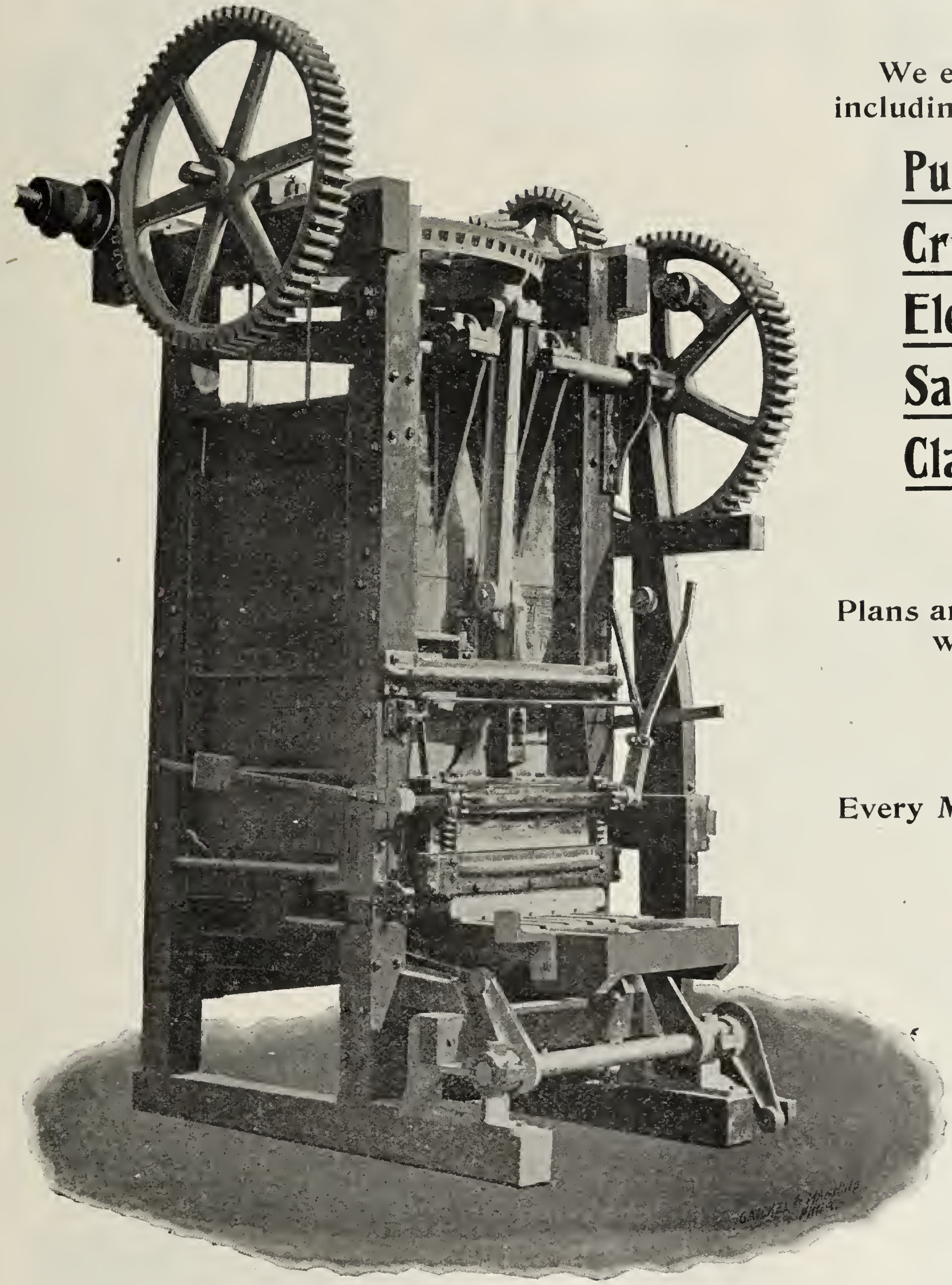
......SEND FOR NEW ILLUSTRATED CATALOGUE......

FROST ENGINE CO., Galesburg, Ill., U. S. A.

1857-- 32 YEARS OF UNPARALLED SUCCESS --1899

FOR THE

"Martin" Brick Machinery.



We equip complete plants including

Pug Mills,
Crushers,
Elevators,
Sanders,
Clay Screens, Etc.

⁂

Plans and Specifications will be furnished Free of Cost.

⁂

Every Machine sold under a Guarantee.

⁂

Before placing your order elsewhere Write to us.

⁂

We cheerfully answer all Inquiries.

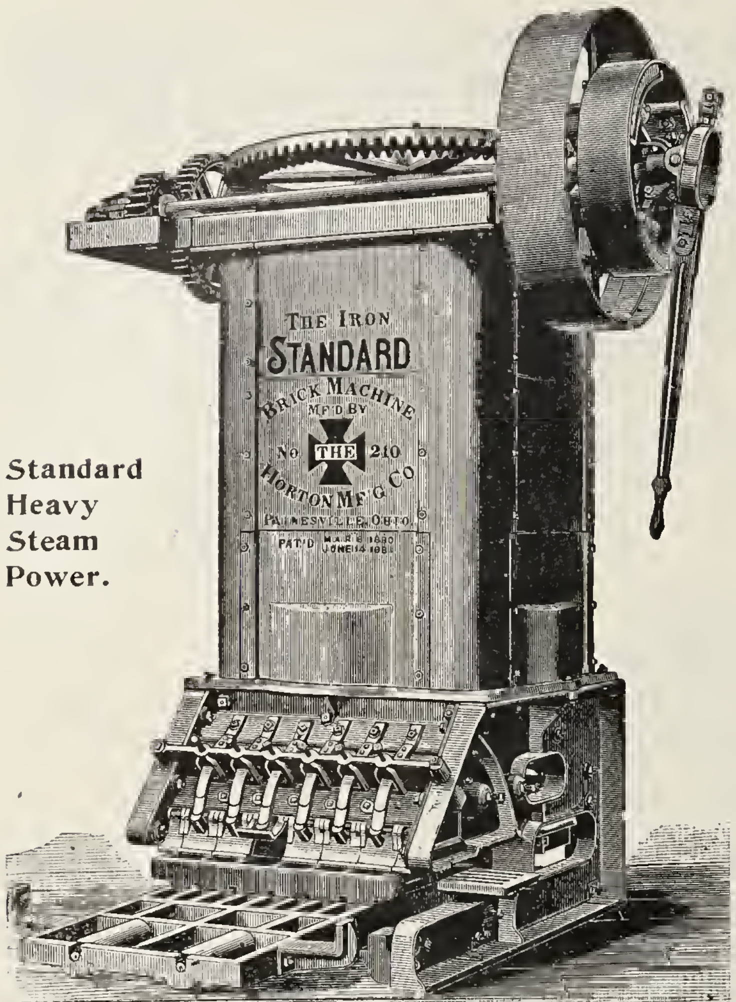
Send for our General Catalogue.

THE HENRY MARTIN BRICK MACHINE MFG. CO.,

INCORPORATED. LANCASTER, PA., U. S. A.

We Lead! Others Follow!

• • •



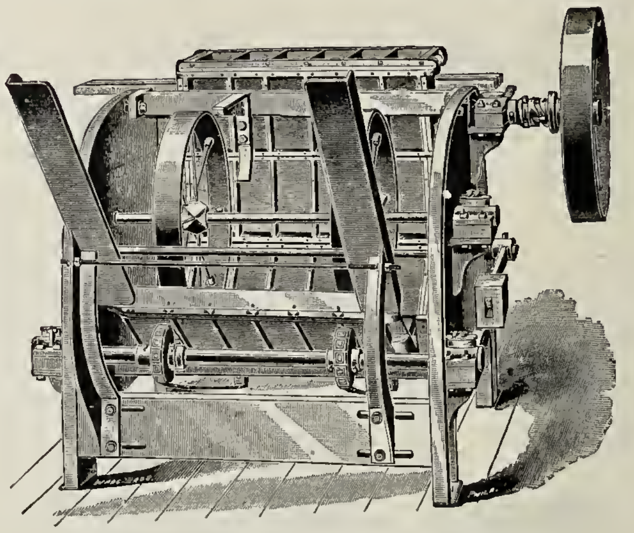
Standard
Heavy
Steam
Power.

The Hercules!

Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

The Standard Machine is just what its name implies.

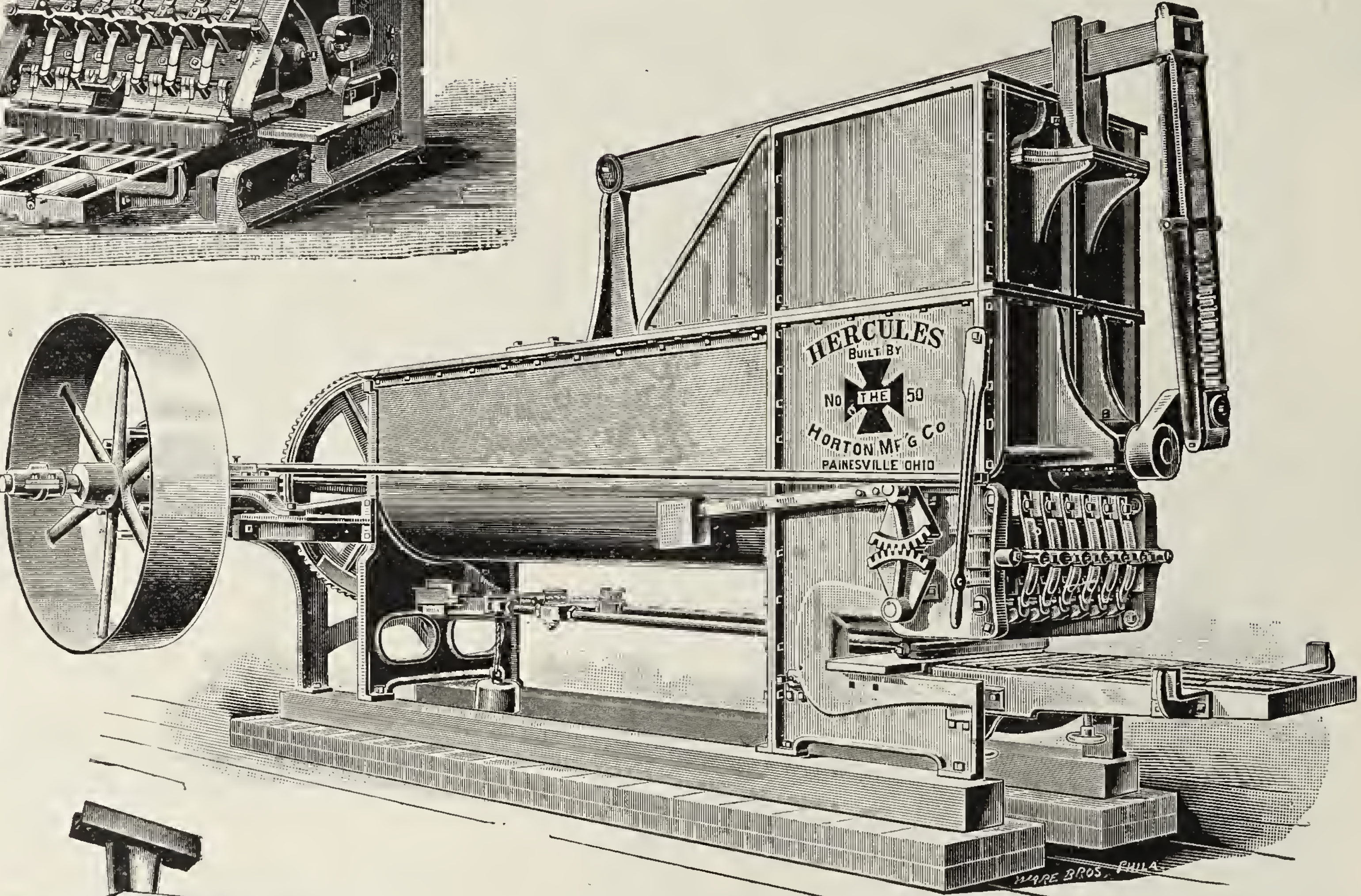
SEND FOR
1899 CATALOGUE.



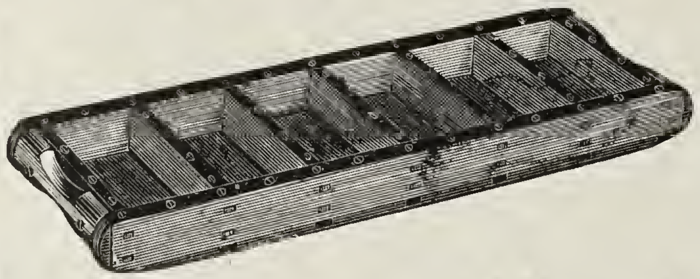
HORTON MOLD SANDER DIRECT FEED.

We are making a special drive on Molds this season. Send for our new circular on molds.

Hercules capacity 40,000 to 50,000.
Weight 15,000 pounds.



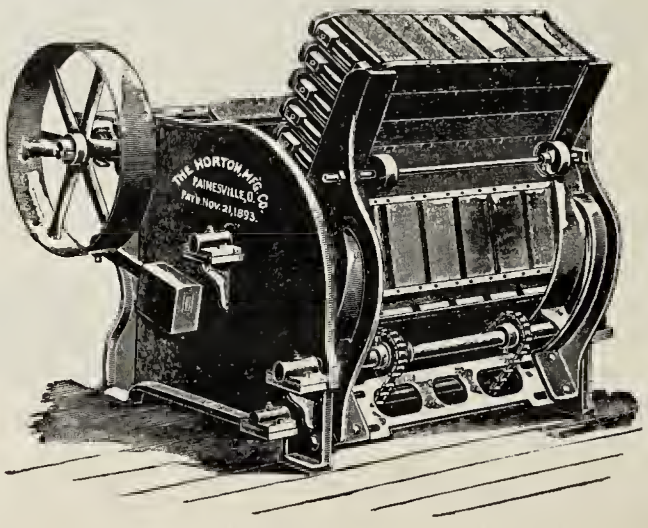
IRON STANDARD HORSE POWER.



WE HAVE recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.

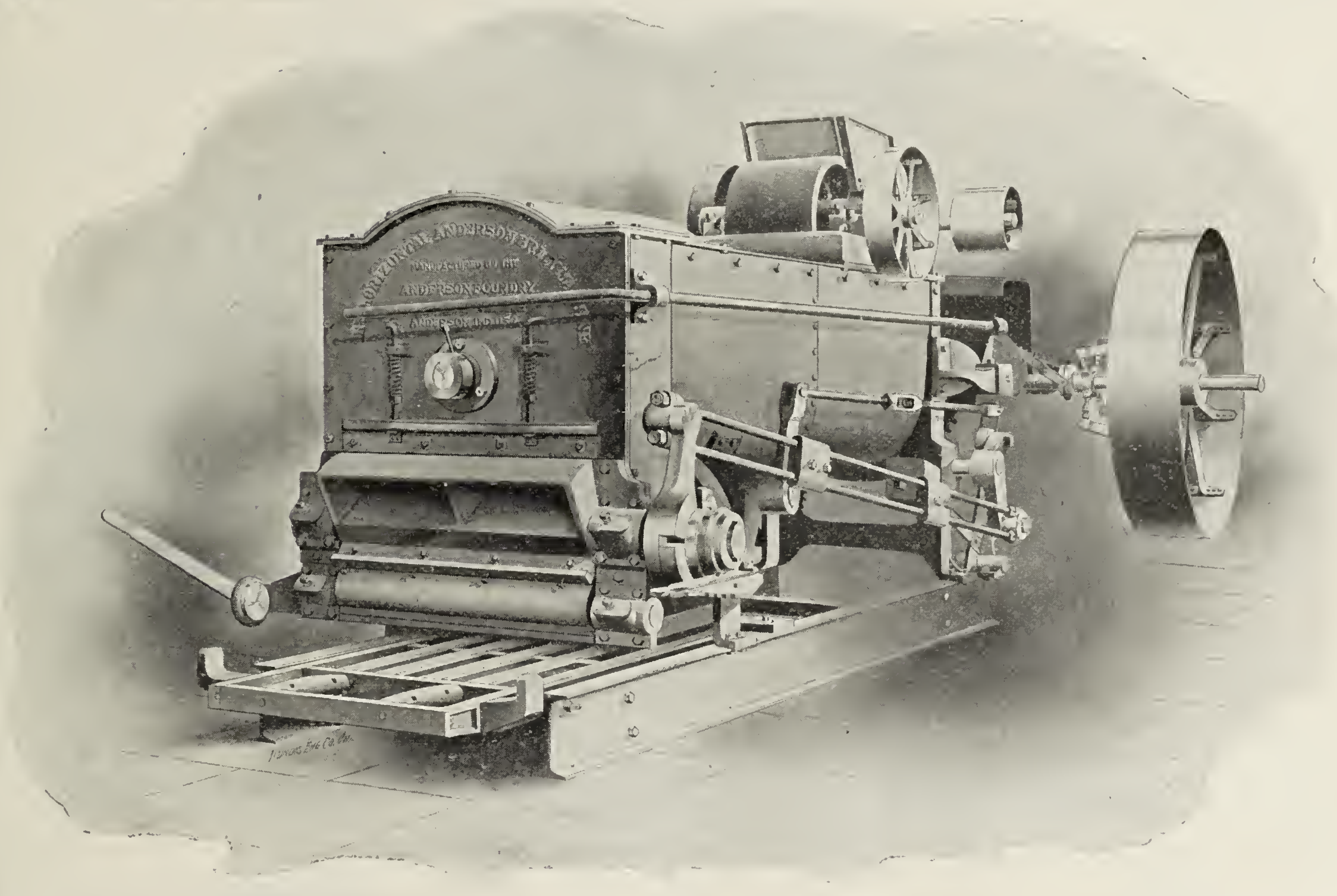
The HORTON MANUFACTURING COMPANY,

PAINESVILLE,
OHIO.


The Horton Mf'g Co.
Painesville, O.
Pat'd Nov. 21, 1893.

THE AUTOMATIC FEED MOLD SANDER.

Combined Horizontal Anderson Brick Machine and Disintegrator.



Manufactured by

The Anderson Foundry and Machine Works,

ANDERSON, INDIANA.

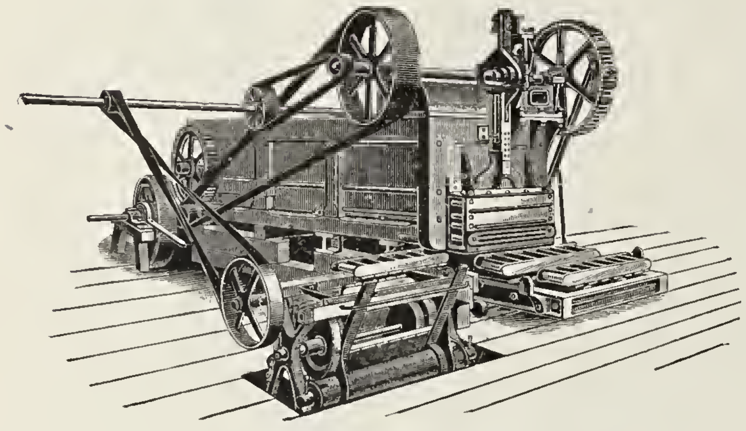
DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the best, namely,

··THE··

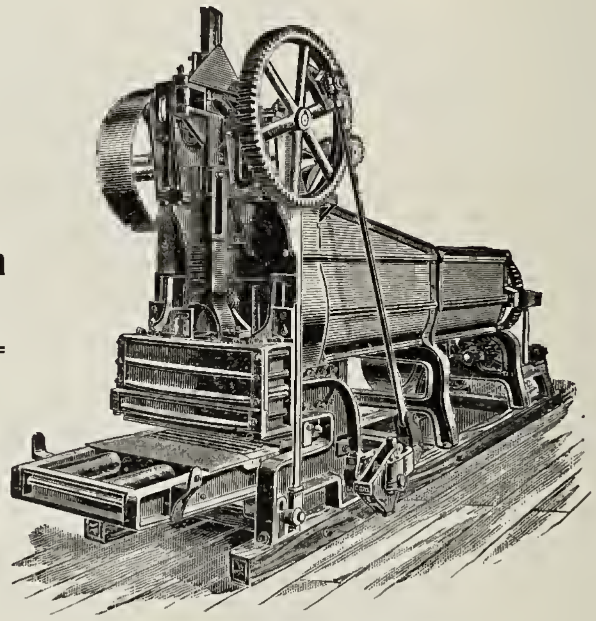
POTTS Horizontal Stock Brick Machine

They do all Claimed for Them. You take no chances of an Experiment.



Wood Pug Mill.

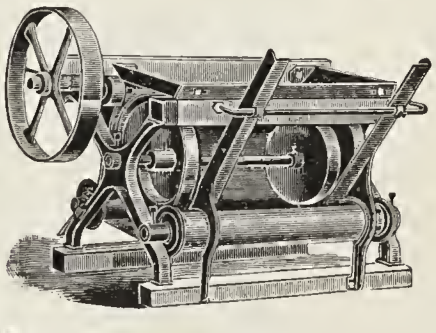
They have no equal for making Brick which have Clean, Sharp Corners and Smooth Surfaces.



Iron Frame Pug Mill.

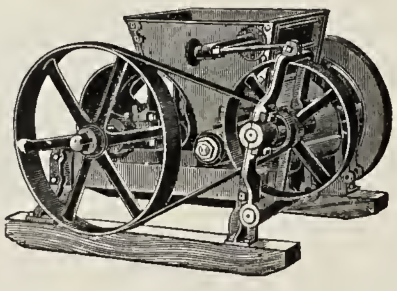
They are the only machines which will work the clay direct from the bank without the use of an extra Pug Mill.

They are **Simple in Construction, Strong and Durable.** Every machine guaranteed to do as claimed for it.



Mould Sanders,

Which have no equal for sanding the moulds, no light complicated parts to wear or break. They do not waste or spill the sand. Guaranteed to do all claimed for them.



Disintegrators,

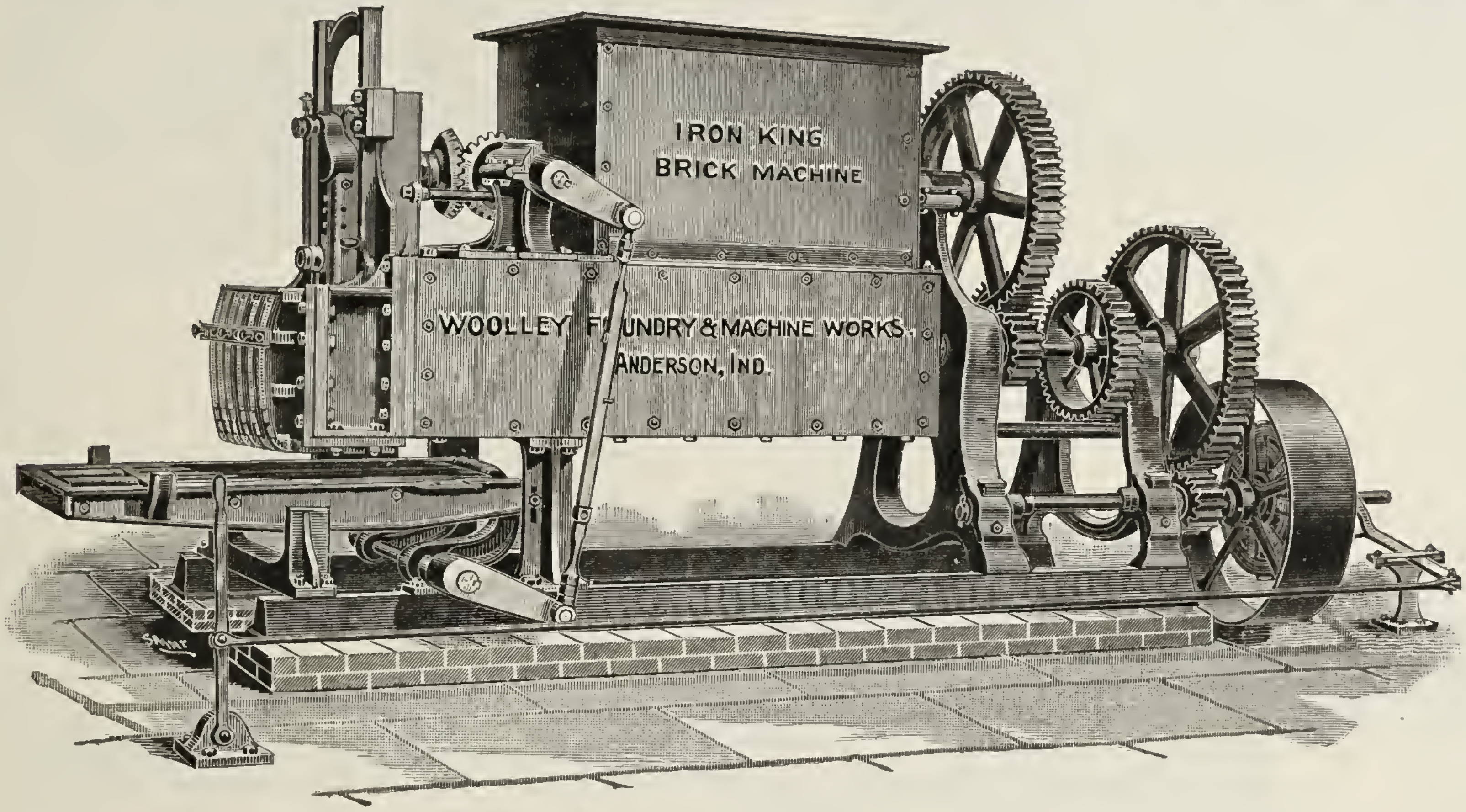
Built of good material, strong and durable. They do the work claimed for them, built in a number of sizes to suit any yard.

For terms and prices of anything needed on the brickyard write

C. & A. POTTS & CO., 814 to 824 W. Wash. St., **INDIANAPOLIS, IND.**

SUCCESS.

IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good.**


IRON KING
BRICK MACHINE
WOOLLEY FOUNDRY & MACHINE WORKS.
ANDERSON, IND.

A Brick Machine that Never Made a Failure.

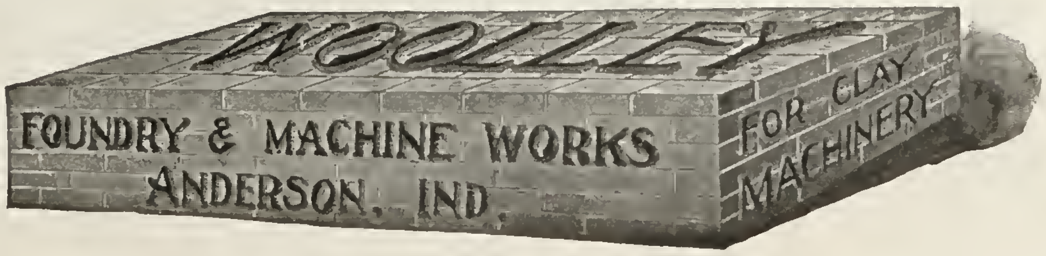
Our "**IRON KING**" Brick Machine is made on correct mechanical lines and of material that will "stand the racket" right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

WOOLLEY DRY PANS, PUG MILLS, SLIP PUMPS and PRESSES

Are all made for hard service. If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US
PLEASURE TO QUOTE
YOU PRICES. . . .

Mention the Clay-Worker.



The N. B. M. A. met this month in Ohio. It was an interesting and profitable meeting. N. B. M. A. can be construed into something else beside "National Brick Manufacturers' Association." It could be translated this way:

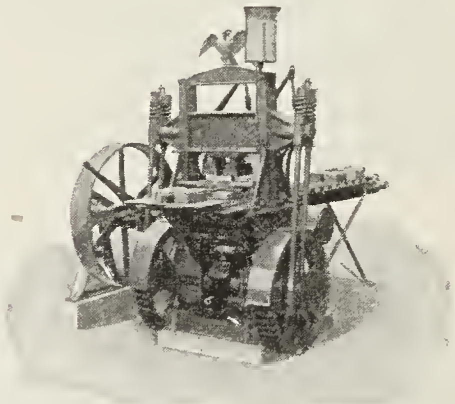
NO BETTER MACHINERY ANYWHERE

than

The Machinery that never Disappoints

This translation would be true for there is no better machinery than the American Line. It is built in Ohio, and in a manner worthy of the great state. No faulty material, no careless workmanship. Machines that are guaranteed to make more and better product than any other line. If you are in the market for any machinery or appliances used in any branch of the clay trade, write us for prices.

The American Clay-Working Machinery Co., BUCYRUS, OHIO, U. S. A.



TEN EAGLE REPRESSES
SOLD IN A SINGLE WEEK.
ISN'T THAT A GOOD
RECORD TO START
1899 WITH.

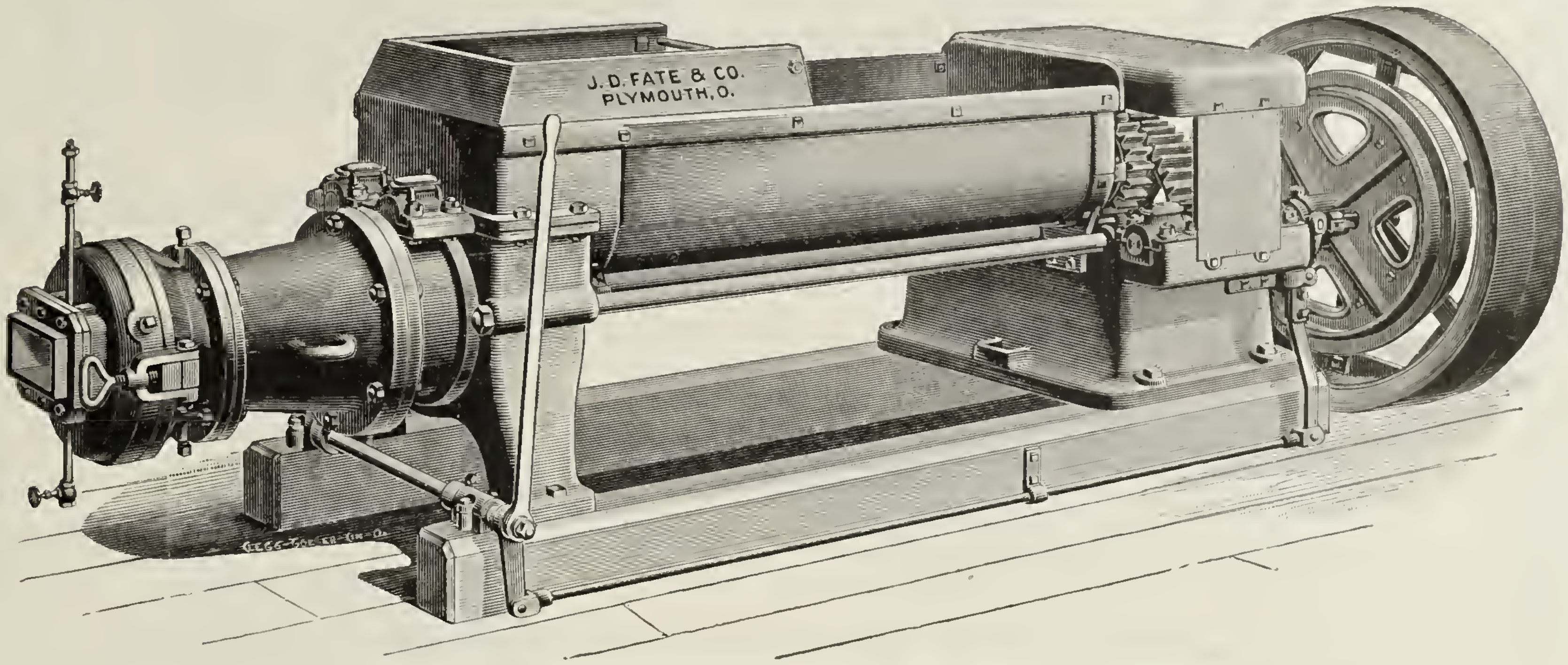
J. D. FATE & CO.,

Manufacturers of

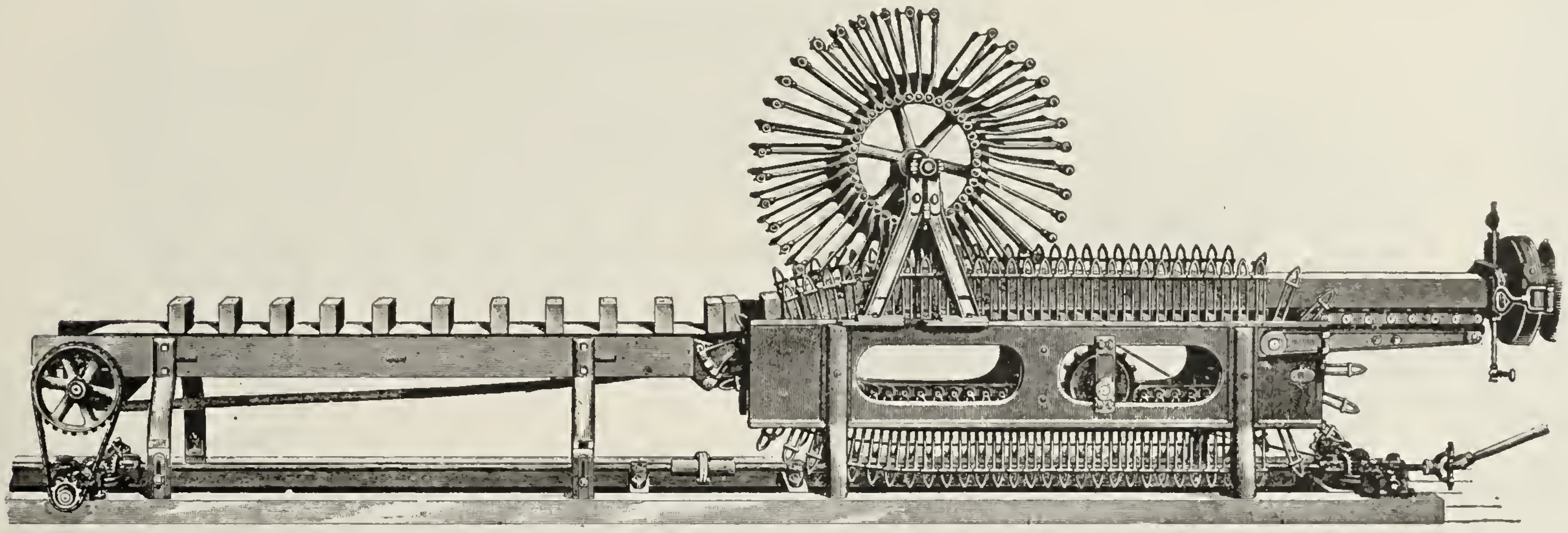
BRICK AND TILE MACHINERY.

PLYMOUTH, OHIO.

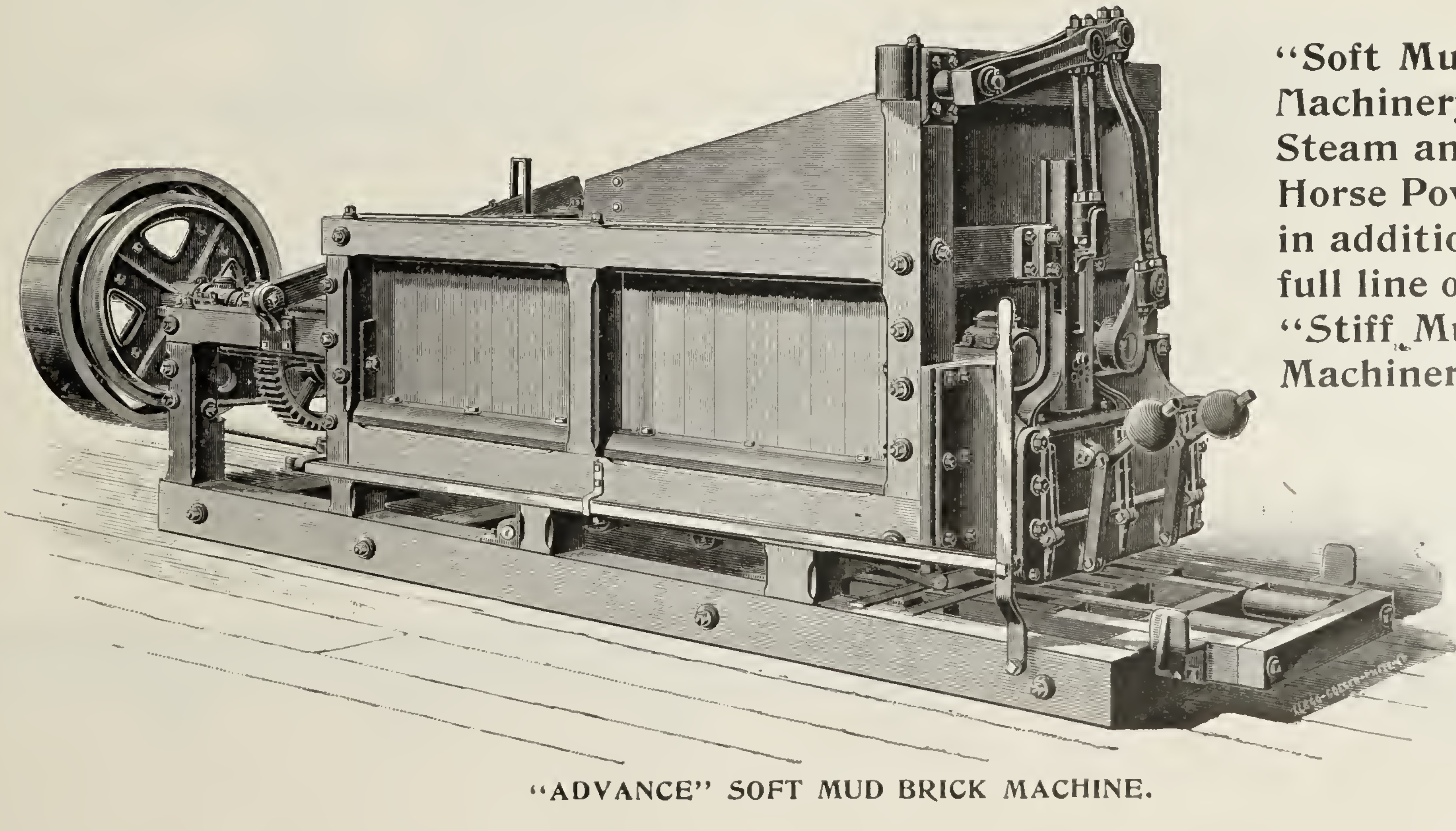
Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.


J. D. FATE & CO.
PLYMOUTH, O.

"HUMMER" COMBINED PUG MILL AND BRICK MACHINE.



BENSING'S AUTOMATIC SIDE-CUT BRICK TABLE.



"Soft Mud" Brick Machinery, both Steam and Horse Power in addition to our full line of "Stiff Mud" Machinery.

• •

ASK FOR CATALOGUE AND PRICES.

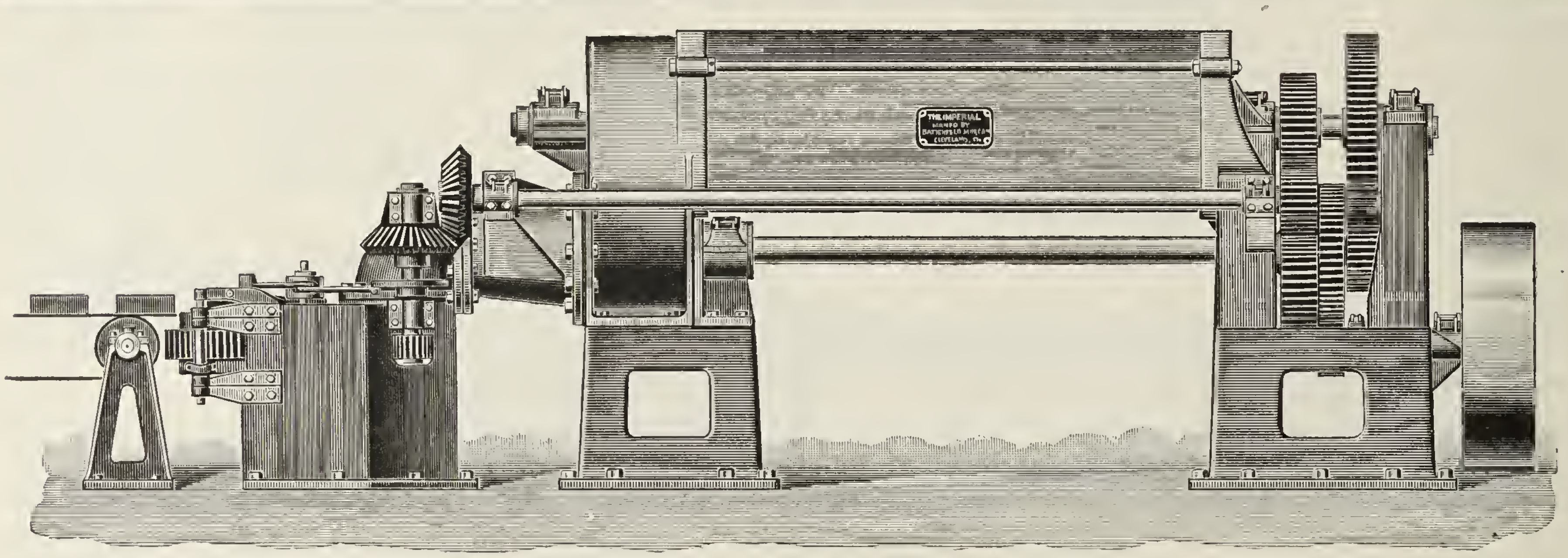
• •

"ADVANCE" SOFT MUD BRICK MACHINE.

"The World Revolves"

But Our New Imperial Brick Machine is Ahead of It. . . . . .

We take pleasure in bringing before the Brickmakers, our New and Perfect Brick Machine illustrated here. We feel justified in our claim that this machine has no equal, and will accomplish under one operation, at a less cost, a more perfect brick than any other Stiff Mud Machine ever produced.



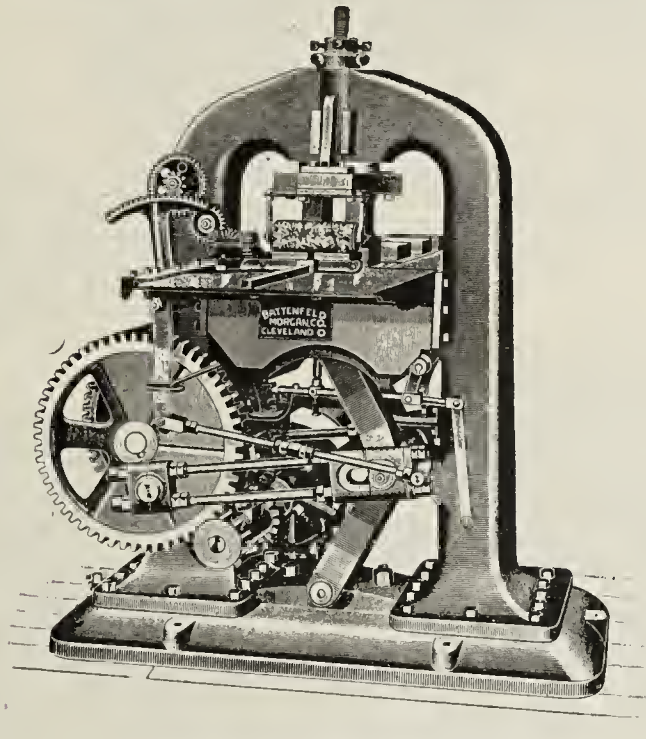
The Imperial Brick Machine.

If you are interested in a perfect Brick Machine, write to us for descriptive matter, and catalogue. We solicit your correspondence.

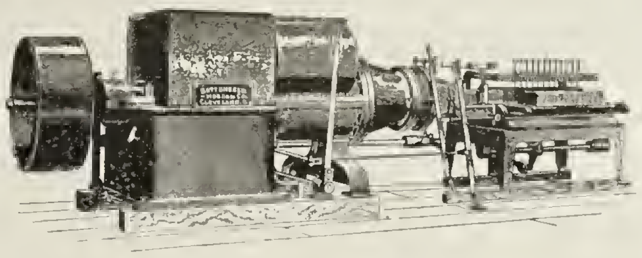
The Battenfeld-Morgan Co.

Manufacturers of Clayworking Machinery,
226 to 236 Abbey Street, CLEVELAND, OHIO.

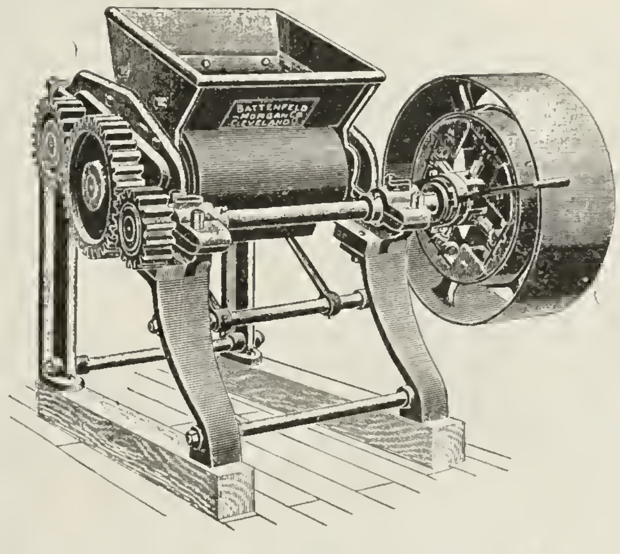
A Small Representation of Our Family.


BATTENFELD MORGAN CO. CLEVELAND O

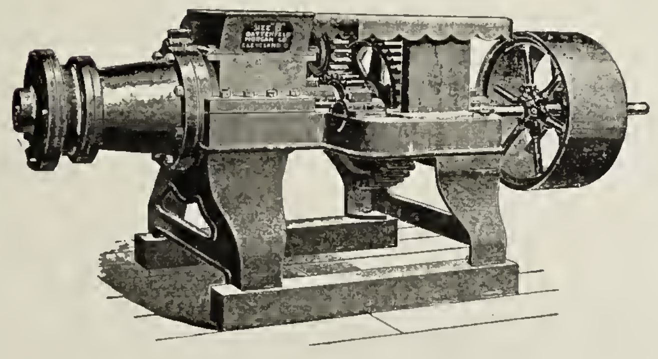
DOUBLE DIE REPRESS.



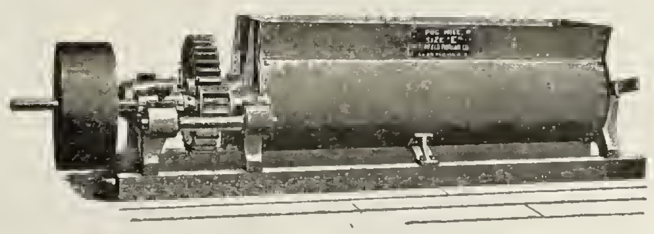
SIZE "AA." MACHINE.
Capacity 75,000 Brick per Day.


BATTENFELD MORGAN CO. CLEVELAND O

TWO ROLL CRUSHER, SIZE "A."



SIZE "B" MACHINE.



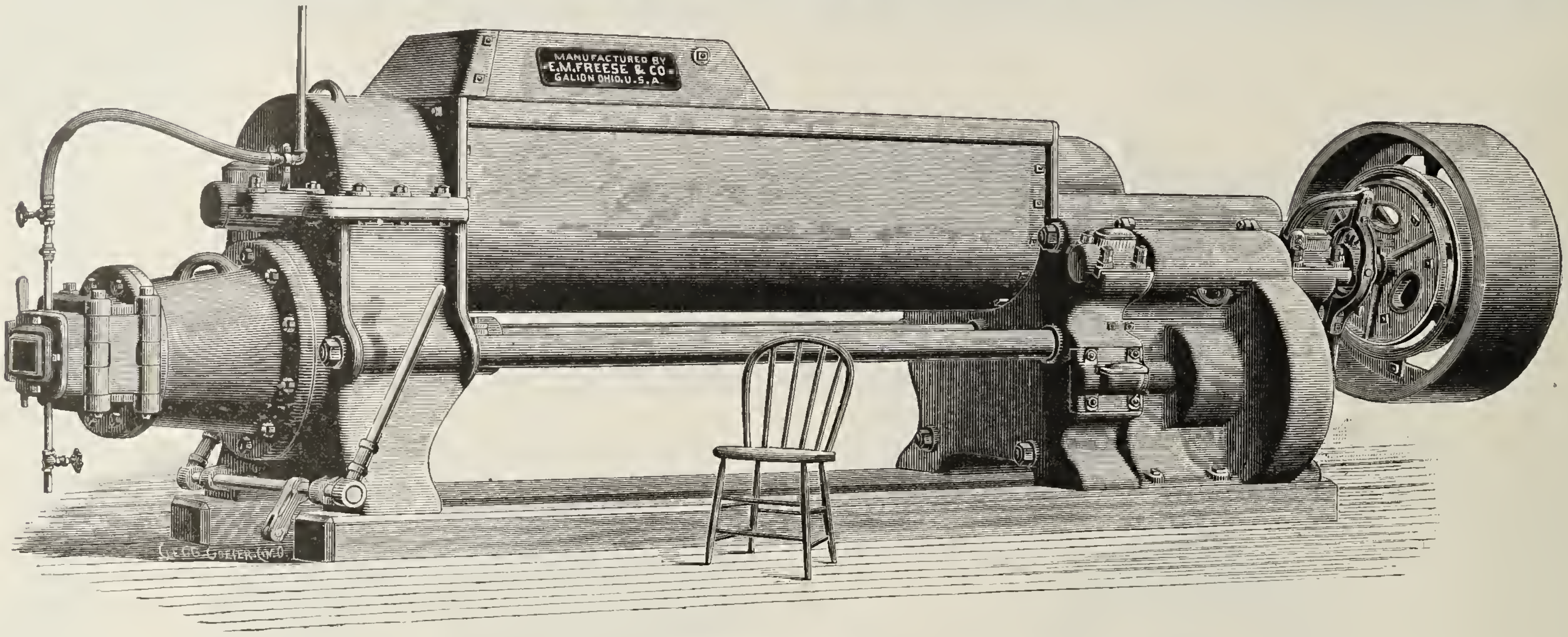
PUG MILL, SIZE "U."

The BATTENFELD-MORGAN CO.,

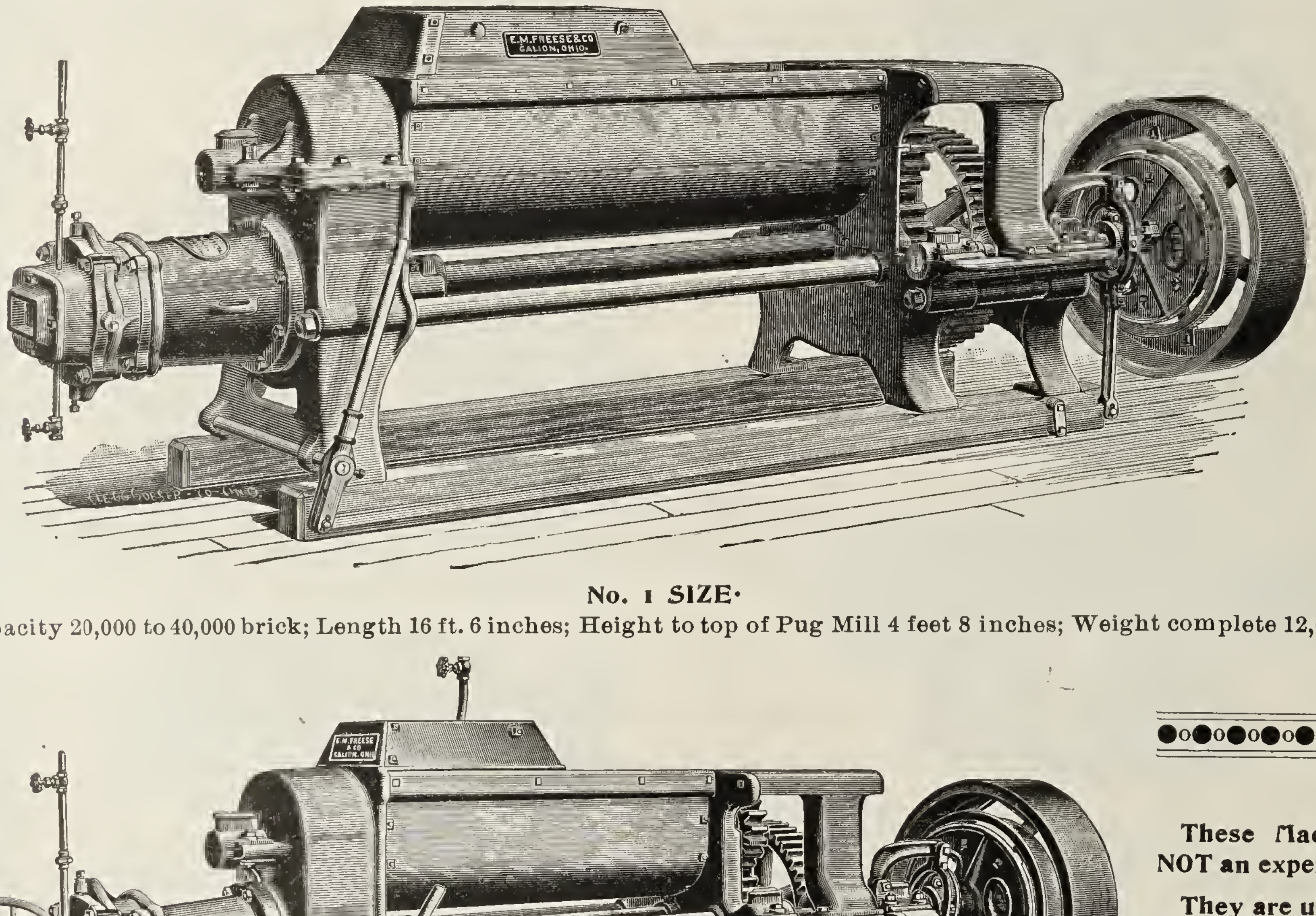
Manufacturers of Clayworking Machinery,

226-236 Abbey Street, CLEVELAND, OHIO.

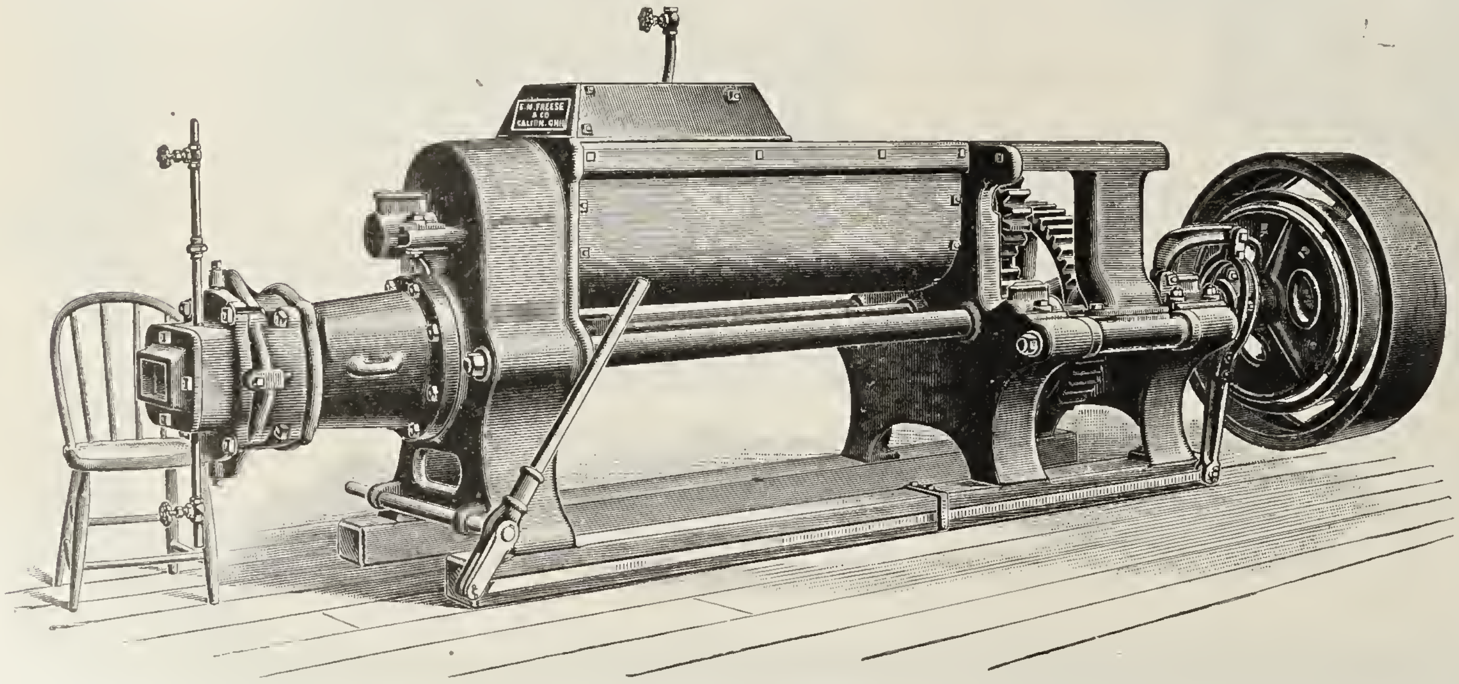
The Original Union Brick Machines


MANUFACTURED BY
E.M.FREESE & CO.
GALION OHIO U.S.A.

SPECIAL SIZE.
Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.
Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.
Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

E. M. FREESE & CO., Galion, Ohio.

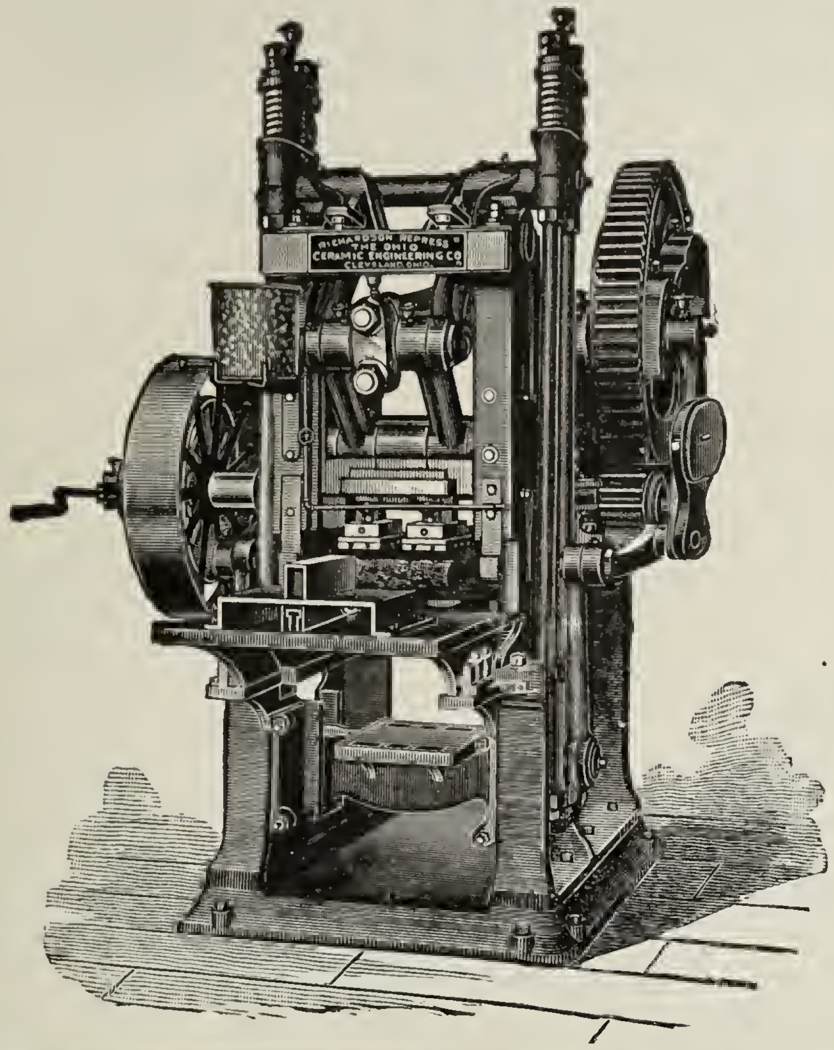
The Richardson Repress

possesses many features of special merit—In many respects it is superior to any other repress on the market—It is strong—durable—serviceable—and is *not* complicated.

It is not the most expensive Repress on the market—neither is it the cheapest. It *is* however worth in good hard dollars all that we ask for it.

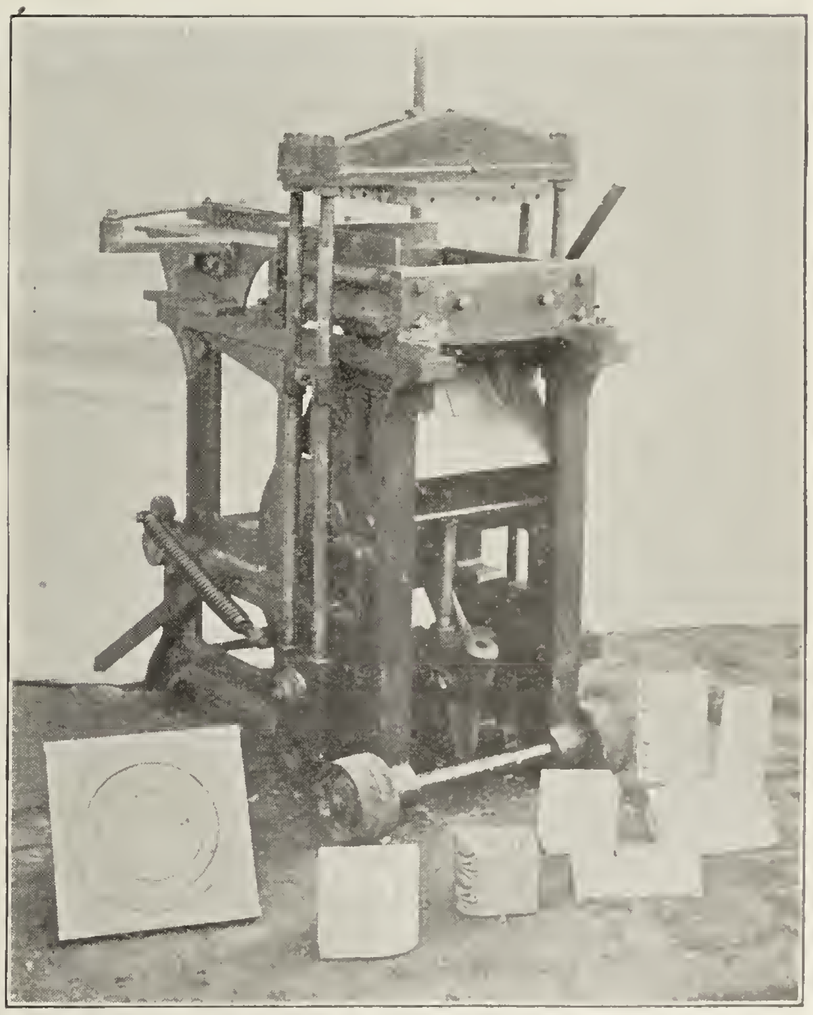
We are willing to place it in competition with any other Repress that we know of and let you be the judge. Fair isnt it?

We would be pleased to tell you all about this machine—either by sending a catalogue or a personal representative.



THE RICHARDSON REPRESS.

We desire to call your special attention to our New Improved Double Mold Hand Repress. This machine is the only Double Mold Hand Repress in the market. Works easier than the ordinary Single Mold Hand Represses—is easily adjusted—very durable—simple in construction—has capacity of 5000 to 8000 brick per day of ten hours. We will send you circulars telling all about it if you wish.



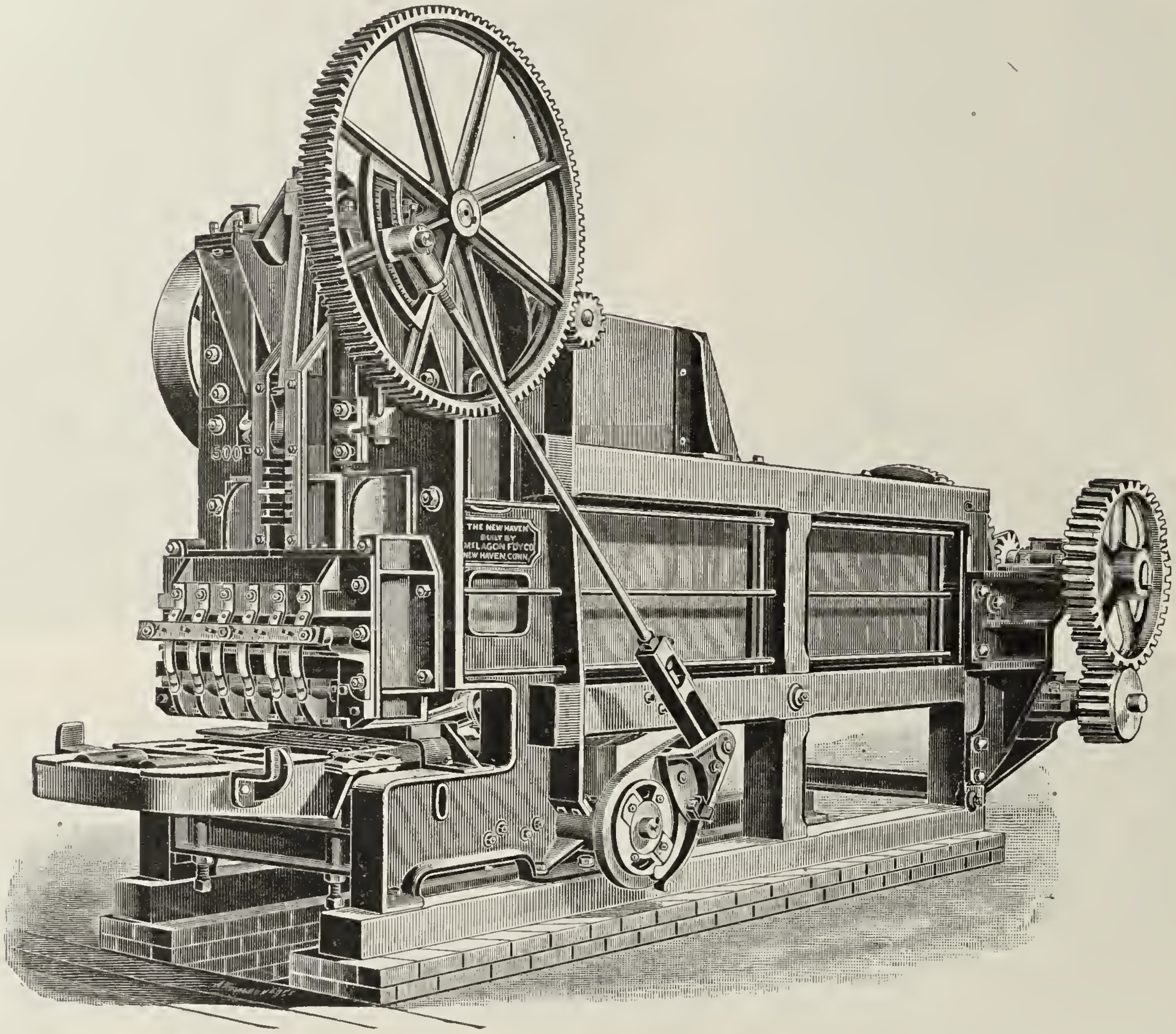
NEW IMPROVED DOUBLE MOLD HAND REPRESS.

THE OHIO CERAMIC ENGINEERING COMPANY,

CLEVELAND, OHIO.

Experience with Seven Machines

FOUR OF THEM ARE SIX YEARS OLD, THREE OF THEM THREE YEARS OLD.



15 Court Square.
Boston, Mass., Dec. 21, 1898.

The Eastern Machinery Co.,
Ashmun and Gregory Sts., New Haven, Conn.

Gentlemen—In reply to your letter of inquiry, we would say that we continue to think that the "New Haven" machine **is the best for our use**, and, as you know, we are running **seven of them**. We have no fault to find with amount of our repair bills, as **they are small**. The promptness with which you fill emergency orders for parts is another strong point in your favor.

We wish you continued success and with compliments of the season, remain,

Very truly yours,
BAY STATE BRICK CO.
H. P. Mallory, Treas.

We have many reports like the above from users of "NEW HAVEN" Machines. Write for some of them.

The Eastern Machinery Co.,

NEW HAVEN, CONN.

DO YOU WANT THE

BEST BRICK DRYER?

THE CUMMER DRYERS

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel, It is a fuel saver and hence a money maker.

If you want the best and most economical brick dryer don't fail to get our prices. If you want a cheap dryer, its no use to write us for we don't build that kind.

* * *

Read what H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE: 60TH AND HAVERFORD STS.
TELEPHONE 147, W. P.

H. C. CARROLL & SONS,

Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS:
57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country. Yours respectfully,

H. C. CARROLL & SONS.

* * *

The Cummer Clay Dryer is now in successful operation at many places in the United States. Like our brick dryer it is fully guaranteed to perform its work in the most effective manner possible and in any desired capacity. The **Cummer Dryer** succeeds where others fail. It will afford us pleasure to demonstrate its superiority over all other dryers.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell you troubles to"

The F. D. CUMMER & SON CO.,

CLEVELAND, OHIO.

American Blower Company

BRICK DRYERS

Let us introduce you to a few of our friends:

Harbison & Walker, Pittsburg, Pa.
Booth & Flinn, “ “
A. M. Entress, “ “
Reese, Hammond & Co., Bolivar, Pa.
Basic Brick Co., Johnstown, Pa.
A. G. Collom, Germantown, Philadelphia, Pa.
F. Seitter's Sons, “ “
R. C. Remmey & Son, “ “
James E. Dingee Estate, “ “
Gunn Bros., “ “
Philadelphia Brick Co., “ “
Jos. L. Siner, “ “
Flood Bros., “ “
Wm. F. Albrecht, “ “
W. A. Morin, Albert Lea, Minn.
Frederick Brick Works, Frederick, Md.
Chattahooche Brick Co., Atlanta, Ga.
J. M. Rumbaugh Brick Co., Greensburg, Pa.
Covington Improvement Co., Covington, Va.
C. E. Magers, New London, Ia.
R. G. Eisenhart, Horseheads, N. Y.
Washington Brick, Tile & Terra Cotta Co.,
Washington, D. C.
John A. Schmitt, Wilkes Barre, Pa.
Woodland Fire Brick Co., Woodland, Pa.
Trenton Fire Clay & Pottery Co., Trenton, N. J.
Albright Brick Co., Norristown, Pa.

AMERICAN BLOWER COMPANY,

DETROIT, MICH.

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THE CLAY WORKER
A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS.
INCLUDING BRICK TILE TERRA COTTA SEWER PIPE POTTERY ETC.
T. A. RANDALL & CO. PUBLISHERS.
CHANDLER SC. INDPLS.

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXI, No. 3. INDIANAPOLIS, IND., MARCH, 1899. $2.00 a Year in Advance.

THE

CHAMBERS MACHINE CONTRACT

IS ALWAYS A SAFE PROPOSITION FOR THE BRICKMAKER.

It is short and to the point. Provides in simple language that the machine is to be sent to the intending purchaser **for purpose of trial.** Whether accepted or not, purchaser pays the freight one way, and is liable for loss or damage from fire while machine is in his possession, but aside from this his liability when dealing with us is simply to load machine on cars at his works and ship to our order, if during trial the machine has failed to meet his requirements. The terms of payment, amount to be paid in event of purchase and expected product are mutually agreed upon and written in the contract before machine is shipped, **but we recognize the customer alone as the proper judge of performance.** We will do our best to please him, but failing in that, don't require him to purchase our machine.

During the past twenty years, only six Chambers Machines failed to meet with acceptance after trial. Two of these were experiments, out of the ordinary line, and four were clean failures.

FOUR MACHINES REJECTED IN TWENTY YEARS!

We present the **Chambers Record** with the **Chambers Contract** for your consideration.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.

Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

See Pages 291.

STEEL CARS.

WE BUILD a full and complete line of **Steel Dryer** and **Dump Cars** and believing that the users of these goods are fully convinced, many of them by bitter experience, of the fallacy of using the cheap cars with which the market is flooded, we confine ourselves exclusively to the building of strictly high-grade cars, to stand the rough usage to which they are necessarily subjected. However, the equipment of our plant enables us to name extremely low prices upon Cars of any description and to make prompt delivery of any orders entrusted to our care. We respectfully solicit your inquiries.

CLEVELAND CAR CO.,

148-152 Scranton Ave., CLEVELAND, OHIO.

Mention the Clay-Worker

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WHEN WRITING TO ADVERTISERS

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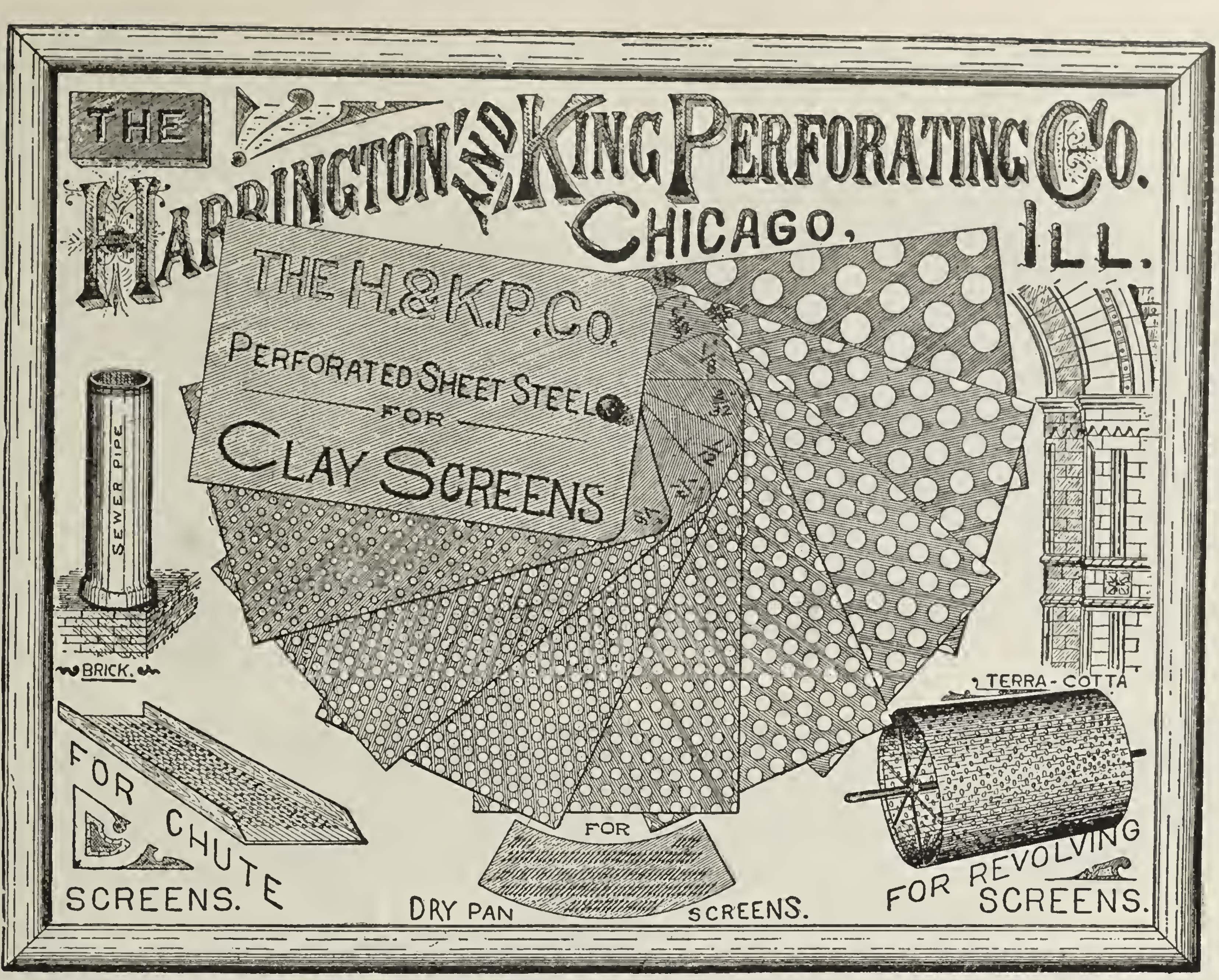
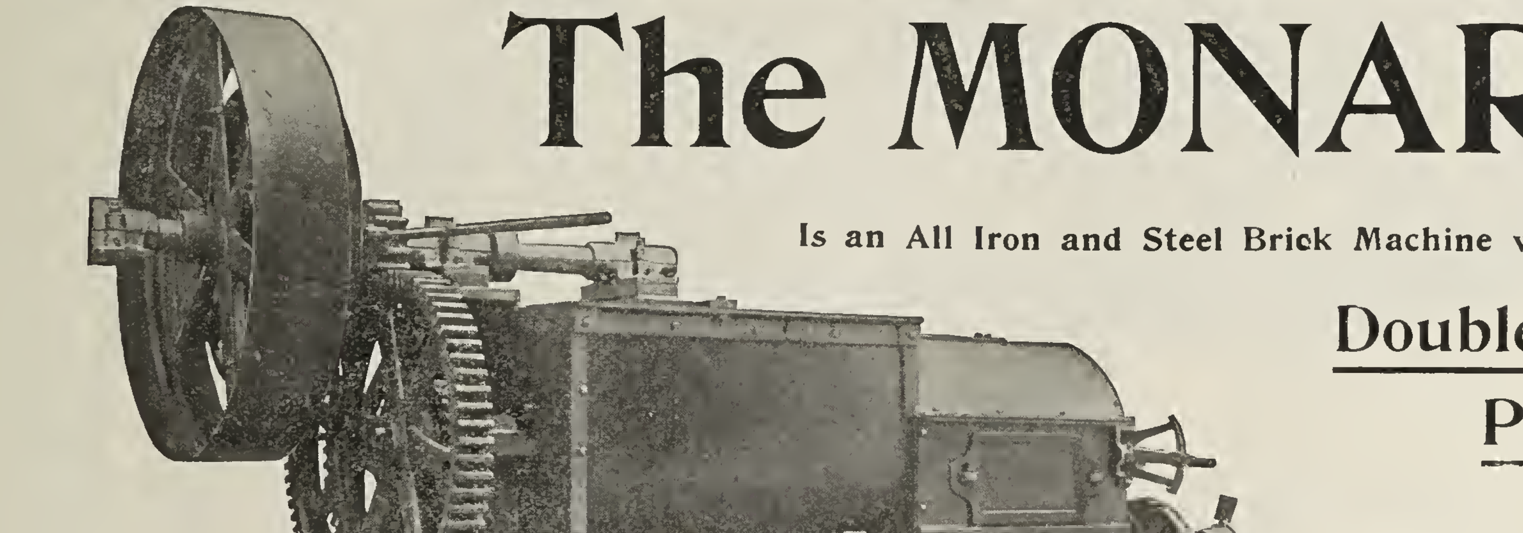

THE
HARRINGTON AND KING PERFORATING CO.
CHICAGO, ILL.
THE H.&K.P.Co.
PERFORATED SHEET STEEL FOR CLAY SCREENS
SEWER PIPE
BRICK.
TERRA-COTTA
FOR CHUTE SCREENS.
FOR DRY PAN SCREENS.
FOR REVOLVING SCREENS.

Eastern Office: No. 284 Pearl Street, NEW YORK. **General Office and Works:** No. 231 North Union St. CHICAGO, ILL., U. S. A.

The MONARCH



Is an All Iron and Steel Brick Machine with

Double——

Pug Mill.

• • •

SIMPLE
IN CON-
STRUCTION,
DURABLE
AND . . .
POWERFUL.

• • •

Every working part stands open to view both front and rear. It is a World' Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for 1898 Catalogue.

JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

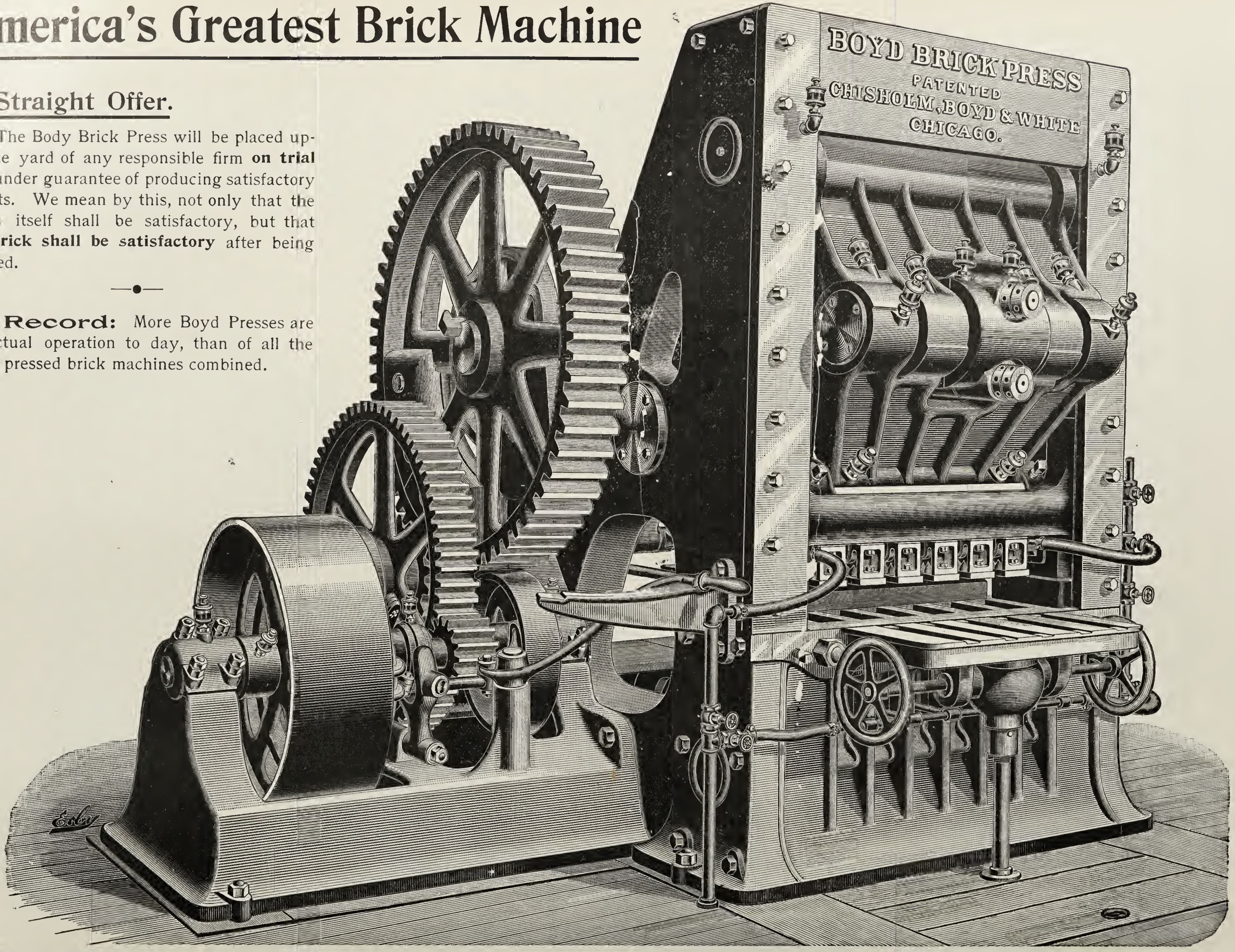
America's Greatest Brick Machine

A Straight Offer.

The Body Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

—●—

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,
57th and Wallace Streets.

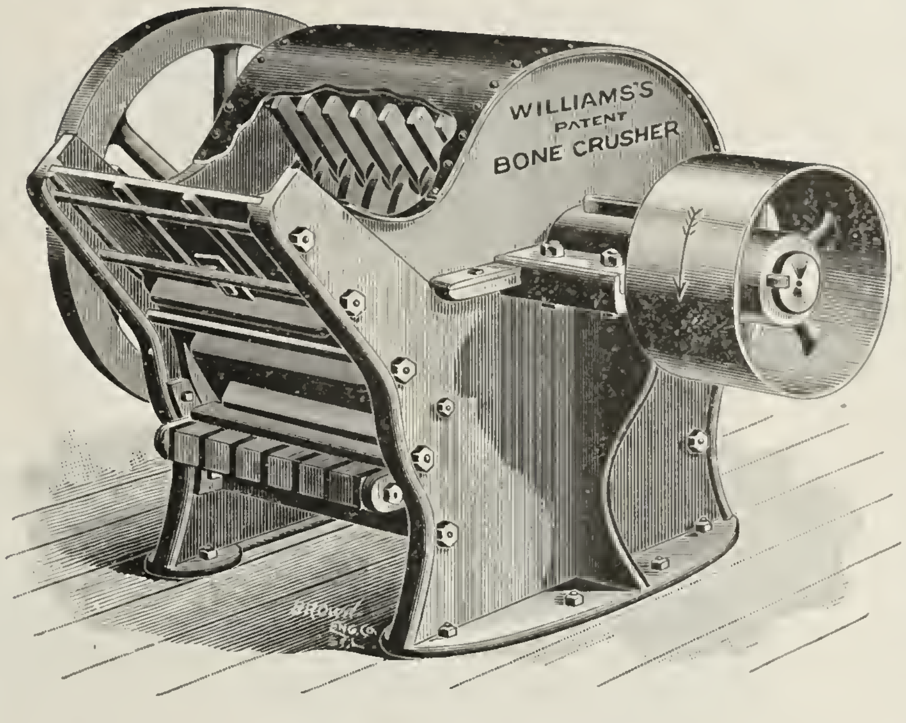
CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The Williams Patent Crusher & Pulverizer Company,

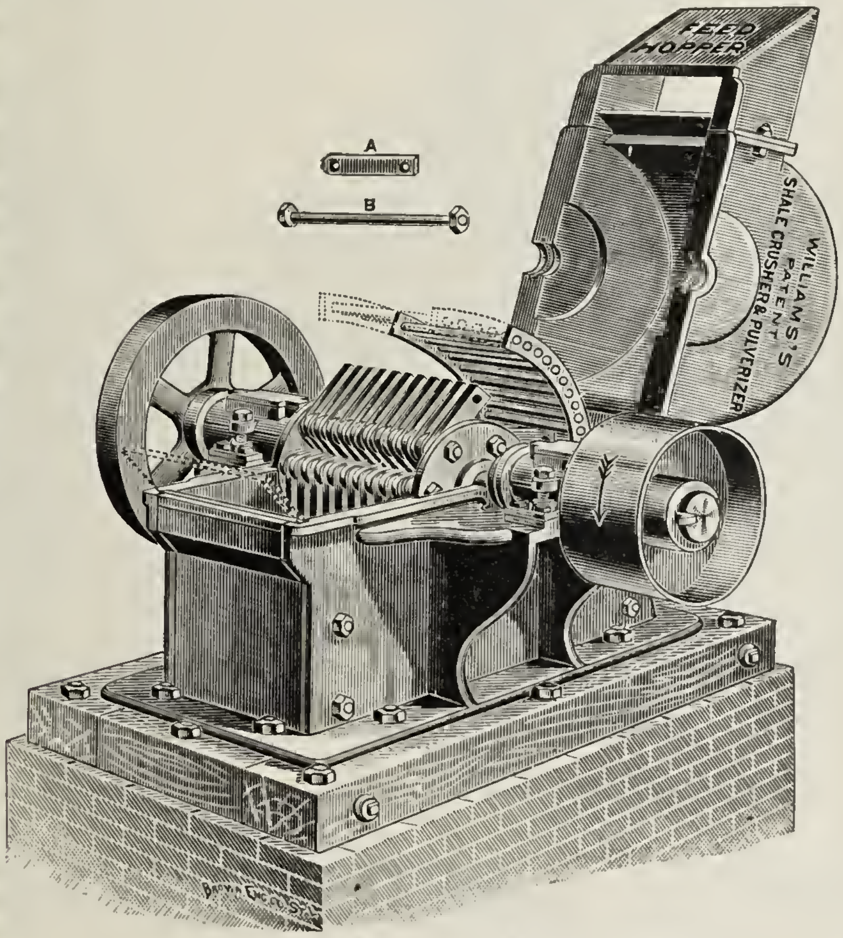
OF

ST. LOUIS, MO., U S. A.



Williams's Shale Breaker.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output. . . . .


FEED HOPPER
A
B
WILLIAMS'S PATENT SHALE CRUSHER & PULVERIZER

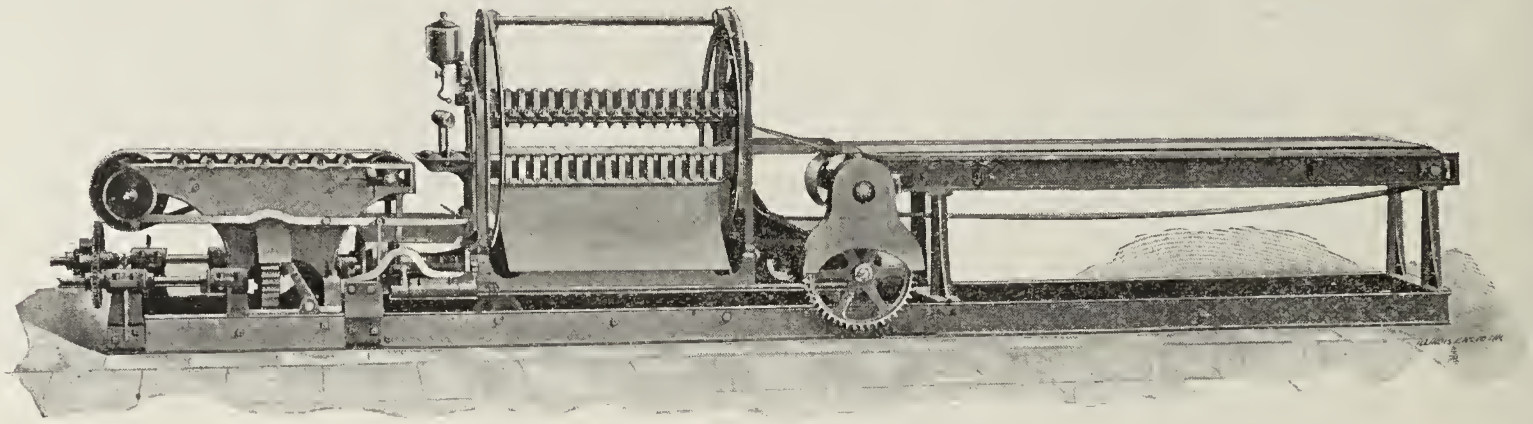
Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

FOR FURTHER INFORMATION
WRITE TO ✤✤✤✤✤✤✤✤✤✤

**The Williams
Patent
Crusher &
Pulverizer
Company,**

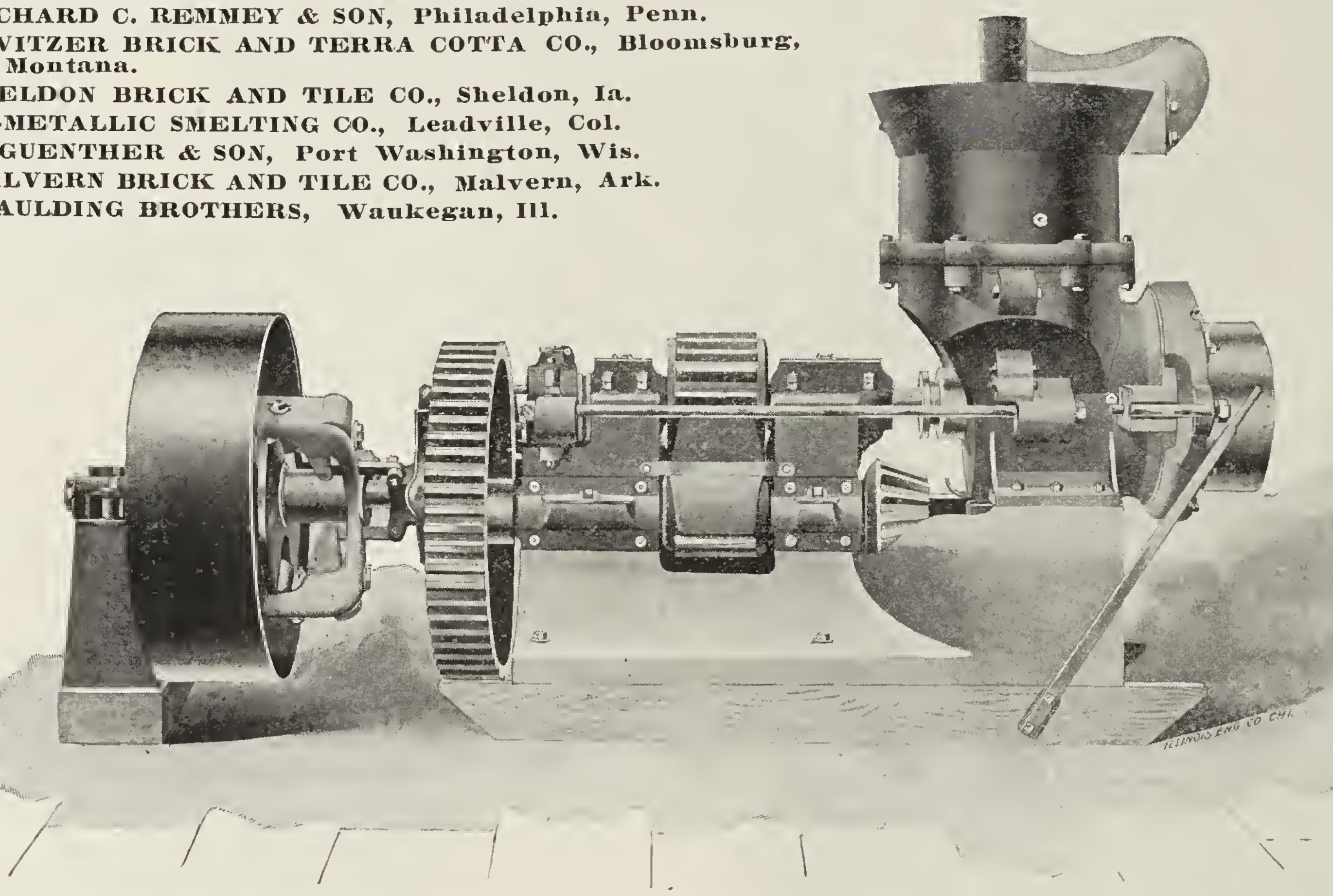
ST. LOUIS, MO.,
U. S. A.

The Wonder Clay-



Cunningham's Improved Combination End and Side Cut Automatic Brick Cutter.

NEWBERG PRESSED BRICK AND TERRA COTTA CO., Newberg, Ore.
GALESBURG PAVING BRICK CO., Galesburg, Ill.
HENRY C. ADAMS, Edge Water Park, N. J.
BOSTON FIRE PROOFING, CO., Boston, Mass.
LONG ISLAND BRICK CO., Greensport, L. I.
O'BRYAN & GREEN BRICK CO., Greenville, Ky.
WILLIAM TAYLOR & SON, Carleton Place, Ont.
DUVALL BRICK AND TILE CO., Duvall, O.
ELDORA BRICK AND TILE CO., Eldora, Ia.
N. Y. ARCHIT'CT'L TERRA COTTA CO., New York City.
JOHN M'FARLANE & SON, Lawrence, Kan.
RICHARD C. REMMEY & SON, Philadelphia, Penn.
SWITZER BRICK AND TERRA COTTA CO., Bloomsburg, Montana.
SHELDON BRICK AND TILE CO., Sheldon, Ia.
BI-METALLIC SMELTING CO., Leadville, Col.
G. GUENTHER & SON, Port Washington, Wis.
MALVERN BRICK AND TILE CO., Malvern, Ark.
SPAULDING BROTHERS, Waukegan, Ill.
GRAND RAPIDS BRICK CO, Grand Rapids, Mich.
VICTOR RANDALL, Sylvan, Portland, Ore.
W. G. WHEATCROFT, Grayville, Ill.
GRAND RAPIDS CONSOLIDATED BRICK AND TILE CO., Grand Rapids, Mich.
R. B. MOODY, De Land, Ill.
T. SAUSELEIN, Merchantsville, N. J.
MARTIN BRICK CO., Minneapolis, Minn.
JAMISON-FRENCH FIRE CLAY CO., St. Louis, Mo.
FRED H. VANDER HEYDEN, Ionia, Mich.
DENVER SEWER-PIPE AND CLAY CO., Denver, Col.



The Wonder Tile Machines, made in two sizes.

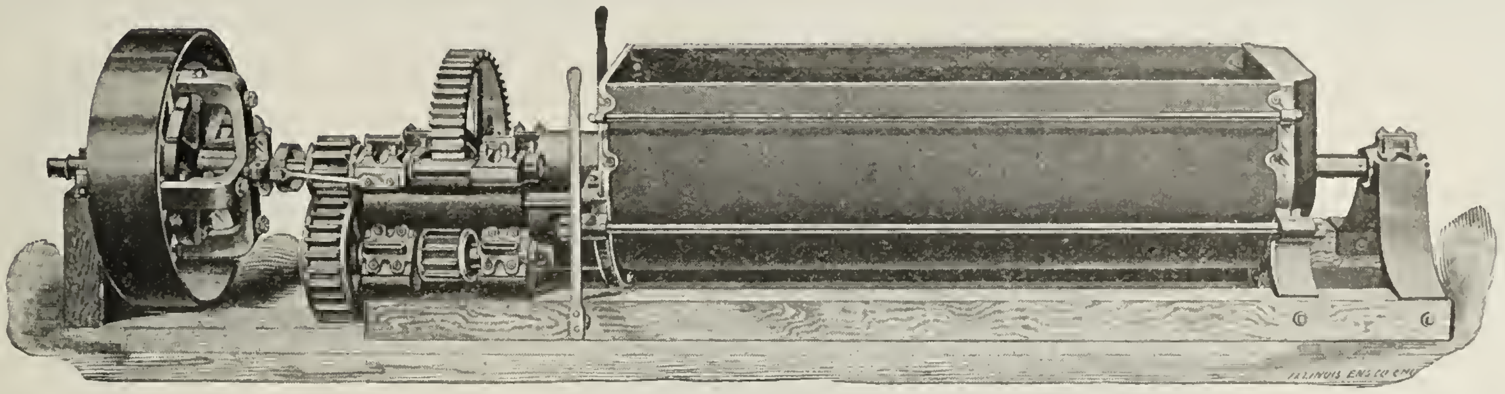
**We
Pleased
Them
Why
Not
You
As
Well.**

THE WALLACE

CHICAGO AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

Working Machinery

And a Few of its Friends.



Open Top Pug Mills of any size and capacity desired.

W. H. CARTER, Appleton, Wis.
HENRY KNEALE, Montmorenci, Ind.
W. H. LODGE, Monticello, Ill.
E. F. FOX, Sheffield, Ia.
DIXON-WOODS, Pittsburg, Penn.
FRED A. BEARD, Ruby, Mich.
M. C. MEIGS, Lafayette, Ind.
ZEELAND BRICK CO., Zeeland, Mich.
FRANK H. REID, Evanston, Cin., O.
D. AND W. ROLLER, Kingsport, Tenn.
LEXINGTON BRICK CO., Lexington, Ky.
PETER BITZER, Louisville, Ky.
W. H. STORMOUNT, Princeton, Ind.
COLLINS BRICK CO., Grand Rapids, Mich.
WINDFALL, M'F'G CO., Windfall, Ind.
FRED FLANDERS, Conover Station, Wis.
NEEDHAM BROS., Miami, Ind.
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CONKLIN-ARMSTRONG TERRA COTTA CO., Philadelphia, Penn.
TAYLOR BROS.' DON VALLEY BRICK WORKS, Toronto, Canada.
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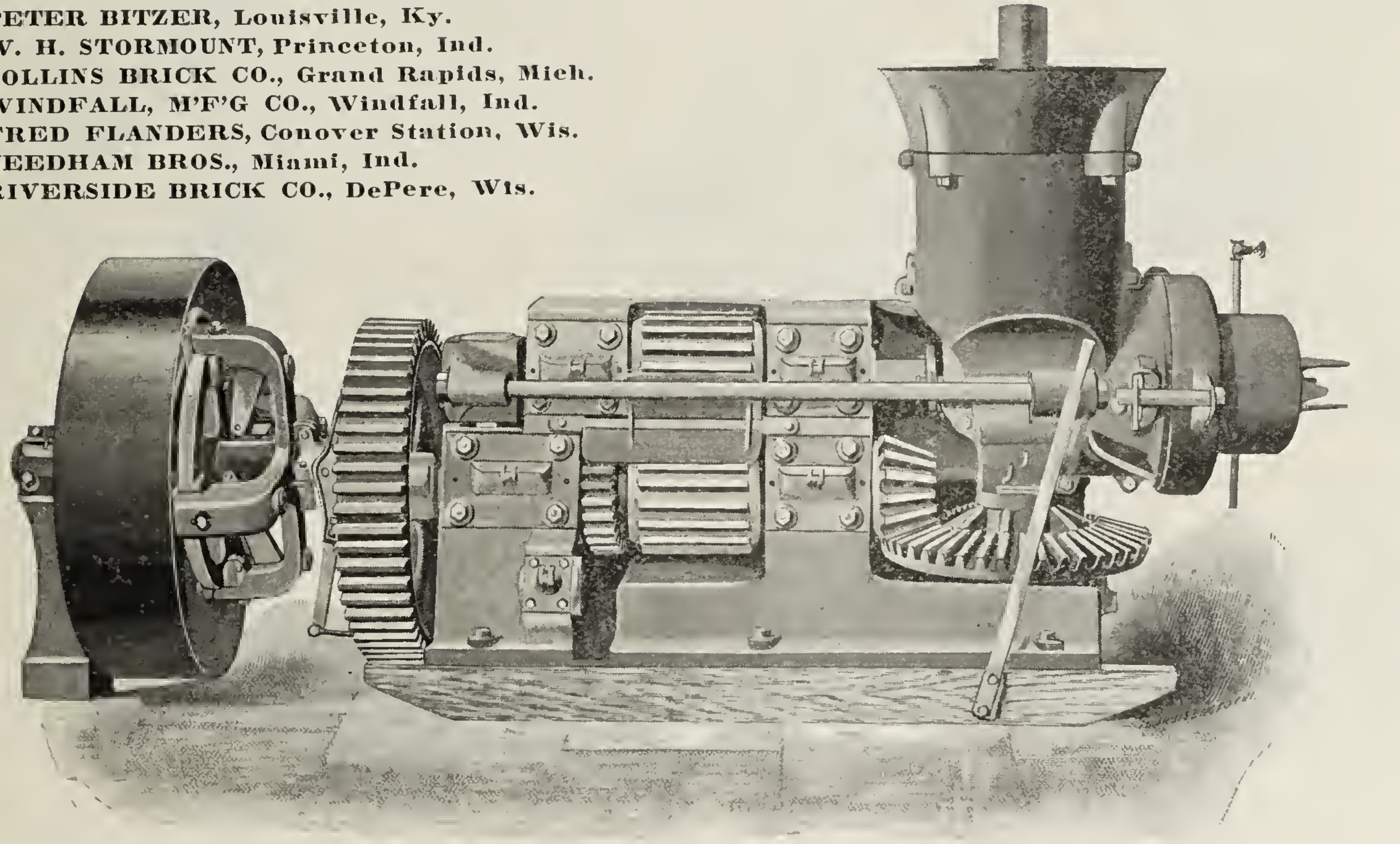
MONTREAL TERRA COTTA LUMBER CO., Montreal, Canada.
J. L. BURNHAM & SONS, Milwaukee, Wis.



If you Want the Best Brick and Tile Machinery, Don't Fail to get Our Prices.

Wonder Brick Machines, made in four sizes, with capacity ranging from 20,000 to 100,000 brick per day.

MANUFACTURING CO.,

Frankfort, Indiana.

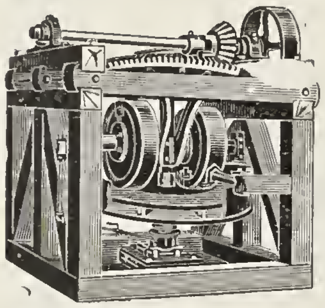
STEVENSON & CO., WELLSVILLE, OHIO, U. S. A.

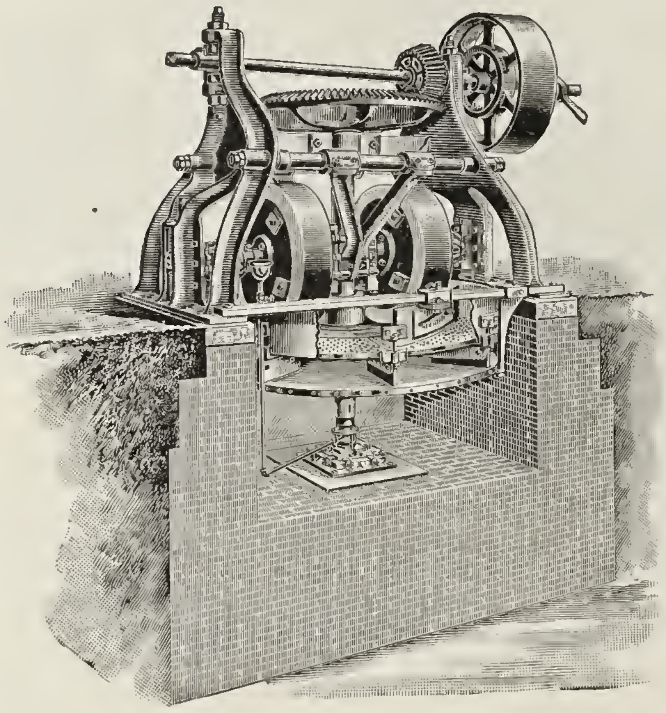
MANUFACTURERS OF

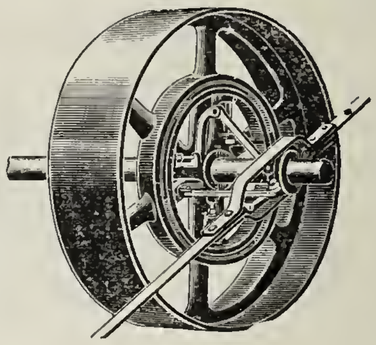
Brick Machinery.

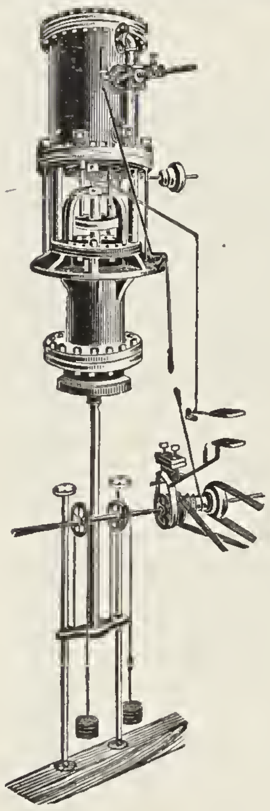
COMPLETE EQUIPMENTS.

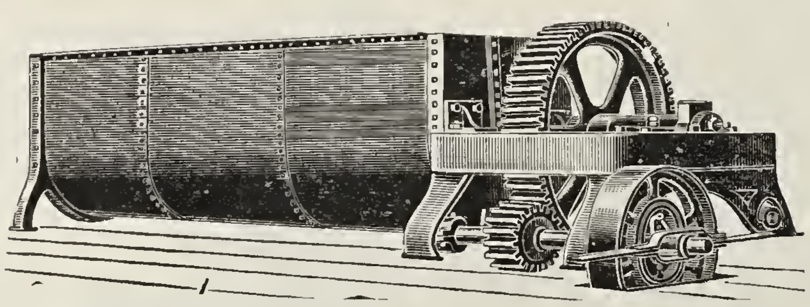
Tile Machinery

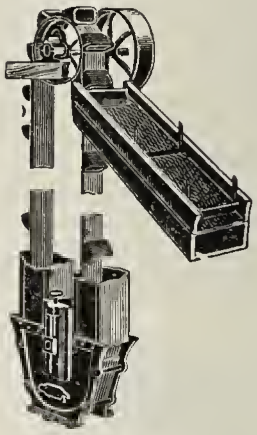












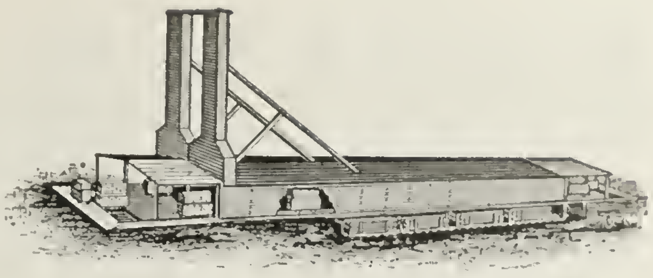
Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

National Bank

OR Coal Bank,



Chicago Iron Clad Dryer.

Is the Vital Question.

Chicago Brickmakers prefer depositing with the former. The accompanying letter from one of Chicago's leading brickmakers kindly offering the secret to all Brother Brickmakers seeking for light. A perusal of this letter will illuminate the fact that management and proper appliances determines which bank receives the deposit.

TELEPHONE MAIN 4132.

LABAHN BRICK CO.,
MANUFACTURERS OF
Building Brick.

YARD: Lansing, Ill., on Panhandle R. R.
Box 408, Builders' and Traders' Exchange.

OFFICE: 159 LaSalle Street, Room 97.

CHICAGO, February 1st, 1899.

MR. A. F. BARRON,
Successor to WOLFF DRYER Co., Chicago.

Dear Sir:—Your favor of January 30th, received. In replying to same, regret that I am unable to furnish you with the cost of fuel for drying our brick. Our steam power is so situated that we are unable to separate or divide it up so that the machinery and dryer could be run separately.

The best that I can do for you in this direction is to furnish the amount of steam power used to run our entire plant and fuel consumed for generating steam and burning brick.

The capacity of our plant averages one hundred and thirty-five thousand (135,000) per day in the years business.

The entire plant in run economically with three boilers, 125 horse power each. These boilers furnish the necessary steam required to run all machinery for making the brick, and likewise supplying the live steam which runs the dry house, drying our entire output, and all other purposes where steam is used about the premises. We are using Brazil block (soft coal) for generating steam, and this coal and wood for firing the kilns. The average cost per thousand for the entire product is seventy cents, for making, drying and burning. Our dry house has been in active service for the past six years. Since adding your improvements three years ago, in order to meet the increased capacity of our machinery, it has responded to all demands upon it Winter and Summer without diminution of capacity or perceptible difference in consumption of fuel. It is therefore needless to say that we are well pleased, and in fact should be more than satisfied, as the dryer turns out fifty per cent more brick than your contract specified.

Possibly these statistics may be of value to some brother brickmaker and yourself personally. We would therefore say to you that our plant and our books are open and free for inspection by all brickmakers seeking for light upon this important subject.

The foregoing is a just tribute to the merits of your Iron Clad Dry House and honorable methods of carrying out agreements. Our dry house is a four tunnel, sixteen track dryer, 112 feet long.

Yours very truly,
LABAHN BRICK CO.
John F. Labahn, President.

THE BARRON TENDER CLAY DRYER.

We build dryers to meet the peculiarities of the various clays. Innformation furnished.

A. F. BARRON,
Successor to WOLFF DRYER CO.,
Room 303, 358 Dearborn Street, CHICAGO, ILL.

UNBIASED TESTIMONY

IS THE KIND THAT COUNTS.

What a manufacturer says about his own product may sometimes be open to doubt. It would be a weak sort of man who didn't "stick up" for his own handiwork. But what **others** say—that's another story. We are willing that

The Standard Brick and Tile Drier

Should be judged by its record as made up by users. On this sort of testimony—the kind given below—"we rest our case."

Ensley Brick Co., Ensley, Ala.

Ensley, Ala., December 9, 1898.

The STANDARD DRY KILN CO.,
Indianapolis, Ind.

Gentlemen:—We are very much pleased with your Drier—it does even better than you guaranteed.

This is very gratifying to us as our first experience with Driers was very discouraging; in fact, a failure both as to drying and handling our material. The great mistake we made was in considering a proposition from and awarding the contract to a party who made us a lower price than yours, on our first Drier. In buying the second time we did not consider a bid from the first builder at all. Now we see the difference. There is no comparison between the two Driers, neither in equipment, workmanship or system.

Respectfully,
ENSLEY BRICK CO.,
H. L. Finkler, Sec'y.

Indianapolis, Ind., Nov. 3rd, 1898.

The STANDARD DRY KILN CO., Indianapolis, Ind.

Gentlemen:—The eleven track Steam Drier you put in for us at our Martinsville plant has been in use nearly one year, during which time it has been subjected to numerous and trying tests. Beginning as we did in the Winter with the clay wet and sloppy, and the shale full of frost, our soft mud brick entered the dry house cold and clammy. Under the scientific yet common sense method of distributing the heat and nature's own way of carrying off the moisture. our brick came from the Drier, sound and thoroughly dried and free from checks or fracture.

We dry our soft mud shale brick in 24 hours and our brick made from clay in 48 hours. The Drier is easily controlled, in fact it runs itself with no expense so far, for repairs or renewals; all that is required is steam sufficient to keep the temperature at 120 degrees at the receiving end, and about 165 degrees at the discharging end.

The cars we purchased of you with Cage Roller Bearings and well supported and braced steel racks, without doubt are far and away the best and most practical we have seen or tried. In fact the Drier with its outfit is to us an agreeable surprise, in the matter of durability, practical use and expense on account of repairs.

Yours very truly, *THE ADAMS BRICK CO.,*
J. C. Adams, Pres't.

The STANDARD Is the Drier that does not disappoint. It invariably does all and a little more than is claimed for it. It satisfies in every instance.

Our Catalogue and much more "Unbiased Testimony" can be had for the asking.

The Standard Dry Kiln Co.,

186 South Meridian Street. *INDIANAPOLIS, IND.*

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

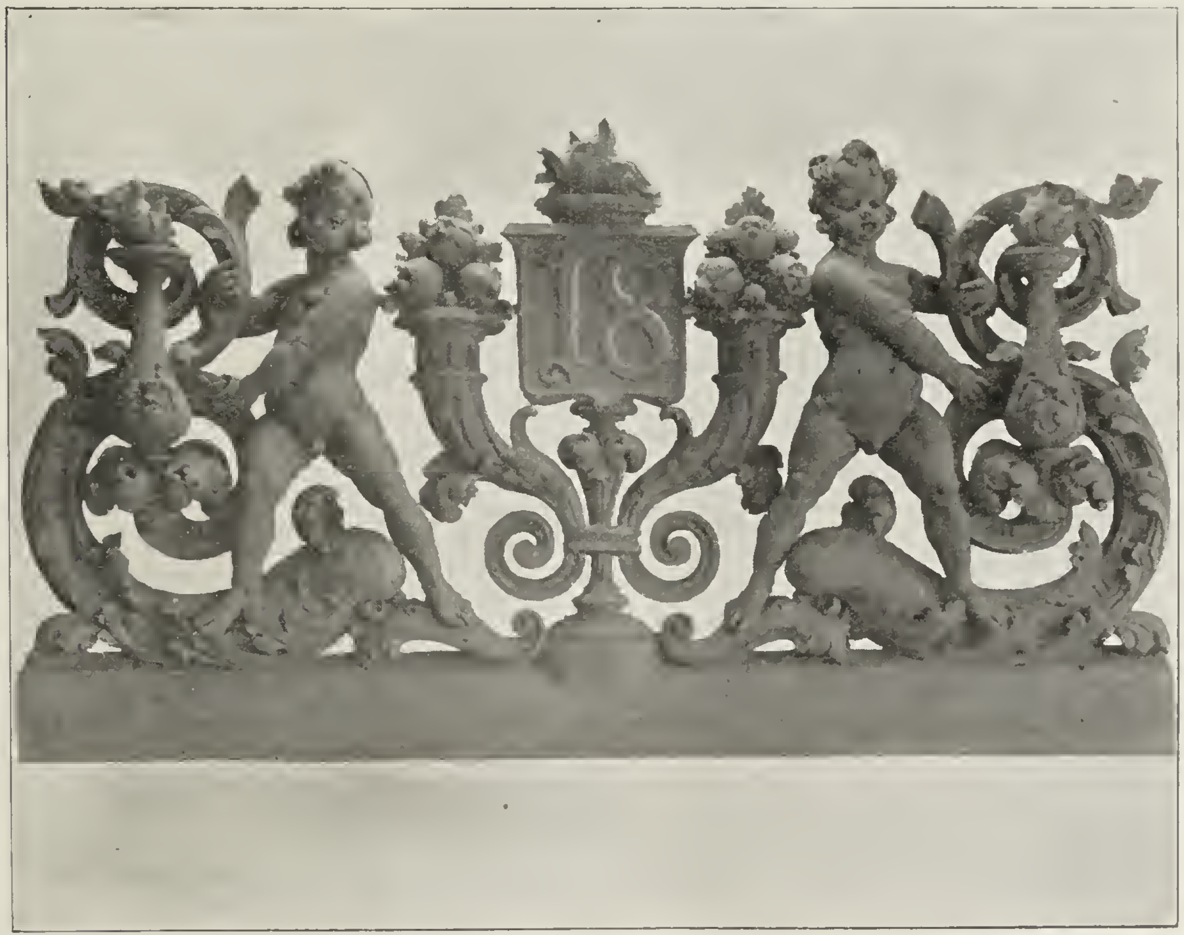
VOL. XXXI. INDIANAPOLIS, IND., MARCH, 1899. No. 3.

Written for the CLAY-WORKER.

TERRA COTTA AND BRICK.

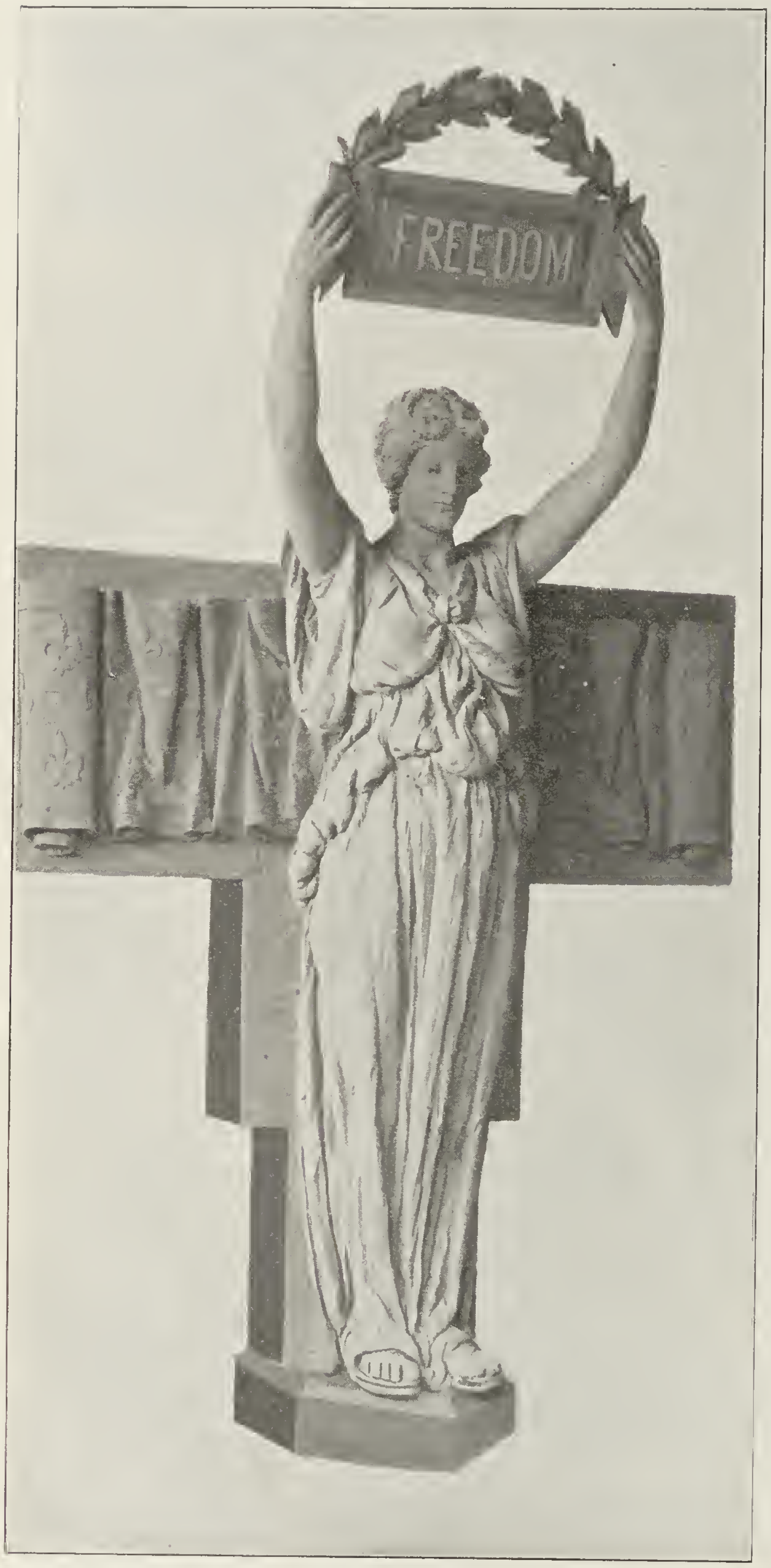
Far in the Lead in the race with Stone in Philadelphia.

WITHIN HEARING distance of Philadelphia's great City Hall there has lately emerged from the chaotic condition and skeleton state many stories (in height, please) of newly planned and well executed office buildings—sky scrapers veritably, which cast their deep shadows over what should be the judiciary seat of the city. Their completion, however, may be accepted as a signal evidence of the fulfillment of a prophecy made some four or five years ago that terra cotta in details and embellishments would prove the dominating factor in the race of stone versus terra cotta, with a plainly foregone conclusion that to-day stone is far behind the race. It must not be denied that stone has many qualities to recommend it. At the same time its qualifications are stilted by the argument of its non-adaptability to our inclement weather and its worse resisting qualities under fire and heat. Again, it is barred to all but the wealthy, since first-class stone cutters or masons are growing materially less each year, and, as a sequence, more exhorbitant in their wage demands. If therefore, preference be given to artistic effects, harmonizing in all the essential details, what can prove a better or more substantial material for this purpose than burned clays, with which the softer shades and colors can be so neutralized as to bring about a symphony in color? Who knows but what the spirit of the pre-Raphaelites may not yet descend to leave their finger marks upon the facades of public and commercial institutions? From the hideous Romanesque we have made rapid strides, and here, there and all over we find the Renaissance standing autocratically indifferent to the peculiar dressing of its more barbaric neighbors. Perhaps in time to come we shall find the east and west sides of the streets clad, like its residents, in a charming, symphonic attire, while the north and south sides will take on a warm and cold shade, relative to their respective spheres. This, then, will be the millennium of the clayworker—the idealistic chapter of the terra cotta man's life—the clay age. As an illustration, look at the Crozier or Baptist Publication Building, on the south side of Chestnut street, above Broad street. There we have the nice, clean, well tempered lines of the Renaissance period, dignified in its bearing, cheerful in aspect, and harmonious both in the senses of color and details, warm and sympathetic in subdued color that faces day and night the cold glare of the northern light. Figures as are here reproduced are at once an object lesson in the artistic possibilities of an exterior. Mark the very human result in the figure of Freedom, to be placed over the entrance of the Hartford Times Building in Connecticut. The critic would say that it is a very graceful figure, fleshy and full of feeling, a nice poise and very artistically draped. Then who would deny the beneficial effect of all this upon the rising generation?



ORNAMENTAL PANEL IN THE BAPTIST PUBLICATION BUILDING, PHILADELPHIA.
Executed by the Conkling-Armstrong Terra Cotta Co. F. M. Day, Architect.

A retrospective glance at many of our buildings erected forty or fifty years ago give back nothing that is responsive in magnetism or feeling. What impression does it make on you or I when we look upon the straight lines or clumsy curves, the unbending qualities of line after line of stone, pointed, and bearing a close relationship to the brick above, with no other relief than the low, pointed lines?



Heroic Figure for Times Building, Hartford, Conn. Designed by G. B. Rodgers, Architect. Executed by Conkling-Armstrong Co.

Nearly forty thousand dollars was expended in the terra cotta details for the Crozier Building, and within a stone's throw there emerges the head of the fourteen-story office building to be devoted to the use of the West End Trust Company, at Broad and South Penn square. This is another illustration in deep red of the congenial affinity of terra cotta and brick. String courses, lintels and crown moldings are here brought to bear the titles of relief, utterly ignoring stone either for strength or detail. The manufacture of this material, so soft and pliable in its formative state, and so strong and indestructible when burned, this vitrified medium, with good modeling and careful burning, stands midway between the plain but durable brick and fine art, is confined in this city almost entirely to the work of

—The Conkling-Armstrong Terra Cotta Company,—

Whose plant, at Wissahickon avenue and Juniata street, your correspondent had the pleasure of inspecting recently under the pilotage of their genial superintendent.

Covering some three or four acres, the layout may be said to consist of six up-draft Dutch kilns of eighteen and sixteen feet diameter, respectively, the first floor being devoted to the pressing and clayworking machinery, consisting of the usual pugging process. Ascending the second floor one is introduced to the misty, dusty atmosphere of the molding room, wherein the pressers are steadily working over forms of cornices, capitals, string courses, crown moldings, etc., that go to make up all the details essential to modern architectural ornamentation. Herein was being set out all the details for the Allegheny County Hospital, designed by Architect F. J. Osterling, of Pittsburg, Pa., and to be erected at Woodville, Pa. This institution, measuring 200 feet by 497 feet, calls for terra cotta trimmings that require the expenditure of thousands of dollars, as will also the Steritt subdistrict schoolhouse to be erected at Pittsburg from the plans of E. J. Carlisle & Co., architects of the same city. The third floor embraces much that belongs to the technical workings, such as the draughting room, where an able staff of draughtsmen are kept constantly employed in taking off the details, ranging from 1-32 and up, and draughting these into full-size details. To the layman this floor would prove the more interesting probably, since it is here that the modeler works directly from the drawings, and the process of "mud slinging" is gone into, the almost rude, shapeless mass being set up and quickly dominated by the well-trained eye, aided by the index finger and thumb, the scalpel playing but a minor part in the hands of an experienced workman. Knowledge of human and animal anatomy is required, and to the man possessing these essentials is given the difficult work of modeling such works of art as are illustrated in the CLAY-WORKER from time to time. Designs of floral and mural work also demand the greatest care. Fire shrinkage must be a nice point of calculation, and, when finished, the result must be a combination of good balance or poise, perfection in outline, color and texture—a product that is not only pleasing to the eye, but will stand proof against the ravages of the elements to the end of time. This firm, starting in 1894, consists of I. L. Conkling, Edward N. and Samuel B. Conkling and Thomas F. Armstrong, and employ a force of 130 hands, embracing pressers, plasterers, modelers, draughtsmen and other workmen, genial Thomas F. Armstrong being the aggressive and and energetic spirit that dominates the office in the Master Builders' Exchange.

PHILADELPHIA, March 1, 1899. W. P. LOCKINGTON.

From Far-Away South Africa.

Publishers Clay-Worker:

Yours of October 6 just to hand. Many thanks for the Clay-Worker, which I hope will reach me regularly now. I prize it very highly.

Business here just now, in all lines, as well as in the brick line, is very dull, but we hope for better times all around, and if Delagoa Bay should be opened soon for our enterprise, we will very soon have good times.

We have here everywhere splendid material on hand in the shape of common clay and fire clay. Messrs. Lewis & Mark, at Vereeniging, were very fortunate to find below their clay a wealth of coal, and have established collieries near their brick plant, for brick, fire clay and fire brick, muffles for assay furnaces, gas retorts, etc. I shall take pleasure in writing you again about the brick industry. W. W. G.

Johannesburg, S. A. R., Nov. 12, 1898.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK. No. 14.

WHOEVER HAS CAREFULLY considered the origin of clays, and the various stages of transportation and deposition through which they pass, is not surprised that they differ so greatly in their properties, but wonders why they are not more irregular. Let us realize that in the first place clays are the products of decomposition of many kinds of crystalline and sedimentary rocks, that this decomposition has some times been wholly, sometimes only partially completed; that, again, the weathered masses have been transported by various means and various forces, and finally were deposited in still water, or in streams of different localities. All these processes have been carried on more or less irregularly, and, as a result, a perfectly homogeneous product is out of the question. The most uniform material is obtained by decomposition in still water, sea or lake, or the pool of a river. The size and weight of the material transported varies with the velocity of the stream. Rapidly flowing rivers leave behind nothing but coarse gravel, while slowly moving streams deposit even the very finest mud. It is a well-known fact that the transporting power of a current of water varies as the sixth power of the velocity.

We all have our ideas of the uniformity, purity, color, plasticity, grain, etc., of a clay, and from our experience with one, two or several clays, we deduce certain conclusions in regard to its good or bad quality. But as our personal experience at the best is but limited, some of our conclusions are very apt to be erroneous. To build a manufacturing concern simply upon a foundation of purely empirical knowledge has cost, and will cost, large amounts of time and money, which could have been saved. Since every clay is different, and personal experience, even when combined with the ordinary burning tests, especially if the latter are made by interested parties, is very frequently but an unsafe guide, it is not unlikely that unexpected troubles are encountered, which postpone the paying stage of the business, sometimes to infinity. Far be it from the writer to belittle empirical knowledge, since all our knowledge is composed of experience and observed facts; in the case of empirical knowledge these facts are not numerous, nor in systematic sequence, and hence can give rise to no systematic reliable conclusions, while the so-called theoretical or scientific knowledge is a collection of related facts, gained by the experience of many men, and arranged into a system. Hence the somewhat antagonistic attitude of "practice" and "theory" is entirely out of place. Neither can do without the other. A man's individual observations, large and varied as they may be, should be supplemented by the collective experience.

Main Pediment Crozier Building, Philadelphia. F. M. Day, Architect. Executed by the Conkling-Armstrong Terra Cotta Co.

In dealing with a body so complex and subject to so many changes, a system of practical and scientific examination is of great importance. We should be able to determine whether a clay is fit to be used for a certain purpose, and how it must be treated in order to obtain best results, without going to the trouble of first putting up a more or less expensive plant. But how must we go to work in examining a clay in regard to its fitness? In considering clays we must first know their general characteristics and, second, we may determine the injurious and advantageous properties with respect to a certain purpose or the lessening of the detrimental property. The first part of the examination deals with the general investigation of the chemical and physical properties; this is done with the aid of chemical analysis, the determination of the character of the mineral ingredients and the behavior when exposed to the action of heat. The second part has to do with porosity, absorption, bonding power, plasticity, etc., and practical tests on a large scale. All the tests applied to a clay may be simply distinguished as chemical and physical. Thus we have under the head of chemical investigation of a raw material the following subjects:

Gross analysis,
Rational analysis.
Determination of soluble salts.

Under physical tests of the clay we must consider:

Structure,
Porosity,
Shrinkage,
Plasticity,

Bonding power,
Color,
Vitrification and melting point.

These must be followed by so-called practical tests on a larger scale, in which the material is prepared and molded by different machines and burned in regular kilns. The burnt clay, again, must be considered in respect to

Frost resistance,
Wearing power,
Hardness,
Density,
Crushing strength,
Cross-breaking strength.

This may seem a formidable array of tests, but the matter is not so complicated as it seems. Most of them may be carried on with comparatively simple means, and several of them may be omitted if the clay is intended for front brick. Such systematic investigations are not only valuable, individually considered, but they also give rise to important results when studied with respect to each other. But in thus studying clays by means of the experiment, a certain ability on the part of the operator is presupposed, the ability to perform the experimental work properly and to draw exact conclusions from it. Various conditions must be considered, precautions taken, and the data accurately observed, as we will try to show under the various tests. Poor work, slovenly done and unreasonably considered, cannot be expected to be of any value. Not every man has the faculty of conducting experimental research or drawing conclusions from it. Many cannot get time to do it. But who, if the benefits of systematic investigation are to be realized, shall undertake such work? Happy is the clayworker who can conduct the experiments himself, for he thus makes the acquaintance of his material in the best possible manner; he learns its defects and how to eliminate them and its possibilities. But every clayworker should make the most important physical tests himself. The chemical and part of the physical determinations should be made by an expert. Now there are experts and experts, men who have made the study of clays their life-work; have had practical experience, and have facilities for experimental research, and also such who are nothing but charlatans, even if they do come from Europe. But it is not difficult to tell the right man from the quack.

The value of experimental investigation is often doubted; frequently the writer has heard it condemned by practical men, who had forgotten the loss of time and money they suffered when starting new works, which, in several cases, was not inconsiderable, and who never had a proper idea of what systematic testing really means. Such judgment is evidently unfair. The writer has seen more than one clayworking concern, which, if their material had been properly tested before building, either would never have been built, or, at least, greatly modified. Again, we have in mind at least three distinct cases, in which the manufacture of high-class clay ware was entered upon by concerns having at their head men with sound scientific training. Now in all three cases there was almost no American precedent to go by, the ware, as well as the equipment, being original in design. Those men, before entering upon the new enterprises, made thorough experiments along the lines to be followed, and even now keep them up in order to be able to improve the quality as well as reduce the cost of the output.

Now, it is not necessary for a front-brick manufacturer to keep on experimenting indefinitely, nor to spend considerable amounts of money for this purpose, but let him do the experimental work before the factory is built. There is a possibility of an excess in this line, since there are men who are possessed by the experimental mania, and who never know when to stop. To keep on changing methods of manufacture based upon hastily made conclusions is not experimenting in the true sense of the word. Experimenting should stop when it has been demonstrated that a clay is fit for a certain purpose, using a certain process. Of course if, when manufacturing has begun, the ware is not what it ought to be, judicious trials should be made with an object to improving the quality. Likewise, in certain lines, as in the manufacture of glazed and enameled brick, regular experimental work on a small scale should be carried on in order to keep up a high standard of ware and also in order to test the raw material and glaze ingredients, so that no serious errors can be made on a large scale.

A front-brick maker should not only know the extent of his clay land and the available depth of clay, but he should also test the material obtained by digging or drilling, so as to become familiar with the peculiarities of each vein, its color, its liability to crack, its pyrometric value, etc. A careful record should be kept of the different deposits; their extent, dip, whether containing impurities, and other data should be known, so that the best method of attacking and working the bank can be carefully considered. Knowing these facts, the proper selection or mixture of the clays is not a difficult matter. At this stage the making of the clay into ware by different machines is in order, and in this respect no difficulty will be experienced as every manufacturer of clayworking machinery will be glad to co-operate with the clayworker. and, perhaps, the assistance of a fellow craftsman can be secured. The burning of the full size ware must be accomplished in regular kilns at a friendly clay works or in a kiln built at the site of the prospective plant, for by this time the preliminary experiments must have shown whether or not the clay is of the proper quality.

The question of the cost of such testing, as has been crudely outlined, is not an important one, since the expenditure of a hundred or two hundred dollars in this way might result in the saving of many times those amounts.

In using the hypothetical case of a manufacturer starting in a new field the writer does, of course, not mean to indicate that the subject is devoid of interest for the established members of the craft, nor is it his intention to discuss it solely for beginners in the art of clayworking.

In the next papers we shall consider the testing of clays, both chemically and physically, and take up the points as given in our outline. AMERICUS.

[To be continued.]

Wonderful Stage Effects.

—The Porcelain Ballet.—

A sensation came to London this week in the pantomime, "The Forty Thieves." The scene at the Drury Lane was a wide, high vaulting hall of crystal, as white as a glacier and as lustrous as stars. The pen cannot tell the public of the marvel of that vision.

And it was planned and produced by a man named Smith! The poetic imagination of Smith conceived the long vanishing perspectives of jeweled light, the broad gleaming glass staircase that descends precipitously down the center and over which falls a sparkling current of real water lighted from beneath by emeralds and rubies and all the gems of the earth. That scene in its white glory represented the chastity of art and was as unutterably beautiful as the nave of a cathedral or as moonlight on the sea. It was instantly agreed by the audience, and the verdict will prevail, that nothing so triumphantly effective has ever been seen in the theater since the theater was an institution.

But if the scene by itself was amazing, what did it become when Drury Lane's female army poured down the starry stairways and marched and countermarched to the crash of the brasses and drums? Bear in mind that Smith still prevailed. The costumery, of a more artistic nature than was ever before revealed in a spectacular show, was his suggestion. The totality went by the name of "The Porcelain Ballet." To say that the girls represented the ceramic art of the world, each being an exquisitely decorated porcelain vase, would give no idea whatever of the peculiarly rich, almost sublime, effect that was gained. It must be understood that the porcelain costumes went beyond the limit of imitation and were as real as reality. Here were Sevres, Satsuma, Worcester, Dresden and all the noteworthy wares treasured by collectors, expressed with a delicacy that is indescribable. Each style was expressed by groups of fourteen girls, and when all had assembled upon the crystal scene the mammoth stage presented a spectacle of beauty that almost hurt you, it was such a paradise of color and luminosity.—London Cable New York Morning Telegraph.

Written for the CLAY-WORKER.

A BRICK FACTORY IN A WOODEN TOWN. No. 10.

(L. C. M.)

THERE IS AN OLD adage that experience is a costly school, but a good one. The first clause of that old saw is perfectly true. Experience is a *costly* school. So many of us have come so nearly spending our all—not only our money, but our strength and the best years of our life as well—in this costly school that it is most discouraging when we figure out what we have spent there. But is it a *good* school? Would you send your boy there and sleep well at night yourself, feeling sure that he would get the full value of his money—or rather your money? You have been there yourself, and know only too well what poor teachers are there and how few are the scientific helps for the blundering student. And though you may have pulled through with some few honors, you know how many others there were of your class who have made such failures that you cannot help feeling a little bit shaky when your own son starts upon the same old course. To be sure, he starts like the rest, young, strong and brave, with all the hopes and assurance of youth, but years of toil and, perhaps, failure will change the aspect of all things, and ere the death angel grants his diploma he may begin to doubt if he went to the right school.

When the poor brickmaker looks back over his scholastic experience in this dread school what visions meet his retrospective view. There are empty soak-pits and broken sweeps; and the bones of the old gray horse that went the rounds with his daily grind now lie bleaching in an abandoned clay mine. There are great heaps of rubbish where once stood the old scove kiln, and weeds and grass overgrow the yard where once were nice even rows of bricks laid out to dry in the sun—or rather, perhaps, to catch the next heavy rain, and have to be carted back to the same old soak-pit and furnish the old gray horse another day's grind. The school of experience condemned all these things as "old fogy," and they must be cast aside for something up to date. In one far corner of the grounds, in the same pile with the old one-"hoss" cart, lies something that was called a brick machine in years gone by. It has some levers and cranks and out-of-date appliances, but it was purchased on a guarantee to do as much work as three men and two boys. But there it lies, condemned by the whole class in the school of experience, though at one time it was brought into the yard as the greatest boon to the toiling brickmakers, and a sure gold mine to its fortunate purchaser. And what heaps of old lumber from those cheap, tumble-down sheds, which the boys have piled and repiled, in regular boy fashion, in their eager search for rats, skunks and rabbits. And that pond dam, too, and that old macadamized road are full of interest (and principal, too), for they are made of the scraps that failed to be loaded in the customers' wagons. But what are these queer shaped scraps of burned clay that form part of this old road. "Oh, I tried my hand at making roofing tiles, and those scraps tell the tale of my success. There are more of them over there in that dam. That old contrivance there by that crumbling kiln wall is the remains of the machine I invented to make them with. It was a great scheme, but it would not work. And that old kiln you see there is all that is left of my invention to revolutionize brick burning. Many of these hairs you see in my head turned from red to gray while I planned, built and filled that kiln and attempted to burn it. And that other pile over there are the ornamental bricks that somehow never would sell. Over on the other side of this dryer that cracks my bricks all to pieces lies the pile of old dies and various other parts of discarded machinery, all of which I shall cart off to the foundry as soon as I get time."

"My friend, you surely have done a great deal of experimenting in your line of work. Don't you think you would do well to give up your attmepts to learn new methods, and settle down to making good, honest common bricks, and let some other man try his hand at experiments? A man learns a great deal in the school of experience, but it seems to me that you are paying to high for your tuition. You have made many millions of good bricks, and sold them at good, old-fashioned prices, but your profits are all in these heaps of rubbish, over which one stumbles at every corner of your yard."

"Yes," he said, sadly, "and their is one incumbrance you cannot see, but the weight of which I can feel with crushing effect. That is the mortgage on the whole place and on my residence, too. I had to put it there to raise money to purchase that last installment of modern machinery that is warranted to pull me out of the ruts."

But, be the school of experience a good or a poor one, it is all the majority of us had to attend. There were no text-books, no brickmakers' conventions, no CLAY-WORKER nor school of ceramics. It seems that a brighter day for the toiler in clay is dawning; and even now we feel the warmth and are gladdened by the light of scientific principles and methods applied to clayworking. Experimenting in clay will always be in order, for ours is a broad and deep subject to attempt to master. The most learned in our craft are only beginners—novices in the scientific principles of ceramics.

But the work is being pushed along all lines as rapidly as its great commercial, scientific and artistic importance demands. And soon even the small factory will give employment to experts trained in our schools for clayworkers.

(To Be Continued.)

When to Stop Advertising.

An English journal requested a number of its largest advertisers to give their opinions concerning the best time to stop advertising, and the following replies were received:

When the population ceases to multiply and the generations that crowd on after you and never heard of you, stop coming on.

When you have convinced everybody whose life will touch yours that you have better goods and lower prices than they can get anywhere else.

When you perceive it to be the rule that men who never advertise are outstripping their neighbors in the same line of business.

When men stop making fortunes right in your sight solely through the direct use of the mighty agent.

When you can forget the words of the shrewdest and most successful men concerning the main cause of their prosperity.

When every man has become so thoroughly a creature of habit that he will certainly buy this year where he bought last year.

When younger and fresher houses in your line cease starting up and using the trade journals in telling the people how much better they can do for them than you can.

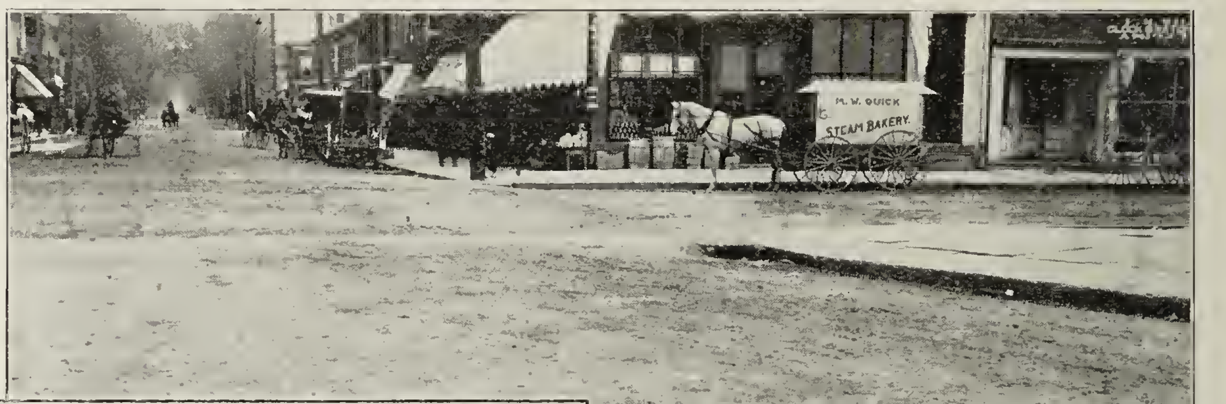
When you would rather have your own way and fail than take advice and win.

When nobody else thinks it pays to advertise.

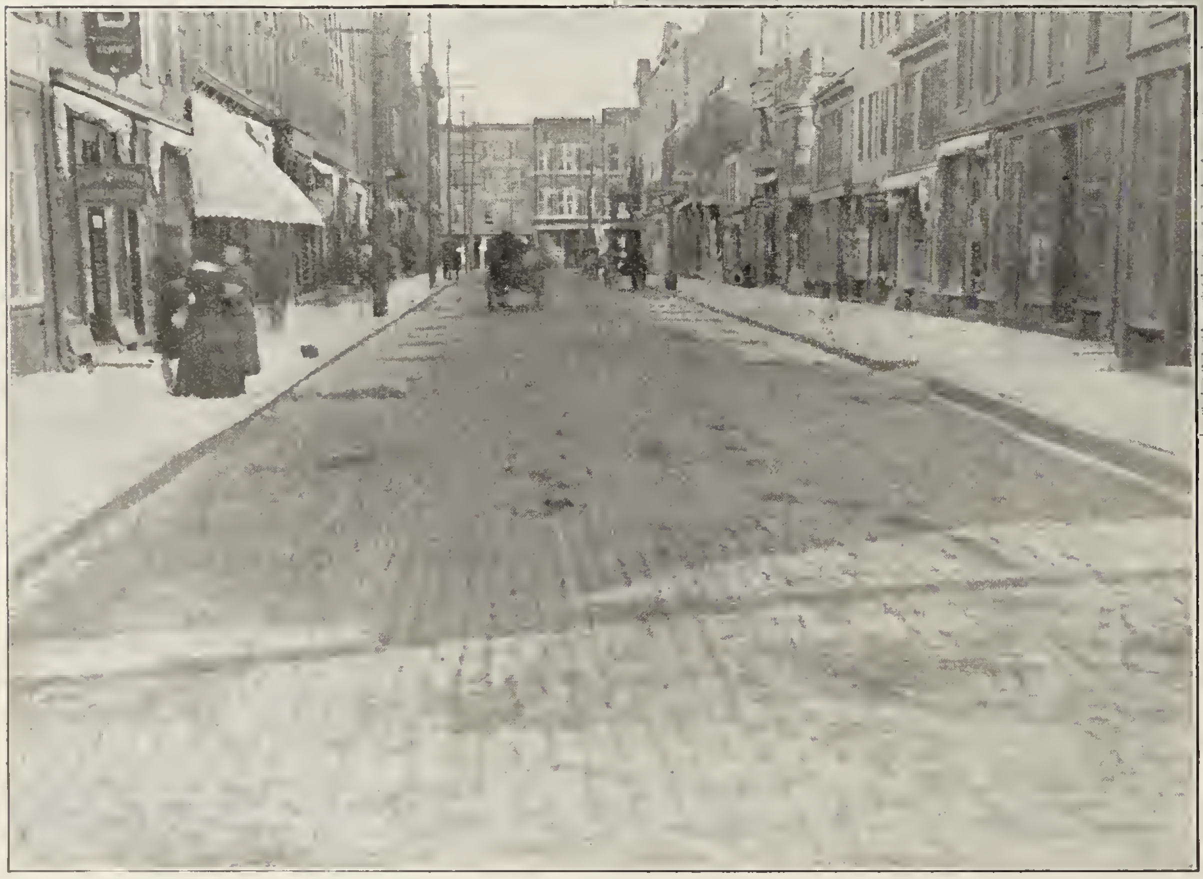
Written for the **CLAY-WORKER.**

SOME BRICK PAVEMENTS IN WESTERN NEW YORK.

YOUR VERY KIND invitation to break my silence upon the subject of brick pavements, Mr. Editor, shall not be ignored. My short and crowded life as a brickmaker is one that I look back upon with much pleasure, when contemplating the class of men I met as brother brickmakers. Surely for that good comradry at conventions and that broad friendship throughout the year with my competitors, in memory, is a mine of pleasing recollections. Some half dozen or so of the members of the N. B. M. A. should have it fittingly inscribed on the marble o'er them that they loved their fellow men. In the current number of the CLAY-WORKER I am surprised to see that, as photographed in Peoria for the Illinois State Convention, my friend Purington has grown rapidly younger. At first blush I thought the trend toward juvenility was brought about by his parting his hair—a distinct innovation, is it not? But then my hair is broadly parted all the time, and the boys don't expect me to play marbles. The brick pavements of western New York date back, generally, about six years. The climate is not particularly favorable to the long life of any brick—human, vitrified or common. The ground freezes to a considerable extent each winter. The rainfall is quite large in this "Lake county," and the summers are hot. The weather is most changeable and erratic. Some medical men fear that in the eons to come, beyond the lifetime of we bricks, this region will become depopulated. This will be caused by a form of influenza induced by damp and sudden weather changes. Macadam has been largely used as a paving material in all towns. It is so used still, when not supplemented by other materials, for the limestone rocks found here (Trenton and others) are excellent for macadam purposes. To-day, on country roads, large quantities of macadam are used. Townships own crushers, steam rollers and road grading machines. Farmers often work out their road taxes by hauling to a place assigned by the highway commissioner of the township the stones once used in stonewall fences on the farm. The frost heaves this ground and destroys a stonewall as a fence in about thirty years. Then, too, fences are needed less than formerly. These stones from the walls are the field stones, picked up to facilitate cultivation of the ground. They are limestone, in the main, but with some sandstone and considerable quantities of glacial drift granite boulders (here called hard heads.) There is enough lime to bind the whole under a roller and a wetting. The chips and sand make an admirable top dressing and binder. This process is giving in many country districts admirable roads. The stone road is narrow—one track. Often a dirt track for summer is carefully prepared alongside. Gravel abounds here, but little is used as a binder, the tailings from the crusher being preferred.



South Aurora Street, Ithaca, New York.
Paved in 1892.



Lake Street, Owego, N. Y. Paved in 1892.

But how does this macadam on country roads bear upon the question of brick pavements, you may ask. It has a most important bearing. It is making the cities and villages use something better than macadam. Good road is a relative term, given miles of good (though narrow) macadam road leading to a village, and who would be satisfied with macadam village streets? Were there good macadam roads throughout Illinois there would be a livelier demand for brick pavements there Make macadam cheap enough for country roads, and the streets must have brick or something as good. Not only that, but the tendency would exist on heavy traffic country roads near cities to use something better than macadam.

The earliest pavement here, passing over cobble stones covered with gravel, was a wood pavement. At first square blocks of pine were used, but later round blocks of pine or cedar were employed. Now, wooden block do not "float" here as in Chicago. The Susquehanna river and its tributaries have a monopoly in the floating line. It is said that things generally move more in Chicago than in the Empire State. However, this region goes up each fall and comes down each spring. Its motion is annual, and to be counted upon. It is less erratic than the city on floating foundations. The frost, but more especially the rains and sun in rapid alternations, decays wood block pavements here, so that it becomes insufferably rough. It is smooth but a few years, and must be renewed so often that it is for a term of years very costly. Cities like Elmira and Binghamton next used asphalt. Smaller cities like Ithaca could not get asphalt, and the asphalt companies plainly told that city that asphalt was entirely out of the question. Last year the asphalt companies used, as at Cortland, a factory on cars. This probably marks a departure here. It would appear that brick competition led them to this step. Where asphalt has been used no new features develop except that, from observation, it seems to deteriorate more rapidly than in Illinois. The second year it must be patched a good deal, and still more the succeeding year. Asphalt was here first, as compared with brick, and it is here to fight. Horsemen dislike it in this frosty, rainy region, for many horses fall. Cyclists criticise it in the hottest weather, for it marks and holds. It is dusty in the spring and fall. This is a windy region in this niche of the Appalachian range. No asphalt paving has been put down in Binghamton this year, but brick has been put down extensively. The oldest brick pavement in Binghamton was laid in 1891. It is on Commercial street—really a wide alley in the wholesale district. It was laid and paid for by the owners of the abutting property. It is a heavy teaming street. It was put down on concrete, and has never been repaired. It is now in fine condition. The next oldest pavement in the city is on State street, from Henry to Lewis street, a considerable distance. This is Hornellsville, N. Y., brick (Preston Brick Co.), put down on six inches of concrete, with a one-inch cushion of sand. The concrete was made up of five parts of broken stone, two parts of sand and one part of National cement from Howe's Cave. The contract price was $2.60 per square yard. This pavement is, for its entire length, on a filled-in canal. The filling had not entirely settled when the pavement was laid. The ground was rolled, but not enough time could be given to the rolling. Hollows, exist, as shown in the photograph. They are quite small, and not sufficient to make the street objectionable for driving or trucking. It is conceded there that these depressions are from the settling of the foundation. The paving on that street is considered, under the circumstances, satisfactory. The information concerning the brick pavements of the fine city of Binghamton was obtained through the courtesy of Mr. S. E. Monroe, city engineer. The public sentiment of the city is now in favor of brick. The interest is very great on the subject of paving, and great care is being taken in the work. In fairness to all manufacturers, it should be said that in later years brick have also been furnished by the New York Paving Brick Co., of Syracuse. This fall the Mack wire-cut brick of Chambersburg, W. Va., were used.

State Street, Binghamton, New York.
Paved in 1892.

Commercial Street, Binghamton, N. Y. Paved in 1891.

At Owego the cut shows Lake street, a winter picture, but a fairly clean pavement. The ice is to be seen in the gutters. These are Mack Co. brick, put down in 1893, and are still in good condition, and no steam roller was used. Six inches of concrete was put down, and a sand cushion. Poor sand and poor cement were used. In excavating recently the concrete was found to have hardened not at all. It is contemplated taking up the brick, reversing them and putting them down on good concrete. No fault is found with the brick, and the pavement is good now.

At Ithaca is shown the trial brick pavement, which was the pioneer of all the rest. The pavement was laid in 1892, of "John Porter" brick, on six inches of good concrete. The street is in first-class condition in every way. Much later brick pavement has been constructed there. Some Ohio brick were used two years ago. This year a local brick is being put in. No fillers are used generally in these three towns, but a filler was used in Binghamton this year. It is not thought necessary or a wise expenditure. Two courses of brick are not used. Most of the streets have seen heavy traffic, and concrete rock and sand are at hand at reasonable prices. There are some good local cements in this region. Concrete tends to be cheap. This condition militates against the bottom course of brick. Prices for paving do not rule as low as in the West, for freight rates here are not as flexible; or, perhaps, brick men here are less insistent upon sharing railroad profits. You know we Western brickmakers used to be willing to divide anything—of the other fellow's. Brick pavements are here in western New York, are growing in favor and have come to stay.

Willard Beahan.

The business men with most "push" generally have the greatest "pull."

Written for The Clay-Worker.

BRICK VS. ASPHALT.

Do Paving Brick Receive Fair Treatment from Engineers?—A Case in Point.

A FORCE OF MEN is to-day engaged in cleaning Lafayette street. In removing the accumulated dirt from the surface many defects in the asphalt were discovered. In many places there are holes nearly a foot long and about a foot wide. There are a great many of such between Jefferson and Washington streets. A good deal of repairing will have to be done by the Alcatraz Co."

The above is a clipping from the South Bend Daily Times, Jan. 3. Immediately adjoining the asphalt pavement above referred to is the first block of brick pavement laid in this city. The brick pavement has been in use *over ten years;* has not had a cent of repairs in that time; is now in good repair, and from present appearances is good for twenty years more. The asphalt has not been used *ten weeks*, but, as the clipping shows, is already in need of repairs, and the probability seems to be that, like Washington street, in Indianapolis, it will require almost constant attention from the repair gang during the entire existence of the pavement.

The question has recently been asked by one of The Clay-Worker's contributors, "Do paving brick receive fair treatment from engineers?" and the facts in regard to this Lafayette street job have a direct bearing on that question. Property owners along the street were divided in sentiment, some favoring brick, while some wanted asphalt. The Common Council directed that proposals for both kinds of pavements be solicited. In preparing specifications for the two kinds of pavement is when the engineer favored the asphalt interests. He made the terms in regard to bonds, guarantee of payment and terms of payments for the work so different from the ordinary specifications for brick pavements, that contractors, in order to make themselves safe, had to bid from 30 to 40 per cent. higher than first-class brick pavements have cost both before and since that Lafayette street job was let. On the other hand, the requirements for the asphalt pavement were for the minimum thickness of asphalt. When the proposals were opened the bids on brick pavements were, and necessarily, too, from 30 to 50 per cent. higher than has ever been paid in this city for first-class brick pavements, either before or since, while the bids for asphalt were correspondingly low, showing only a few cents per square yard in favor of the brick, and, as the Council desired to try the asphalt, the contract was so awarded. Had their been no unusual requirements in the specifications for brick pavements, and had a strictly first-class asphalt pavement been required, there would probably have been a much greater difference in the bids on the two kinds of pavements, and it is not unlikely that brick would have won, instead of the asphalt.

It is absolutely certain that brick did not receive "fair treatment" in this case, and it is an open question whether asphalt has gained anything. Whether or not the contractors for the asphalt knew in advance of the bidding, that they would be permited to use loamy gravel as aggregate in concrete, and thus be able to bid lower than they otherwise would, the fact remains that such inferior material was used, and had the same gravel been simply spread on the street, without any cement whatever and thoroughly rolled, it would have made a better and firmer foundation for any kind of a pavement than the so-called concrete that was used in this improvement. If this payment stands the wear of traffic, it will demonstrate one fact at least, and that is, that engineers, in general, make very *expensive blunders* when they insist on expending money on good, substantial concrete foundations for pavements, for such foundations are unnecessary if the so-called concrete put under this pavement proves success as a foundation.

EX OFFICIO.

Written for the CLAY-WORKER.

CLAYWORKING IN ITALY.

BURNED CLAY, in one form or another, has been the most extensively employed material of construction in nearly all times and in all countries, and its use has been followed by some wonderfully tasteful and beautiful results.

In few countries does this fact impress itself on one more strongly than in Italy, where in the middle ages the skill of the clayworker was such as to enable him to do full credit in both brick and terra cotta work to the architectural style of that period, a style which the architects of the present day are not slow to copy.

The ancient Greeks seldom used bricks, but reared their temples of massive blocks of marble and other stones. The Romans, on the other hand, found that brick construction was much quicker, and employed it most extensively, erecting palaces, temples and other buildings, with the flat form of brick so familiar to us at the present day under the name of "Roman tile." In some cases, by the varied arrangement of the product, a very creditable decorative effect was produced along the cornices or in vaulted roofs, but in most cases the brick work was covered with polished slabs of marble. In the Roman baths it was found necessary to construct flues for conducting the hot air and water, and these were made of hollow brick with a thickness of half an inch. Just how they were molded is not known, but their regular form, their moderate thickness and freedom from cracks would lead us to believe that the old Romans were adebts at mixing, molding and burning clay.

Vase of Cantagallis Majolica, Florence, Italy.

As before mentioned, it was in the middle ages that the manufacture of structural clay products reached its highest development in Italy, and the specimens of it seen in such cities as Bologna, Pracenza, Cremona and Milan easily convince us of this fact. The facade of the Ospedale grande in Milan, for example, would have done credit to the modern terra cotta worker.

Curiously enough, since then this style of decoration has gradually receded from Italy to other countries, and another branch of clayworking, which also flourished in the middle ages, has taken its place. I refer to the majolica work, at first so successfully produced in Italy by Lucca della Robbia and his sons. This consisted of terra cotta reliefs, covered with glazes or enamels of different bright and contrasting colors. The subjects chosen were generally from the Scriptures, and served mostly for interior decorations.

In Italy at the present day the manufacture of majolica is still carried on, and many factories exist, notably around Florence, Naples, Rome and Nove. Through the kindness of

Signor Ulisse Cantagalli, who conducted me through the factory at Florence, I may give an account of the methods employed.

The clays used are calcareous, obtained from the hills near Sienna, and containing, perhaps, 15 per cent. of lime carbonate; a second, less plastic and more sandy, yellow clay, from near Arezzo; a third, red, sandy clay, from the valley of the Arno, near Florence. In addition, a fourth, red, plastic clay, from Belgium, is sometimes added to the mixture.

Strada di Marinella, Naples, where the tile are made.

In making the majolica a mixture of the clays is used, the proportions taken of each depending somewhat on the style of the product. The clays are mixed with water to the consistency of a slip, in a vertical cylinder with revolving arms, and then run off through a screen into the filter presses, where the water is squeezed from them. This semi-dry mass is then tempered thoroughly in a pug mill, after which it is distributed to the workmen.

The wares are molded on a jig-wheel, turned on a kick-wheel, or formed by hand in plaster molds. The last mentioned method is followed in the production of large copies of Lucca della Robbia reliefs, of which Mr. Cantagalli makes a great number for church decoration, and for large pieces the mold is made is many parts.

After thorough drying, the wares are burned at a low, red heat in the upper part of the two-story kiln. After this it is still very absorbent, and is dipped in the glaze, which it greedily absorbs. The decoration is appiled with a brush on the unburned glaze, and during the burning, which is done in the lower portion of the kiln, it sinks into it, producing something of an underglaze effect.

Temple of Romulus in Roman Forum, Showing Arches of Roman Brick.

The colors used are all metallic oxides, and the finished product shows a series of brilliant tints, which, while they do not shade into each other, are, nevertheless, quite attractive.

Saggers, made of French fireclay, are used to inclose the ware in the kiln, and the progress of the burn is judged by means of test pieces covered with glaze.

Much Gubbio ware is also produced, its special character being the presence of metallic luster or sheen, which, at times, is iridescent. This is brought about by subjecting the ware to a third firing, in which the action of the fire is reducing, thus causing a reduction of the metallic salts in the glaze to a metallic condition.

In many of the della Robbia reliefs made the figures are covered with a white tin enamel, while the enamel of the background is blue.

At Milan and also at Naples there are large factories for the manufacture of earthenware, but the china clay used is mostly imported.

As in many other European countries, clay tile is the favorite roofing material, the type of tile used being the common Spanish one.

Great quantities of glazed tile for flooring are made of calcareous clays, notably at Naples, where, almost any pleasant day, one can see the tilemakers at work in front of their little shops, which, together with macaroni factories, are scattered all along the Strada di Marinella, the products of each being spread out on the pavement of this public thoroughfare to dry in the sun. The tile are molded in wooden molds, much like common soft brick, and then stood up on edge to dry.

Ancient Palace, built of Roman brick.

They are burned in small kilns, and painted with a somewhat crude but symmetrical design, and are chiefly used for kitchen and hall floors.

Fire brick are made at Montalcino, and in Northern Italy hollow brick are made, whose special feature is their thinness, which is about three-eights inch. Combined with this is their strength, which is considerable. HEINRICH.

A Queer Notion About Advertising.

A short time ago a small weekly newspaper in Mexico published in its columns an advertisement of a business house. Another firm in the same business has sued the paper for damages, alleging that they have suffered loss through the publication of the advertisement of their rival.

And yet there are business men who question the value of advertising! If all the firms who have suffered loss because they did not advertise should enter suit for damages, the legal profession would have a boom, sure.

Written for the CLAY-WORKER.

"FLAME" ANSWERS "A CONSTANT READER," WHO SUBMITS PLANS FOR A KILN AND FOR THE UTILIZATION OF WASTE HEAT FROM IT, AND ASKS FOR CRITICISMS AND SUGGESTIONS.

YOUR PLAN is a novel one, and was, devised, as you say, for the burning of tile made of clay that "burns easily." You add, "My tile are a pretty cherry red, when we hit it, but, like poor marksmen, we miss too often, and there is no uniformity in the burn. When I see a down-draft kiln full of tile burned uniformly from top to bottom, and then reflect how pretty my clay would look when burned that way, I cannot but think of my kiln as worse than a balky horse. Some are burned too hard and some not hard enough, at a great waste of fuel."

Our friend cannot be blamed for desiring to better his condition, and his plan shows that he has given much consideration to the matter. He speaks of himself as having had but one year's experience.

His proposition is to build a down-draft kiln sixteen feet in diameter, to be filled once each week on Tuesday, fired Tuesday evening, and, when burned and cool enough to be safe, to draw the waste heat into his dry shed, and he presents plans embodying his own ideas as to kiln, etc., to accomplish this purpose.

With a view to helping others as well as the inquirer, the editor of the Clay-Worker has kindly consented that the answer be made through these columns.

Such sketches as are deemed necessary to make plain to others the plan under discussion are included with the answer. Fig. 1 is a ground plan of the kiln just above the floor line, with floor section broken away to show flues under the floor, and with a section of the wall of kiln removed to show method of discharging hot gases into the escape flues from the kiln. Fig. 2 is a face view of the six furnaces, which in Fig. 1 are designated A1 to A6. Fig. 3 is a vertical half section view of the kiln. Fig. 4 shows the manner of constructing the floor flues.

"Constant Reader" says he likes this plan, first, because the kiln will have a hot bottom, which cannot help creating a good draft in the flues, so carrying off the watersmoke; second. because of the convenience of firing from one side; third, because the waste heat can be utilized by connecting kiln with dry shed. Referring to Figs. 1 and 2, it may be state that while there are but six furnaces, there are eighteen floor flues, three connecting with each furnace. These floor furnaces, formed in the manner shown in Fig. 4 by laying five ordinary-size fire brick on top of each other and bridging them with another of the same kind forming the floor, the flue so formed being six by twelve inches. Two of these flues abut against each furnace as seen in Fig. 2, where part of the furnace, A6, has been removed. The third flue of the three said to attach to each furnace abuts at its end against the division wall between furnace A6 and A5, and so of each other furnace and flues in due order. The fire being started in furnace A6, the smoke and heat pass into the two flues opening into it. The right-hand flue discharges its contents into the kiln through an opening in the floor into a twelve-inch pipe, which answers as a furnace bag to conduct the heat to a point near the crown, as shown in Figs. 1 and 3, while the heat entering the left floor flue passes to the end of that flue, when through an opening it passes into the third flue, and returns, as shown by arrows where the floor is broken away (Fig. 1), to the point "2," where it also enters a pipe conduit, and is discharged into the kiln, as were the contents of the first flue. Each of the other furnaces operate in the same manner. Referring to Fig. 3, the kiln walls, which are twenty inches thick, are composed of a twelve-inch inner wall, then four inches of flue, and then an outer wall section of four inches. Through these wall flues the smoke and spent heat of the kiln are discharged, entrance to the same having been provided at the point in the wall just above the floor, as seen at b, b, b and c in Fig. 3. It will be seen that the crown of the kiln rests upon the inner eight inches of wall, and that the remaining twelve inches forming the wall thickness is carried up as high as the crown of the kiln, in order to insure a uniform draft through the flues.

Commenting on this kiln, the general arrangement and the manner of handling and utilizing the heat would seem to be good, a hot floor and a hot jacket for the wall, furnaces handily arranged. It gives a promise of economical expenditure of fuel, and uniform burns. There may be a clogging of the long floor flues, but these are not hard to clean, and there may be need to throttle somewhat the discharge opening of the short flue, in order to equalize the draft. When it comes to the details of construction, we find what we deem grave errors in the proportions of some of the parts.

Referring to the furnaces, we are told the portion above the grate is designed to be twenty-two inches wide, twenty-four inches high and five feet in length, while the ash pit is to be twelve by twelve by thirty-six inches. Now, an ash pit should be as wide and long as a fire box. Three inches of wall ledge on each side of the grate, and a solid wall for a floor to the furnace at the end of the grate, would call for a large waste of fuel and of labor in keeping free from ash and clinkers, and would prevent a clean fire.

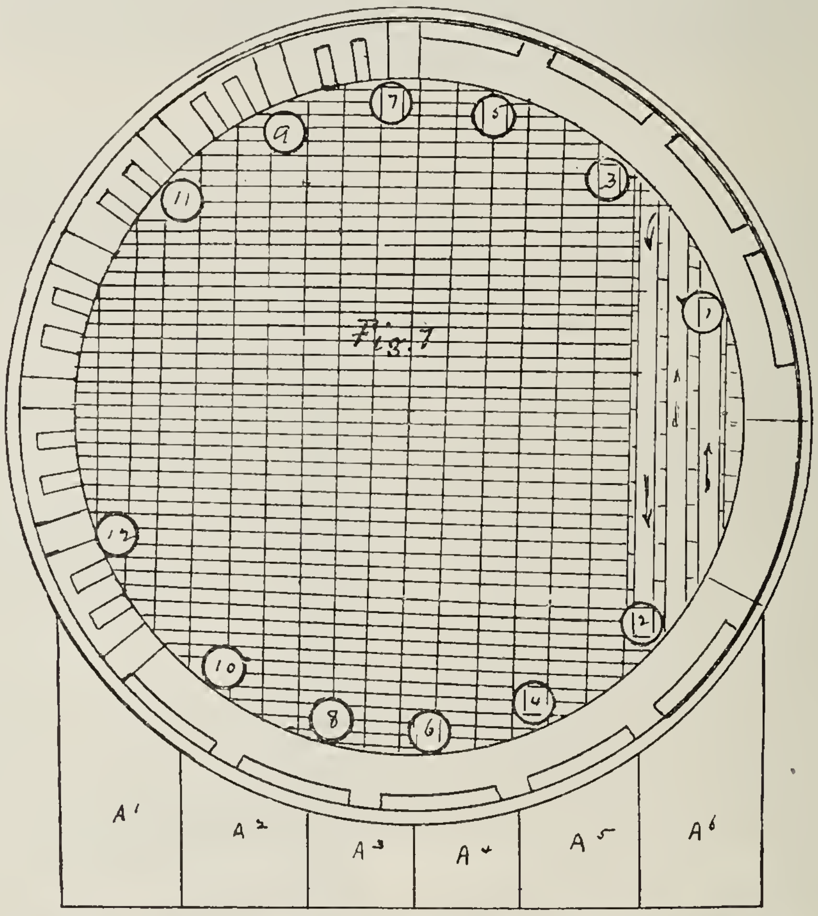
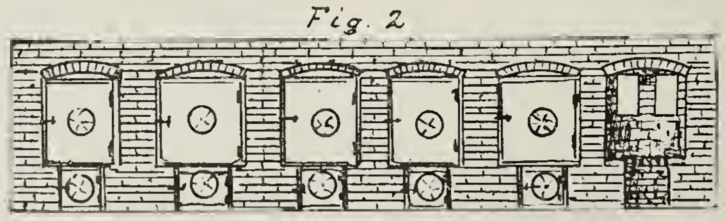


Fig. 2



For the size kiln proposed, we believe that six furnaces having a grate surface of four feet each way (say sixteen by thirty-six inches of grate) will be ample, if coal is used for fuel. It would be a good idea if eighteen inches of space between furnace doors and grate was given to a coking plant, thus making full length of furnace four and a half feet. Money may be saved by partially coking fuel before it reaches the grate bar. If the dimensions of the furnace given had reference to the use of wood for fuel it may not be far from right, but for coal a cross section of sixteen by eighteen inches would be abundant.

Assuming that the floor flues are as stated, six by twelve inches, the openings from them into the kiln should be no less. The twelve-inch pipes for bags are all right. He asks if these pipe must be sewer pipe, or whether it would be possible to use unburned twelve-inch tile instead, and are informed that the clay will stand a white heat for thirty hours. It may be worth while to try the experiment. Much depends upon the clay and much upon the careful firing. We next notice the wall flues through which the waste heat is to escape. According to the plans there are twenty-two to the kiln, and these are either four by twenty-two or twenty-six inches, we cannot determine which, but, if four by twenty-two, the aggregate area of the whole is 1,936 incnes, while the total area of the floor flues is but 864. Such a disproportion would result in checking the draft, and the flues are otherwise objectionable. Leave out the door and give a flue four by twelve inches to every two and a half feet of the remaining wall, and the flues would be of ample capacity to do the work well. Care should be taken to make the entrance to tne flues equal to the flue area.

We do not think an outer wall of four inches, as shown, would give good service. It will be evident that they will be much less objectionable if the flues are narrowed near one-half, as has been suggested, but it would be better still to place the flues in the middle of the wall, leaving eight inches of thickness for both the outer and inner wall sections. We have had our say about hollow walls, and about the best methods of constructing a kiln wall, in another article in December number of the Clay-Worker, and we need not repeat ourselves here. If we were building the kiln in question, we would not carry up an unbroken wall above the base of the crown. The reduction of the flue area suggested will permit the carrying up of chimneys instead. Such a catch-basin for rain and snow would soon greatly injure the kiln. As to laying a second crown a few inches above the crown shown, we will reserve answer, as this matter will be fully treated in our article in a subsequent issue, which takes in the subject of crowns. As to the height of crown for the kiln in question, we think a rise of three and a half feet should be quite sufficient.

We now come to the plans proposed for the utilization of the waste heat from the kiln. Figs. 5 and 6 show what these plans are.

It will be seen that the kiln "A" is near the dry shed. "B," which is represented as made of matched lumber, is twenty-two by eighty feet on the ground and seven feet to the roof, and is "full of doors on the sides." Fig. 5 is a vertical sectional view lengthwise of the kiln, and Fig. 6 a vertical cross-section view. The operation of drawing the heat into the shed is stated to be, first, stop all the smoke flues, and then open flues leading to a two-foot diameter sewer pipe, shown at "C" in Fig. 5, which is laid under ground from kiln to dry shed. The hot air of the kiln is drawn through this pipe by a fan, which, forcing a current of cool air into the pipe and discharging it in the direction of the dryer (see pipe at "a"), draws the hot gases of the kiln along with it. The sewer pipe connects in the dryer with an open tunnel two by two, running through the center of the dryer its full length. The goods to be dried are brought in on a rack, and "there is a free circulation under and up through the tile."

We are asked for an opinion as to the probable effectiveness of such an outfit and procedure. The method of drawing the hot air from the kiln may be called a good one, the details being properly carried out, and it will certainly do that part of the work and deliver the heated air into the open tunnel, but we run no risk in guaranteeing that none of this heated air will pass out at the open door at the far end of the dryer, which it is proposed to leave open for that purpose. The lines drawn to show heat currents in both Figs. 5 and 6 give our views of what disposal the heated air would make of itself after being dismissed from the covered tunnel and its introduction into the dry shed.

Fig 5

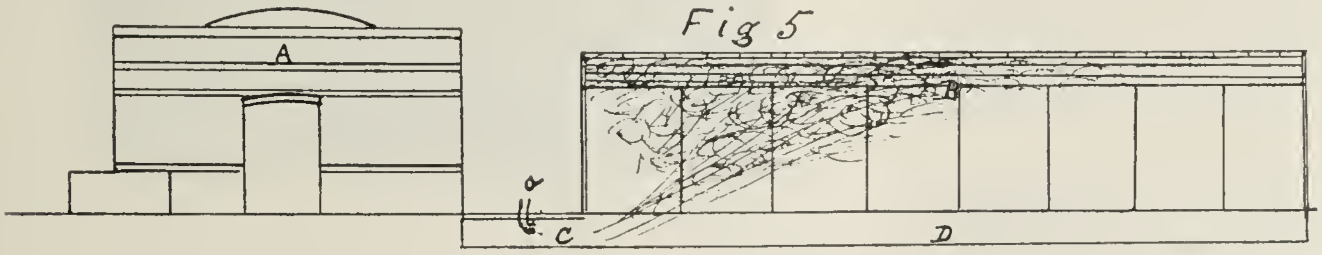
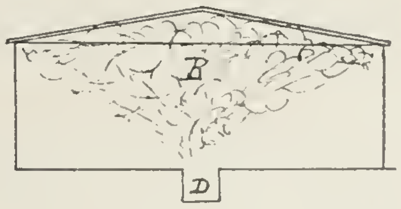


Fig. 6



There will be no sensible current twenty feet away from the discharge end of the two-foot pipe, the hot air will have arisen by as direct a route as it can find to the top of the building and will find its way along the under roof and mainly above the wares, seeking every avenue of escape in cracks, in the sides of the sheds, which, being composed of doors, will permit, with the openings in the roof and between roof and sides, no matter how well constructed the shed may be, ample avenues for the escape of all the air introduced into the shed before it has reached the center of it, and we think it safe to say that not half of the shed will have been touched by the air introduced from the kilns, as the fan blast has drawn from the kiln its heated air, so whatever current of air is made by introduction to the dryer will serve to draw into the shed through the cracks under the many doors outside air to dilute the current. We have here none of the conditions to utilize successfully a blast of dry hot air, our shed is too broad for it to diffuse itself in, and it will seek and find an unobstructed way for itself, above the wares very largely, and so out through the thousands of small cracks and openings sure to be found in such a structure.

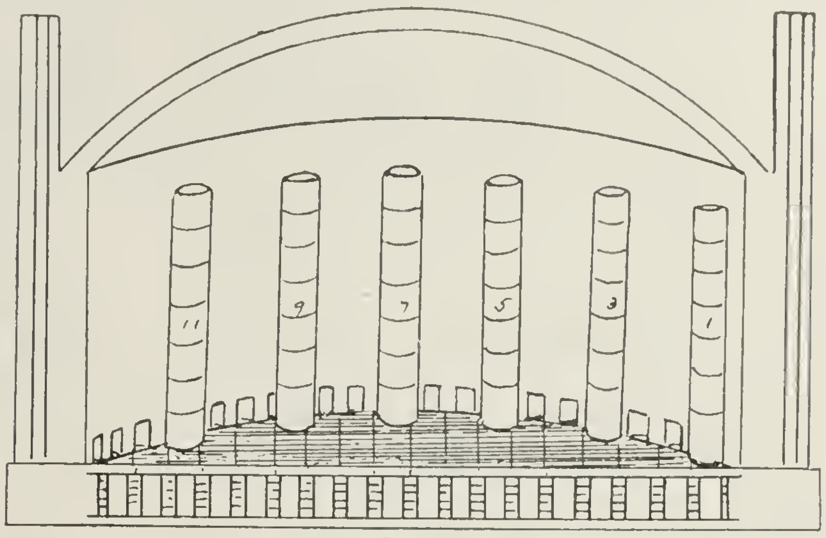


Fig. 3

Perhaps we can make this plainer by attempting to deal with this volume of hot air in the way most likely to distribute it throughout the full length of the building. Suppose, then, we cover the open tunnel in our dry shed, leaving a crack five-sixteenths of an inch wide between the planking once every foot. Before we have reached the end of our shed the total area of these cracks will have amounted to more than the area of a cross section of the tunnel. Does "Constant Reader" believe that the hot air which passes through one of these openings (five-sixteenths by twenty-four inches) will have much effect upon the air contained in a running foot of the dry shed, each foot of which contains upwards of 150 cubic feet of space, especially when the character of the drying structure is considered?

To use such a hot air current effectively we must have entirely different conditions, one of which would be a practically air-tight compartment, except at the points at which we desired to dismiss the air introduced into the kiln, and, second, means for compelling the hot air to distribute itself evenly throughout the dryer, both of which conditions are altogether wanting in the case before us. FLAME.

To the Editor:

We take this earliest opportunity of correcting a statement made in our third paper on kils, which appeared in your December issue.

The general statement made in that paper concerning the value of air chambers for the purpose of non-conduction of heat or cold were correct, but when we stated that the only cases in which the employment of asbestos, mineral wool, etc., for non-conducting purposes was where it was more convenient to secure air cells than to secure them by other methods we were in error.

Our mistake arose from not giving due consideration to the heating of the confined air by connection. When the air chamber has a heated wall on one side, the air in the chamber in contact with that heated surface, being heated by such contact, begins to ascend, and so a movement of air commences which brings the cooler air of the chamber in contact with the heated wall. The principal value of non-conducting material is that it furnishes a multiplicity of chambers which are so isolated from each other that these air currents are prevented in large part.

We do not need to revise our statement concerning the value of hollow walls of kilns, but in the interest of truth to correct the misstatement regarding relative value of non-conducting materials. FLAME.

IOWA AND NEBRASKA FIRST JOINT CONVENTION,

SIOUX CITY, MARCH 1ST, 2ND, 1899.

THE CORN PALACE CITY THROWS WIDE HER GATES TO THE CLAYWORKERS.

THE MOST INTERESTING event of the winter to the clayworkers of Iowa and Nebraska occurred March 1 and 2, when the first joint Convention of the brick and tilemakers of those States was held in Sioux City, Ia. Despite the unusually severe weather that had prevailed for weeks, there was a satisfactory attendance, and the warm welcome extended to the visitors by the local committee induced an atmosphere of cordiality and good feeling that made the occasion one of much pleasure to every participant.

Under the leadership of C. J. Holman and W. B. Lower, the local brickmakers welcomed the delegates on their arrival, and by personal attention made each individual feel that Sioux City and all that it contained was at his disposal during his stay in the city. The meetings were held in the ordinary of the Mondamin Hotel, an excellent hostelry, that provided for the wants and comforts of the guests in a manner that left nothing to be desired.

From the complimentary remarks of the officers and old-time members of both Associations, the Convention was evidently, in point of enthusiasm and interest, the most successful yet held. The experiment of a joint Convention was so satisfactory that it will probably be repeated each alternate year hereafter. Omaha will be a likely candidate for 1901. Undoubtedly a splendid Convention could be held there, for her brickmakers are themselves interested in Association affairs, and Omaha's location and railway facilities make it easily accessible from both States. This exchange of hospitality by the clayworkers of adjoining States must, in the nature of things, prove helpful to all, and as the pleasures and benefits of such gatherings are better known and appreciated the attendance will increase until in time all of the progressive and enterprising men in the business will be included on the membership roster.

THE FIRST SESSION.

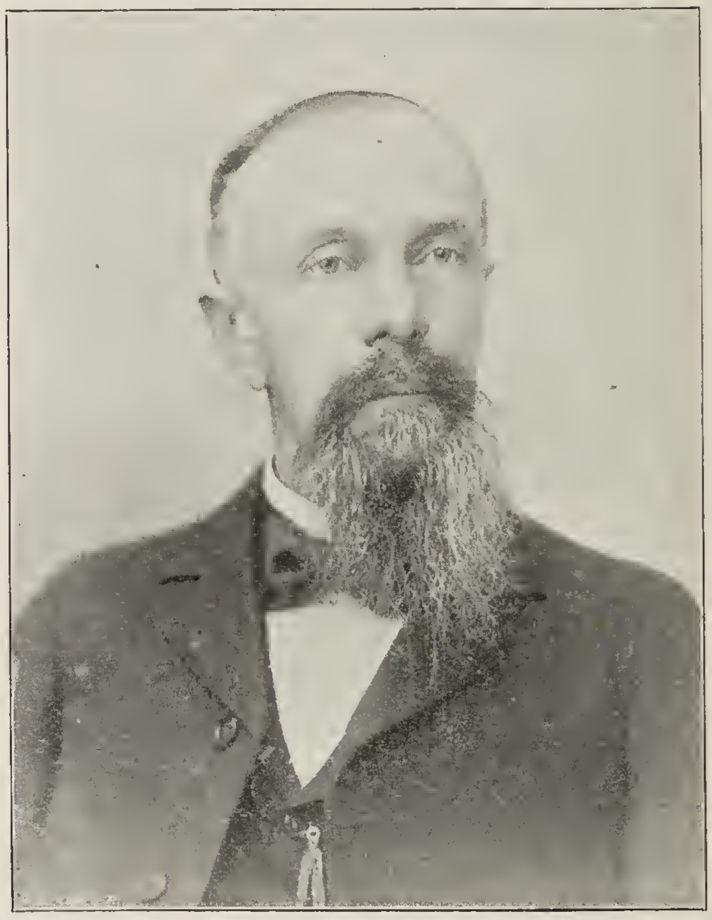
The Convention was called to order by C. J. Holman, President of the Iowa Association, at 10:30 Tuesday forenoon. He bade the visitors a hearty welcome, and expressed the earnest wish that each and every one in attendance would take an active part in discussing the questions of common interest that the programme provided. President J. Fred Smith, of the Nebraska Association, occupied a chair to the right of President Holman, while on his left were the two Secretaries, W. H. Bushell and Robert Goodwin, jr.

AN IMPROVED TRADE SITUATION.

President Holman requested the Secretary to call the roll, and as he did so each member gave a brief report of the condition of the brick and tile business in his locality. Almost without exception, the members spoke in a very cheerful vein, telling of improved trade conditions. The demand for both brick and tile was greater than for a number of years; few had any considerable stock on hand, and prices were reported better, though still lower than in reason they ought to be in some localities. This was the only complaint made, and it is quite evident that an era of prosperity prevails in nearly every section of these great corn-growing States. Among the delegates were representatives of a number of machine firms, each of whom told of busy factories running on orders for machinery, etc.

THE MAYOR'S WELCOME.

Mayor J. H. Quick appeared on the scene and was introduced by President Holman, and spoke facetiously, bidding the clayworkers a most cordial welcome and assuring them that they could go where they pleased, when they pleased and stay as long as they pleased. He said that, while he had never been directly interested in claywork, he appreciated the importance of the industry, and expressed the wish that the results of the Convention would be satisfactory to the visitors, as he was sure it would to the local brickmakers, provided every one had a good time. He thanked the members of the Association for meeting in Sioux City, stating that it was always a pleasure to welcome visitors to the Corn Palace City. He had often observed that the character of a man's work impressed itself on the man himself; the dyer's hands are always stained with the materials he handles; that the gentlemen present bore the appearance of being like their product—square, true, possessed of the right kind of sand, and that, in short, each one was a brick. The Mayor's manner was most



C. J. HOLMAN, President Iowa B. & T. Ass'n, Sergeant Bluff, Ia.

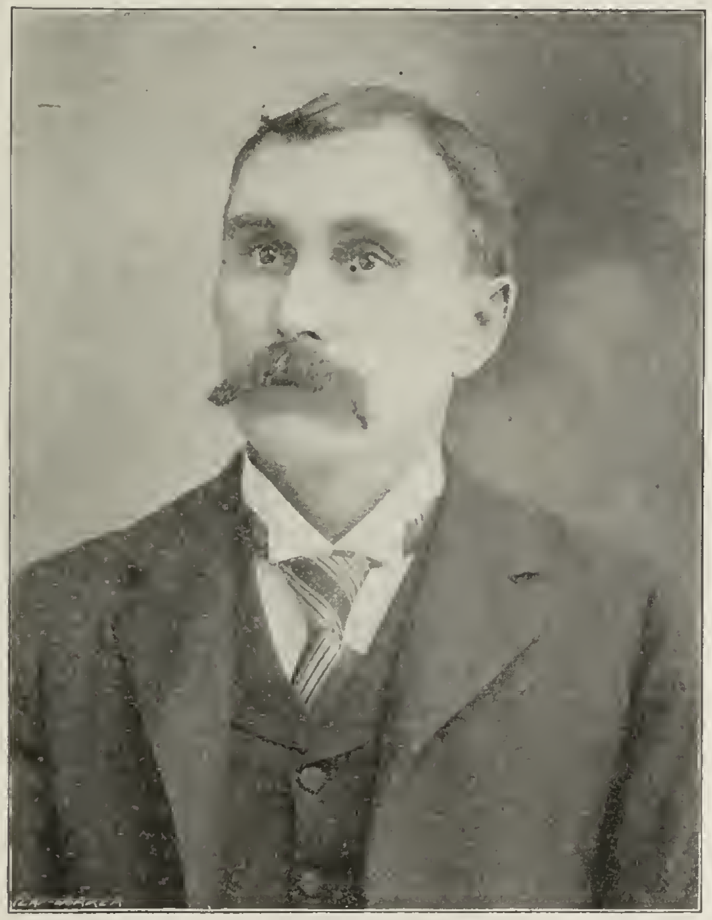
pleasing, and when he closed with the statement that the little ribbon which each delegate wore would be a badge of immunity from any interruption from any one, police officer or civilian, and insured for the wearer anywhere in the city a hearty welcome, he was roundly applauded, and, at the suggestion of Mr. Randall, was decorated with the badge of the Association.

PRESIDENT'S ANNUAL ADDRESS.

C. J. HOLMAN, SERGENT'S BLUFF, IA.

Gentlemen of the Convention:

We have assembled here to-day as representatives of one of the oldest industries in our land, an industry so old that history fails to record a beginning; and, while there have been many pages written and much interest taken in the manner and methods employed in the making of brick in the ages past, it is not of the ancient history of the industry that we have to deal to-day, but of the present and future and their possibilities that is of more concern to us at this time. Brickmaking has always been a pioneer industry. Hardly a country can be found, where civilization has gained a foothold, that some form of brickmaking has not been introduced. But, so far as we have reliable data or any knowledge, the manner of making and burning has been, in all countries, along a well-beaten track for many generations, where for centuries the old soft-mud, open-yard process has been the same and the only way that brick have been made. But, during the last score of years, great changes have taken place in all branches of the clay industry, until to-day the business stands on a higher plane. Capital and machinery have been brought into use, new methods of burning introduced, invention has followed invention, developing a high standard of skill, until the brickmaker of to-day, having discarded the old mud apron, stands dry shod and clean shaved in his brick factory, master of the situation, and energetic and devoted in his calling. What has brought about this great change within the experience of many of the members here present to-day? We say "progress," but to those of us who are familiar with the workings and benefits of our State and National associations we can trace most of this progress to the thoughts and ideas that have taken form and have been put into practice as a result of these gatherings. Here the wants of practical experience have met the desires of capital and machinery; new methods of burning have been discussed and adopted; old theories and practices have been dropped, one by one, until we must recognize that since the organization of our National Brickmakers' Association more progress and greater improvements have been made in the line of brickmaking and clayworking than during the balance of the nineteenth century. And, while the National Association has been of great benefit to the clay industries of this country, there is much for our State organizations to do. Here, we come together as neighbors and competitors, often in the same field, our interests are local and mutual; competition often brings us together in the same market. Here, we should build up associations and friendships that will work to our mutual advantage, recognizing each other as honorable competitors; that each and all are in the business to stay. Being actuated by the same interests and desires for remuneration and profit we can put into practice what we all know—that a good price obtained by a neighbor is a stimulant to the market; that it is much healthier to all concerned than the habit, too often practiced, of cutting the price to secure a sale which by right should go to another. The maintaining and support of our State associations should be of interest to every clayworker in the State. Much can be learned by friendly intercourse and exchange of ideas, improving by each other's experiences, familiarizing ourselves with our brother's methods of manufacturing and burning; and, by a united effort, seek to enlarge our market and increase the demand, remembering that our largest competitors are other kinds of material so largely used in construction. Let us make our brick so durable that they will take the place of stone, and so sightly that buildings of wood and other material shall be secondary to brick and terra cotta; and right here let us ask ourselves if the increase of consumption does not rest largely with ourselves, the brickmakers; that whenever we are inclined to cheapen our product to meet competition we do the very thing to injure our trade and bring our material into disrepute. Rather let us add to the cost by making better goods, more durable and of such quality that the customer, although paying a good price, is always pleased in the end by knowing he has received a good article. This is particularly the case with all public improvements, such as paving and sidewalks, and, in this age of advancement, and with the dawn of prosperity now so well established, a higher standard of quality is demanded, if we would keep pace with the times and keep our wares to the front.



J. Fred Smith, President Nebraska B. & T. Ass'n, Omaha, Neb.

How can we better accomplish these results than by attending and keeping up our organizations, making them a source of education to the craft, and, by a united effort, seek to place our "ancient industry" upon a still higher level and in keeping with our twentieth century civlization? We recognize the fact that great improvement has already taken place during the last decade in the finer goods, such as terra cotta and ornamental brick, but in common brick, which go to make up the great bulk of the superstructures of our country, in many cases quality is sadly deficient, the remedy being largely in our hands.

To foster and encourage the growth of our State organizations, I recommend that our annual gatherings be held in new localities each year, by invitation, thereby creating an interest which is not possible if we follow our old custom of meeting at the State capital regularly, thereby becoming monotonous, a condition which most brickmakers will class under the head of "over-production." By thus changing our location, familiarizing ourselves with all parts of the State, much more knowledge can be gained, a livlier interest taken and a stronger society maintained. To this end let us each take upon ourselves the duty, so far as we can, of making the next annual convention of more interest, and a larger attendance than any heretofore held in our State.

Secretary Goodwin read a communication from Sioux City's Social Club, inviting the delegates to visit the clubhouse at their pleasure during the Convention. In return a vote of thanks was tendered the club for the courtesies extended.

President Holman: The next in order is a paper on "The Future Outlook of Drain Tile," which will be read by the Secretary, the writer being unable to be present at this session.

THE FUTURE OUTLOOK OF DRAIN TILE.

BY J. L. RANEY, FAIRFIELD, IA.

A full discussion of this subject covers so wide a field that it is impossible to treat every phase of it in a paper of such length as is proper on an occasion of this kind. I shall, therefore, confine myself to the presentation of a few of the leading and more prominent phases of the question.

I might say as an axiom that "the future of drain tile is what the manufacturers make it," and the truth would be so self-evident that no one would dispute it. This being true, the trend of this paper will be along the line of the duty of the manufacturer of drain tile to the future of his business. I wish to present this under two heads. First, his duty in the matter of educating the public. The success of any manufacturing industry depends wholly on the demand for its products. People will use what they need, or rather, what they realize they need. It follows, therefore, that the first object to be obtained is, that the general public should fully understand the benefits to be derived from the use of drain tile. Once convince a man that a certain course will benefit his pocketbook and he is willing to do that which will bring to him that benefit. I fear that comparatively few manufacturers are able to give clear and intelligent information on this subject. I am very sure that it is rare thing to find a land owner who fully realizes all that is to be gained by tile drainage. When you find one who does fully realize its benefit he is sure to be a man who has learned this by his own practical experience.

The first point then on which we should attempt to convince the farmer and land owner is, that it is for the good of his pocketbook to use drain tile. This accomplished, the future of the drain tile business is established beyond question. This should not be a difficult matter if it were pursued systematically. The facts are all on our side. The experience of men who have tested it combine to establish our claims. We believe that we are safe in saying that every person who has ever tried draining his land, whether high land or low land, who has used good tile and laid it properly, will pronounce it a financial success.

To do this we want to convince people especially of two or three things. One is that land is as much benefited by being thoroughly drained in a dry season as it is in a wet one. Another is that drainage is as beneficial to high land as to low land, and that it is not alone the low, swampy land which is improved by the use of drain tile. Another is the benefits to the public highways that may be obtained by the intelligent use of drain tile in the working of the same. The argument in favor of each one of these three points is to be found largely in the experience of those who have tested them.

One of the difficult points for people to understand is, that land may be benefited as much in a dry season as in a wet one by being thoroughly tile drained. People get the idea that the only use for drain tile is to carry off the surplus water. It is true that this is the first and primary use. But when people are made to understand the benefits that come to the land by the passage of the air through the tile the increased porousness of the soil and the thereby increased amount of capillary action in the soil, and the increased depth of soil obtained, they will readily understand how it is that drainage benefits the crop in a dry season equally with the benefit received in a wet one.

The best argument that any tile manufacturer can bring to bear to convince a prospective customer of this point is to be able to either show him the results, if it should be a dry season, or drained land, or to have him talk with a party who has used drain tile and knows the results from practical experience.

If the manufacturer is attempting to make sales in the dry seasons he should have in view a few places where the land has been thoroughly tiled, and where the results of the work are shown in the increased growth of the crop, especially a corn crop, to which he can specifically refer prospective customers.

Another point on which he should be able to give definite information, and to convince people of the value of drain tile, is its effect on high land or rolling land. It has been a common idea that only flat, low lands needed drain tile. As a matter of practical experience it is shown that the beneficial results where rolling and high land has been drained are fully equal to those in the low and flat lands. This is especially true where there are spouty places on hill sides and in the sloughs in the rolling lands. What we need is that a few farmers in various communities shall have the experience that Mr. D. O. Loy tells about in his poetry quoted before the Illinois Convention a few days ago, in which he says:

> "I have tiled every pond, and I have tiled every slough;
> I have tiled every foot of my high ground too.
> I don't care for the money it takes,
> Since my whole family is cured of the shakes.
> And my children, sir, just do it up brown,
> For they go with the tony young folks of the town.
> Mary, she's visiting folks in New York,
> For I'm the wealthiest farmer that lives in the Fork—
> The result of draining high ground."

The same course should be pursued with reference to this subject as indicated above. Practical examples being the best argument, and the statement of people who have tested the matter for themselves, and can speak from actual results, being the second best argument to be used in convincing people in regard to these matters. The future of the drain tile business is especially affected along these lines. There is practically no limit to the future demand for tile, when people generally are convinced of its beneficial effects in all kinds of seasons and in all kinds of lands.

The rapid increase of population in this country, the fact that vacant lands, of any value whatever, are no more to be found in this country, will result in a more perfect cultivation of all the lands of this country. The time is soon coming when the question of the land owner will be, how to get the very highest amount of produce from his land. And he will be willing to use any and all means that tend to increase the productiveness of his farm, be it large or small.

One of the first things to which his attention will be called, if manufacturers do their duty, will be the benefits to his land from the use of drain tile. This insures a continual increasing demand for the product of the tile factory.

There is another use of drain tile which manufacturers should encourage by every means in their power. That is, its use in the improvement of highways. Already throughout this country there is a strong and increasing sentiment in favor of good roads, and already one of the results of the agitation of this question is the use of drain tile on the public highways. Its benefits are beyond question. In fact, any other improvements that may be made in highways will but increase the demand for the use of drain tile in connection with them. The enemy of good roads is water, and the first object to be attained in the perfecting of our road system is to provide for the most speedy means possible to get rid of the water that falls on the highway. And in all cases there is no better means than the use of drain tile. So that the agitation of the good roads question can but result in an increased demand for drain tile.

On all these subjects there is need for special information to persons especially interested or becoming interested in the subject. But, after all, the largest results will come from a general diffusion of the knowledge of these matters among the people. I wish to make one suggestion as to the manner in which this may be done. If the manufacturer of drain tile would make it a point to see that his local paper gave, as a matter of local news, items concerning the work that is being done along all of these lines, and the results as they are shown on the different farms in his community he would accomplish much in the matter of general education. When the attention of the people is continually called to the facts in regard to these matters they soon learn to accept these facts without question; or at least their minds are so educated as to make them easily convinced when the matter is called to their special attention. It would be wise for the manufacturer in his community or in his territory, wherever possible, to acquaint himself with the character of the land and soil, and where, in his judgment, good results would speedily be apparent from the use of drain tile to make special efforts in that community to get some persons to make a start in the use of drain tile. And he can safely trust to the demand that will be occasioned thereby in that community to furnish him a market for his product.

One other point in this connection is worthy of attention, though little mention has been made of it in discussions of this question. That is, the effect on the health of the persons living on the land, and of the community, from the use of drain tile. The thorough underdrainage of the soil by which miasma and other unhealthy matters is removed from the soil and air is of undoubted benefit.

The second matter which I wish to discuss in this paper is the duty of the manufacturer to furnish to his customers a first-class product. Tile drainage properly done is, in any event, an expensive matter to the average farmer. And not only must he be convinced that it is a paying investment for the time being, but he must also be satisfied that the improvement once made will be permanent.

The quality of tile that is found on many yards is, of itself, a matter sufficient to discourage the prospective user of drain tile. When men come to look into this matter and understand it they will not be satisfied to engage in this business unless they can procure first-class tile of such quality as will make them reasonably certain that when the work is once properly done it is good for two or three generations at least. The average man looks beyond his own lifetime, and most men even beyond the lifetime of their children. And we should be able to thoroughly satisfy them that when land is once tile drained there is practically no limit to the length of time that the tile will last in the ground and be effective. The person who gives any thought to this matter will readily understand that he cannot afford to invest the money necessary to thoroughly drain land if there is a prospect that even a part of the tile which he will be compelled to use will not stand the action of water and the frost, and will not be a permanent matter for years to come. He will know that even one defective piece in a line of tile, possibly a half mile or a mile long, by giving way will stop up the drain and render ineffective all this line of tile. It, therefore, follows that the manufacturer of drain tile should, in his choice of location, assure himself that he has clay of the proper quality to produce a first-class article. He should so thoroughly understand the manner of working the clay, and use such care in the manufacture of his tile, as to leave no question as to the results with reference to the quality of his product. Nothing can be more discouraging to the prospective buyer of drain tile than to come on the tile yard and find a large per cent. of the tile cracked and broken. He at once jumps at the conclusion that his loss in the handling will be large, and his prospect for permanent improvement to his land doubtful, and he will at least engage in the business of buying and laying drain tile in a very conservative way. The permanency of this improvement is a point that should be prominently urged, and the quality of the product should be such as to warrant this argument being pushed to its fullest extent.

The farmer will readily understand that it costs no more to lay the very best quality of tile than it does to lay a poor quality, and as the laying of the tile is a large per cent. of the cost of the work he will naturally prefer to pay a good price for a good quality of tile rather than to lay poor tile bought at any price, and this will insure to the man who turns out a good product a good market therefor.

There is much more that might be said affecting the future outlook of drain tile, but it cannot be taken up within the limits of this paper. We believe the future of drain tile is bright, and that there is a continually increasing market for the manufacturer, if he does his duty along the lines indicated in this paper, and along numerous other lines that will present themselves to every thoughtful, earnest man engaged in the business. I repeat the axiom with which we started out in this paper: "The future of drain tile is what the manufacturers make it." (Applause.)

CLAY-WORKER.

D. W. TOWNSEND, Vice-President, Cherokee, Ia.

R. GOODWIN, JR., ecretary, Redfield, Ia.

F. A. STEPHENSON, Treasurer, Webster City, Ia.

Mr. Pike, Chenoa, Ill.: I desire, Mr. President and gentlemen of the Convention, to compliment the writer of that paper. It is both instructive and entertaining. It will be a good thing for tilemakers to distribute copies of this paper among prospective customers. If, on returning home, any of you can prevail on your local papers to publish it, do so by all means; it pays well to furnish local papers with instructive matter of this character, telling of the benefits of tile drainage. Those of you who want to extend your trade will do well to make use of the *Drainage Journal*, published by Mr. Billingsley, at Indianapolis. I am not now in the tile business. Last year I sold my tile factory, and since then have been devoting much of my time to tiling a farm town over in Indiana. Have put down a mile or more of large tile, the effect of which is not yet fully apparent, but I know from experience that it is only a matter of time when a satisfactory return will be realized upon my investment. When I was in the tile business I made it a practice to subscribe for a number of copies of the *Drainage Journal* for distribution among the farmers in my territory, and found it one of the best means of increasing the demand for tile. The idea prevails with some that in Illinois, where we began to tile several years ago, the business is petering out. This is not the case, by any means. The gentlemen who purchased my old tile plant recently secured an order for ten cars of tile, mostly sixteen-inch tile. There is enough tiling yet to be done to keep our factories going for years to come.

President Holman: I will appoint as a Committee on Resolutions O. T. Dennison, Mason City; J. B. McHose, of Boone, and Wm. Sutton, Table Rock, Neb. This completes the programme for the morning, so the Convention will stand adjourned.

SECOND SESSION.

The Wednesday afternoon session was presided over by J. Fred Smith, President of the Nebraska Association, who called the meeting to order at 2:15. Reports of members was continued, the Nebraska representatives speaking in the same cheerful vein about trade affairs as had those who had preceded them. The stock of brick and tile on hand was generally reported as light, with indications of increased demand with the opening of spring, which would insure better prices if rational business methods prevailed.

President Smith: I will ask Mr. Besley, of Council Bluffs, to tell us something of the paving brick interests in his bailiwick.

Mr. Besley: We began putting brick down in our streets eleven years ago, and now have several miles of brick pavements, which, with very few exceptions, are giving the best of satisfaction. In 1888 we began by putting down nearly four thousand square yards, using Council Bluffs brick. This was a sort of an experiment. The brick were not, strictly speaking, what we would now call pavers, but were hard burned building brick. The street on which they were laid is subject to moderate traffic. The brick are still in fair condition, and have never given any trouble or called for any repairs. The street proved so satisfactory that the next year portions of a half dozen streets were paved with brick, most of which were shipped from Lincoln. There were laid, all told, that year, nearly thirty thousand square yards of brick pavements, and, with one or two exceptions only, the brick have given good service and the streets are still in good condition. Each year since then about the same quantity of brick has been laid in our streets, and those of us who have given the subject of street pavements considerate attention are convinced that, for durability, economy and satisfactory service, a good brick street is better than either asphalt or wood. In fact, our experience with wood blocks is not at all satisfactory. We are also using hard burned brick extensively for sidewalks, and believe brick walks are better than either cement or stone, both of which are objectionable because of their slipperiness in wet and freezing weather. There is now pending in our courts several suits for damages against property holders for injuries received in slipping and falling on cement or stone pavements. Such accidents seldom or never occur on brick walks. I think that in our community there will be an increased demand for paving brick for both streets and sidewalks, and am considering putting in some new machinery and down-draft kilns to meet this demand for vitrified brick.

F. LEHMAN, Chicago.

Secretary Bushell: The next on the programme is a paper by Mr. Sutton, of Table Rock, Neb., on

EXPERIENCES WITH CONTINUOUS KILNS.

Mr. Sutton: Mr. President and gentlemen of the Convention, I have not prepared a paper on this subject. Hardly feel competent to go into the matter to any great length, for I am comparatively a new man in the business. I became interested financially in a brickyard a year or two since. The venture did not prove as profitable as I had hoped for, and I finally took charge of the plant myself. Since then have acquired considerable information, some of which has cost me dearly, but, as the plant is now in better shape, and we are turning out a more even product with less loss, I am much encouraged, and expect to continue in the business. My experience in the use of continuous kilns is limited. I have built a sort of a continuous kiln of my own design. It is a sort of an up-draft or clamp kiln, built in circular form. We fire from both the inside and outside of the circle. We watersmoke much the same as with an ordinary clamp at the start, and, when the heat is well up, introduce the heat from the adjoining chamber. It works very well. There are some pale brick, both at the top and bottom. I figure that there is a saving in the cost of fuel of nearly 60 per cent. over the old method.

Mr. Lehman, of Chicago: I am using a continuous kiln, of which I have a blue print, which the members can examine if they see fit—Mr. Lehman, with the assistance of one or two of the members, pinned the blue print to the wall, where it could be seen by all, and explained briefly the methods of construction and operation, and sent to the Secretary's table the following paper, which was read for him:

THE MOST PROFITABLE METHOD OF MANUFACTURING BRICK AND HOW TO IMPROVE SAME.

BY F. LEHMAN, CHICAGO.

The most profitable way of manufacturing is that one which enables the manufacturer to turn out the best possible article at the lowest possible cost, and if we have answered the first question satisfactorily we have also solved the second one, and the profit only appears after the goods have been brought into the market, and a first-class article will always demand a higher price and find readier market than an inferior one. It must be the aim of the manufacturer to procure the best machinery and arrange his plant in a manner to handle the material at the lowest possible cost, but it is of just as much importance that the different stages of the manufacturing process be conducted with a view to avoid as much as possible all loss of goods made in the dying and burning, which will reduce the profit. It is of the utmost importance that the clay should be prepared carefully so that the same will constitute a homogeneous mass, as such material is less liable to cracking and breaking. With deposits which are free from foreign matter this is comparatively easy, though different layers of clay are generally of different grades, and the uniformity of the manufactured goods depends on it that the mixture is thorough and homogeneous. But great difficulty arises if the clay contains gravel or other foreign matter; machinery has to be procured for its removal, and the question arises, Which process is the most effective and economical? During my experience of thirty years as a clayworker I have tried and inspected many different methods and have come to the conclusion that the slumming process is the one to be recommended. It is the only one by which the clay can be made thoroughly homogeneous at a low cost, while the dry process is very expensive and not as effective. The cost of slumming at our works in Chicago is about 43 cents per thousand brick, and I have exhibited some samples to show the improvement in the quality of the goods. It will be noticed that all heavy machinery, such as rollers, etc., is done away with by the process. In combination with this process, and to make the manufacture of the clay most economical and profitable, I would recommend the continuous process of burning for drying and burning the material.

A continuous kiln, if operated by experienced and faithful men, is the most economical system of burning, and yields an almost uniform burn, while the escaping heat can be utilized in drying the product without extra cost by arranging drying floors above the kiln and taking advantage of the natural tendency of the heat to rise, while the moisture escapes through openings in the roof of the structure.

The samples of slummed clay were burned in our continuous kiln at Chicago.

President Smith: The subject of continuous kilns is an interesting one, which we can follow up in a practical way this afternoon, when we visit the brickyards, as we will find continuous kilns at both of the plants that are to be visited, so we will pass this subject and listen to Mr. McHose, who has a paper entitled

THE MOST PROFITABLE WAY OF MANUFACTURING AND HOW TO MAKE BETTER BRICK.

BY J. B. M'HOSE, BOONE, IA.

Gentlemen of the Interstate Convention:

My subject raises all the vital points of successful brick making excepting only the finding of a market, but I suppose it may be fairly assumed that if the brick are made in the most profitable way and of the best quality they may be safely left to find their own market. I trust, however, that the craft will not expect to find in this paper the subject so treated that the "wayfaring man, though a fool, need not err therein."

It is not for any one to lay down any ironclad rules as to the most profitable way of manufacturing brick, for it is undoubtedly true that notwithstanding the supposed advance in the methods of making brick in the last score of years there is no one method that, by any general or common consent, has been accepted as the best method or the most profitable one. We have but to look about us to discover every possible way, from the crudest hand process that was practiced in the earliest ages to the most elaborate and expensive machine plants—all working in the same vicinity and within the shadows of our largest cities, vieing with each other in competition for business. It is also a fact worth noting that if these primitive plants do not make the most profits, they certainly do not make the greatest failures, nor so often go into bankruptcy.

While there doubtless are reasons for this state of affairs, it is not within the scope of our subject to follow them out. But the fact that the most primitive outfit continues to exist alongside the most modern plant, the latter aided by large capital, makes us hesitate about naming the most profitable way of making brick. It has been said that there is no royal road to learning, and it is just as true that there is no royal way to success in brickmaking. I think it can be safely said that there is no well-known process of brickmaking but what in some hands has been a success, while in other hands all processes and all machines have proven failures. Hence I believe it to be fairly deducible that the question is not one so much of methods as of men—not the most profitable way, but the most profitable man. But just here allow me to observe that it should not be too hastily concluded, even of the more successful, that the way of the brickmaker is the road to wealth. There is, it is true, within our ranks some wealthy men and corporations, but, I ask you, how many of these do you know that got their wealth at brickmaking? I venture to affirm that if we were to call for the list of brickmakers that had failed, this list, as compared with the first, would be most appallingly long. There is something about the calling that attracts the investment of men of wealth, but I leave it to you, gentlemen, to say how many within your knowledge have retired with wealth acquired in the business. So, if you wish to get rich, the history of brickmaking does not offer any splendid inducements. Neither do I think that any of the modern methods or machinery offer any especially profitable way. Inasmuch as I am myself a brickmaker, it follows that I have selected certain methods, and you might assume that I would consider these the most profitable. Still, I wish it distinctly understood that I do not consider my way the only way, nor, indeed, is it necessarily the most profitable. In deciding on a method of manufacture, the character of the clay at all times must be considered of the first importance, and, with this, the use that will be made of the product.

It is a very common, but erroneous, idea that all clay is simply clay, and clay will make brick. Well, most of us have learned—and some have had a bitter schooling—that not all clay will make brick. Some clays will yield to one process and some to another, and, by different processes, yield wares of different qualities. Therefore it is of the utmost importance that the nature of the clay be first thoroughly understood, the uses to which it can be put determined, and then adopt such methods as will work that particular clay into the desired product in the most economical way, always giving full consideration to getting the best possible quality of goods. To accomplish these results it is not possible to lay down any rule or prescribe any method that will apply generally without a thorough comprehension of the qualities and conditions of the particular clay to be used.

I may add to this last point that there is no man sufficiently skilled, expert or scientist, who can pass on this question without actually submitting the clay in question to all the various details incident to its manufacture, and thus determine by actual trial its nature and properties.

A few words regarding my own methods may not be out of place, as indicating what I think to be the most profitable way when applied to my clay, with my market and conditions.

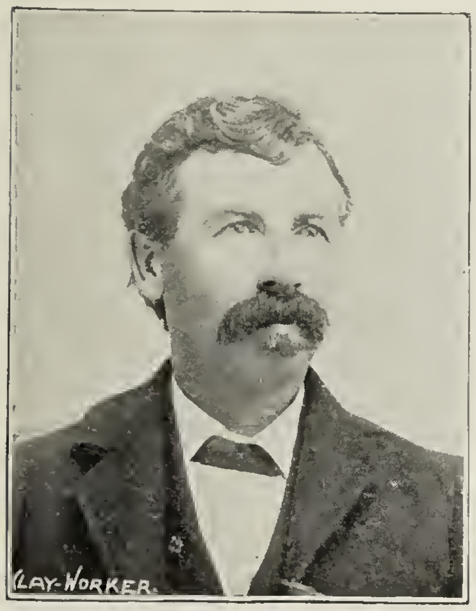
I use a shale or coal measure clay, with the works situated at the bank, using dynamite to loosen the clay. Load it into a car, haul by a wire cable up to the dry pan, pass into a pug mill, thence into an auger mill, and from an automatic cutter it is loaded upon iron cars, 500 brick on each, passed into steam heated tunnels, using exhaust steam by day and live at night. Dry in thirty-six hours, and pass by transfer cars directly into down-draft kilns, either round or square, and burn with coal.

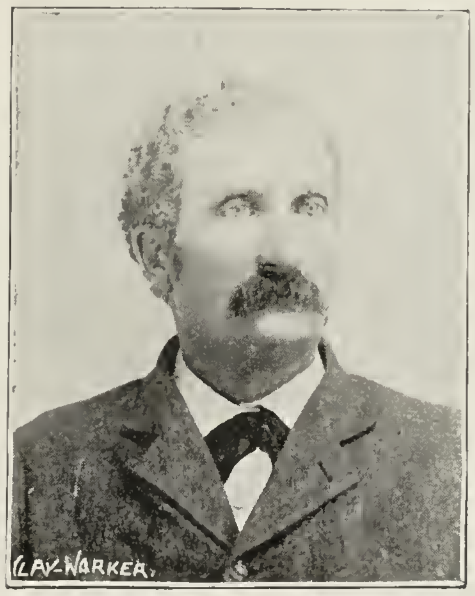
I do not know as any one of these processes or all of them combined can, with entire confidence, be called the most profitable way of making brick. Yet, under the circumstances, it is doubtful if there has yet been developed a better way, having in view also the quality of the ware.

Probably the ideal way of making brick is by the dry press method, but this also has its limitations, and its entire adaptability to shale clay is, perhaps, not well determined, and the writer has no practical experience that would justify a strong statement.

I have little to offer on the other branch of my subject, "How to Obtain Better Brick."

"Eternal vigilance" is said to be the price of liberty; it is no less the price of better brick, and without this qualification it is useless to expect better brick, no matter what be the kind of clay, process of manufacture, kind of machine or style of kiln.


CLAY-WORKER.
W. H. BUSHELL, Secretary, David City, Neb.


CLAY-WORKER.
J. E. STOCK, Treasurer, Lincoln, Neb.

CLAY-WORKER.
C. F. KAUL, Madison, Neb.

It is only the consistent attention to every detail, from the clay bank to the cooling kiln, that will give us better brick.

A brick perfect in every detail may be spoiled in the burning or even in the cooling, and a brick started with an improper or inadequate mixture of clay can, by no subsequent care in its manufacture, be a first-class article.

That better brick than those generally made in the past are being called for is, I think, conceded.

With the old hand methods in vogue twenty years ago those clays only could be worked which yielded readily to disintegration by water, though occasionally clay was spread out to secure the action of frost. These clays were generally of a loose, porous nature that would not make the hard, dense, strong and heavy brick that has been more recently put upon the market.

It has been but a short time since machinery and power have been applied to the better but harder and more refractory clays that has made their use possible.

I well remember, some forty years ago, when my father, who was making brick by hand of the common prairie clays, attempted to make brick out of some so-called fire clay. It is needless to say that the experiment was not a success, yet I can now see that the clay was capable of making a better brick than the clay he was using, but it required treatment very different from any then known. During the present winter I have been back to my childhood home, and critically examined that same bed of clay, and noting its possibilities, I could not help saying to myself: "So near and yet so far." In conclusion we observe that the most profitable way of making brick can only be determined by the local circumstances surrounding each case, and that the invention of machinery has done but little to solve the question, but much toward better brick by making available a better class of clays that could not be handled without it. Modern methods and machinery have done more toward producing better brick than they have toward cheapening the product. (Applause.)

President Smith: We are indebted to Mr. McHose for a very able paper. He has handled the subject so well that there is little need to consider it further, so we will ask Mr. Kaul, of Madison, Neb., to address us on

HOW SHALL WE HARMONIZE THE BRICK INDUSTRY.

C. F. KAUL, MADISON, NEB.

The above subject was given me to write upon. I do not think I can master the job, nor can I even hope to harmonize the brickmakers, though I would gladly do so were it in my power. The first suggestion I would offer in this direction is that we all make brick of one size and quality, and sell for one price per M, and let each man take care of his own town or market. This thing of a buyer saying, "I can get brick from the next town or yard for 50 cents or so less than from you—why can't you sell for the same?" is all wrong. We ought to sell for a uniform price, make a uniform brick, and stop decrying our brother brickmaker and running down his product. Boys, there is room enough for us all, without trying to crowd each other. What we want to do is to make a better brick, take more care in burning and drying, and then sell them for a better price, so as to pay for manufacturing. The manufacturer must be paid for his work, and the money invested in the improvements. If each one will try to make a better brick, not try to see how cheap you can make and sell them so as to beat our fellow craftsman out of a sale, we can sell just as many brick and sell them right, and put an end to this everlasting cutting of prices. This is one way to harmonize the brick trade.

By so doing we will increase the demand for our product, as well as our prices. A good brick is always worth a good price. If we don't get it it is our own fault. In 1894 there were 104 brickyards in good running order in the State of Nebraska. Not half that number were running last year. There is a good outlook for the coming season, and we will have to crowd our capacity to supply the demand. Can't we do business like other business men? See the retail grocer, the jobber—see most all other business men, way up to railroad companies. They are not doing business for glory, nor for the fun of cutting each other. I do not believe that very many of us ever count up the yearly expenses and the money we have invested in our yards, nor do we get anything for our own work. This would be a good question to discuss. Now, to have success, all brick men should join one of the State associations and get acquainted with each other. In this way they may be better able to harmonize and advance their own common interests.

President Smith: I have a paper here written by one of the young brickmakers of Omaha, which I will ask Mr. Randall to read to us The writer of the paper, Mr. Ittner, is made of that sort of stuff mentioned by Mayor Quick this morning, which is so essential in the makeup of a successful brickmaker —grit and sand. I have no doubt that he will overcome the difficulties of which he tells in his paper, and become a successful brickmaker.

SOME BRICKYARD EXPERIENCES.

BY HORACE H. ITTNER, OMAHA, NEB.

Mr. President and Gentlemen:

I find myself in rather a peculiar position, the reason of which is difficult to explain, as my name is not upon the programme, nor do I expect to be present at this Convention.

I was requested by our President to prepare an article, and, expecting to be present, I consented. Later the business which keeps me from being here to-day arose, and I wrote to Mr. Smith, asking to be excused. He notified the Secretary of my withdrawal and his own name was substituted. After that I saw Mr. Smith, and he urged me to write something on any subject, that Omaha might be represented on the porgramme by some one other than himself. Little realizing the difficult task I was undertaking on such a short notice, I agreed.

Although I was born in the shadow of his brickyard, my father, one of the early brickmakers of Omaha, died when I was quite young. My mother then moved with her family to the East, where I was educated. I was a stranger to the brickmaking industry until a very few years before engaging in it as my own business. My actual experience only covers two short years, and, while I am familiar with the advantage of machinery over the old methods of making brick by hand, I feel that I am thoroughly incompetent, by reason of inexperience, to tell of "The Advancement of Brickmaking in the East."

Just out of school, and wishing to engage in some business, I chose brickmaking, influenced by the fact that my father had been a successful brickmaker, and to work in clay seemed a hereditary inclination. My father was one of the nine brothers who have all been engaged at some time either in the manufacture of brick or of laying brick. And, strange to say, the sons of all my father's brothers except two are following some branch of the business. One of these is a lawyer and the other a chemist, but both learned the bricklayer's trade and have worked on brickyards.

Like every other person who has gone into the business without experience, I thought only of the large profits to be made, and not of the attendant trials and tribulations.

My yard had been idle for four years, but, to my inexperienced eye, everything was in good shape, and all that seemed necessary was to get up steam. I employed an engineer; then my troubles began.

During the time that plant had been idle some vandal had broken into the engine house and completely stripped the engine of its brasses and fittings. One hundred dollars was, I think, the first item of expense in putting the engine in shape to run.

Both machines, which seemed to be in such good repair, needed overhauling and repairs. The trucks and wheelbarrows had to go to the shops. When I saw the bill I began to get nervous. Finally I actually got started, and began to have my first experience with labor.

My first day was enough to discourage any veteran. I had not advertised the fact that I was going to start, but, in some way, the men found it out, and the place was overrun with them, all of whom (so they said) were experienced brickyard hands. I picked a crew for one machine and got them started, and, as everything seemed to be going nicely, got ready to run the other machine, which I finally succeeded in doing.

You do not need to be told how a brick machine will "buck" after it has been standing idle for four years. Every bearing needed oil, and lots of it. In spite of constant attention they would warm up.

I had put a twenty-year-old boy, who I knew had done the work before, in charge of the machine. Only a few minutes after starting, and while I was at the other machine, I heard shouting and alarming cries. I rushed back, and found that the boy, in attempting to oil a bearing under the machine, which he had been carefully cautioned not to do while the machine was in motion, had been careless, and crushed his hand between the cog wheel and a heavy driving beam. I was sick and ready to quit. I had neglected to provide indemnity insurance, and felt that I now was in for it. Visions of lawsuits and judgments stared me in the face. I called a doctor, and the hand was dressed. He would not lose it, but would be crippled. I asked the doctor for estimate of cost of attendance and care. The amount was higher than I expected, but I thought I would be getting out well enough. I leave you to imagine my disgust and profanity upon receiving a bill much greater than I was lead to expect. Together with medicine and nurse, this was another large and unexpected item of expense.

I made brick just one month with varying success, and by the time one kiln was burned I had exhausted my limited capital. Like new doctors and lawyers, I then sat down with what patience I could summon to wait for customers.

They were few and far between, and when they came I ran to meet them with an outstretched hand and a cordial welcome. In return I would get a cold nod and the question: "Have you any brick?" I would take them into the kiln and begin to dilate on the good qualities of my product. My expected customer would not commit himself, but climb upon the kiln and begin to knock the brick together, and out would come his rule, and he would make careful measurements, then he would inquire the price. "Why, I can buy them from so and so for such a price (naming a much lower price than I named), and your brick is not so large as so and so's."

My courage would fail me as he walked away, and I would resolve to make the next ones twice as large.

One day a man drove up in a buggy, and somehow I felt sure of a sale. He got out, tied his horse, shook my outstretched hand and asked the usual question. I showed the brick.

Said Mr. Customer: "Now, I am not so particular about having the best brick. Soft brick from the top, if they are cheaper, will answer my purpose just as well. What will be the price if I take a large quantity?" I told him. "Well," said Mr. Customer, "I will take 500," and he gave me the address.

I did not say anything, for orders were slow in coming, but I did some thinking. I sent a team out with the order, and Mr. Customer met the driver at the alley gate and said: "Just carry them inside, and pile them neatly against the fence." "Oh, no," said the driver; "if you will catch them I will toss them over to you."

He agreed, and the game began. Mr. Customer was not used to catching brick—soon got enough of it—and told the driver: "Just throw them over the fence, it will be all right."

Those bricks were soft ones from the top of the kiln, and the rough handling had broken them somewhat. In a few days he came rushing back, and complained bitterly. He could not see why he should pay for broken brick that he could not use. He made it so unpleasant that, in self-defense, I told him if he would send a wagon I would give him anything he wanted. He did so, but he does not know me when he sees me now.

Thus I began to learn of the joys of brickmaking.

I was game, however, and intended to get my price.

The season was slipping away, and as the days passed I lost my nerve. I finally made up my mind that if I intended to sell my product I must meet the price of my competitors.

Though I got into the business with little difficulty, I found it was not so easy to get out, even if I would.

After one shed of newly made brick had collapsed I realized that the posts will rot in an unexpectedly short time. I had to renew all posts and sills, repair roofs and rebuild sheds.

Kiln walls fell down the first burning, for the decay of dampness had got into it. Even the engine stack had rusted, and soon had to be replaced.

I have learned by sad experience that brickmaking is a hard struggle, and, instead of the big profits so easily earned, there has been only big expenses, lots of worry and poor living. In spite of all my troubles I like my profession, and would not give it up for any other.

I am looking forward for the time to come when I will have learned many things of which I now know so little.

I greatly regret that I cannot be present to-day.

Our Conventions are the brickmakers' universities. (Applause.)

HAND VS. MACHINE WORK—GENERAL DISCUSSION.

Mr. Corneer: I am a representative of the old style, hand-made school of brickmakers. I began work as a boy on a brickyard, and have kept at it ever since. When I had saved up a few hundred dollars I started up in a small way for myself, and I believe I can make brick by the old hand process without any machinery cheaper and easier than those who run big machine yards. I don't have any such trouble as Mr. Ittner tells about. I can get ready for work in the spring in a few days, and with almost no expense at all, while, as Mr. Ittner tells, there is always a big bill of expense for repairs, etc., in starting a machine plant. Maybe we will put in machinery one of these days when we get more money, but until then we are going to stick to the old hand yard.

Mr. Swift: I have been through the mill, made brick by hand just as Mr. Corneer tells about, and I would rather die than go through the experience again. I don't think life would be worth the living if I had to work and sweat, early and late, as a man must who makes brick by hand. I think a man is foolish who will make a slave of himself when he could just as well get machinery to do the work, and do it better than can be done by hand. I don't want any hand-made brick in mine.

Mr. Holman: I believe Mr. Swift is right in that it is better to use machinery, for in that way we can make a better brick and get better prices. While I have the floor I want to announce that the brickmakers of Sioux City have arranged for a banquet here in the hotel this evening. While tickets of invitation have been issued, the membership badge is all that will be required for admission, and we hope that every visitor will spend the evening with us, and that all will have a very pleasant time.

President Smith: If there are no further announcements the Convention is adjourned.

THIRD SESSION.

The meeting was called to order by President Holman at 9:30 Thursday morning.

President Holman: I have a letter of regret from Mr. Wild stating that he is unavoidably detained at home. However, he sends the following paper:

THE QUALITY OF PRODUCT AS EFFECTING THE INCREASE OF CONSUMPTION OF COMMON BRICK.

BY G. A. WILD, CEDAR FALLS, IA.

There is an old saying, "If anything is worth doing at all it is worth doing well," and there probably are but few adages that are more true in their meaning than this particular one. Especially is this true in its application to brickmaking, and particularly to the manufacture of common brick. If a common brick is worth the making, it certainly is worth making as well as it possibly can be made by the employment of proper methods and the necessary care required in all other branches of industry. Too often we hear the remark: Oh, they are only common brick and are good enough for that purpose. For what purpose? If for the inside walls of buildings, would the brick not answer the purpose better if they were more uniform in size, more even in burning, and, if a wire cut brick, had more perfect corners? If they are to be used for sewer or foundation work, do we not hear too often complaints that they are not hard enough or some are too hard, some not true enough, and even others are so defective in shape that they do not deserve the name of brick? If such so-called brick are good enough and answer the purpose, how much better would they answer if they were all well-made and well-burnt brick. Indeed, I believe our business relations would be far more pleasant if our brick were a little above the standard rather than below it.

G. A. Wild, Cedar Falls, Ia.

Any intelligent manufacturer of common brick must admit that methods employed twenty-five years ago are antiquated and not admissible now. Any one acquainted with the business at all must acknowledge the superiority of the machines now employed over the old hand process. They cannot conceal that a much better brick is made than formerly by the old method, provided, however, that proper care is given the business, and especially the attention of practical men is devoted to the brickmaking machinery. Not a little credit for this change is due to the machine men, although some of us may shrug our shoulders; yet I firmly believe that had we not had so many enterprising firms, with energetic men at the head of them, engaged in the manufacture of brickmaking or clayworking machines, the high standard of excellency of the American brick machine would not have been attained. That the American brick machines are far ahead of any of foreign manufacture we all will admit, and this result has only been reached by perseverance, competition and a sincere desire by many manufacturers to excel others.

With all this improved machinery at his command the manufacturer of common brick is placed in a position nowadays far better than that twenty or twenty-five years ago. Clays which could not be worked at that time can now be used not only for common brick, but can be put in all kinds of shapes, in the form of hollow brick, hollow tile and even terra cotta. Not only can these clays be worked, but, in a good many instances, a far better brick can be obtained than by the former methods. Think of the many blue, gray and white clays that were too hard, too sticky or too coarse to be worked by hand, and think of shale—what an excellent product can be made from it by the machinery now in the market!

In view of these advantages that surround the brickmaker of to-day, and in the light of general progress made in all other branches of business, let us ask ourselves one question, and, when answering this question, let us show a disposition to be fair to ourselves and our fellow-craftsmen. The question is this: Has the brickmaker of to-day improved the quality of his brick in the same degree as the machinery placed at his disposal has been improved, and has the demand for clay goods been materially increased with the supposed improvement in quality of the ware caused by the employment of modern methods in the manufacture of that ware? We want to be fair; it would not do to be otherwise when we have to solve a business problem. My answer would be that in some instances the manufacturer has earnestly striven to make his brick as perfect in quality as he possibly could by paying special attention to the selection of his clays and to the preparation of the same before they enter into the brick machine proper, and by erecting newly designed kilns where the brick can be burned well. In fact, we can point to a good many firms who have made quality, and not quantity, their standard. But there are a great many others, and, I think, these are in the majority, who have only figured, when they bought their machines, on making 40,000, 50,000, or even 100,000, brick per day. Of course, they are made, but how? They must be sold, and they are sold, even should the price be so low that it would hardly cover cost.

I am afraid, if we could look into the ledgers of some concerns and compare the two sides, we would have hard work at times to detect a balance, and perhaps in some cases that very balance would be on the wrong side of the ledger. And this we probably may find in a good many cases, and especially after a large contract has been delivered. I am glad to say that the writer of this knows of cases where this is not true, but he knows of cases, too, where it has been true.

The aim of some people seems to be only to make a large number of brick, regardless of what they can be sold for, regardless of their quality, just so they have made eight or ten millions of brick a year, whether the stockholders receive any dividends or not. Would it not be far better to make two or three millions a year only, make and burn them well, sell them to good parties at a fair compensating price, and make some dividends for stockholders? A well-made article will always look better than one poorly made, and a well-looking article will always sell better than one that does not have a good appearance. Let us make our brick just a little better than our competitor, and then we can always sell them at a good price, and if our competitor makes his brick just a little better than ours, of course he will sell his brick, too.

When strict attention is paid to every detail of brickmaking in the same way that the owner of the rolling mill attends to every branch of the steel industry, when the same thoroughness of details is applied in brickmaking, I think many of us can show a much better brick as the result of our efforts. The better the quality the better the demand for that article. If this holds true when applied to other products, why should it not be true in regard to brick? Let us all try and see how well we can make our brick, and perhaps by another year most of us can tell how much more we have sold than during the past year.

In conclusion, I would like to say a few words more in regard to prices and the regulation thereof. We all recognize the principle of supply and demand as a very correct one, and yet are there not circumstances and conditions, at times and at places, that make it almost necessary to even disregard this principle and adopt ways and means that will bring better prices to the brick manufacturer? We are gathered here as a Convention to exchange ideas, to tell our experiences, to get acquainted, but could not more be done right here if we would follow the example of conventions of kindred industries?

It is true the prime object of any convention is to harmonize and fraternize industries, yet were a plan evolved and carried out at this Convention whereby prices could be regulated and unfair competition restricted to some extent, would it not be of more vital benefit to the craft at large? I am not in favor of so-called trusts or combinations, whereby the prices are at times doubled, or even trebled. No, nothing of that kind. Yet I would rejoice over the advent of an organization of some kind by which we could protect ourselves somewhat from unscrupulous buyers and so-called unfair competition. One firm cannot supply all the brick needed in a certain territory, even if the price were so low as to defy competition, and yet some brickmakers think they can do that very thing. As a rule, they hurt themselves more than their competitors. If we could work harmoniously, with an understanding as to prices, a good deal more money would be in the pockets of the brick manufacturers at the end of the year and we would sell just as many brick. There is room for us all in the grand and large States of Iowa and Nebraska, and we can live and let our fellow-brickmaker live, too. (Applause.)

Secretary Goodwin: The next on the programme is a paper by Carl Nies. He, too, is unable to meet with us, but sends his paper, with the request that I read it for him.

MOST SUCCESSFUL WAY OF GOVERNING LABORING MEN.

BY CARL NEIS, BURLINGTON IA.

To handle men successfully: Firstly, you must understand every detail of the business you undertake to run. You must make rules to govern every department, and see that they are strictly enforced. Secondly, you must constantly be on guard to see that each one does his part cheerfully. When you find that one has to be driven to do his part, let him go as soon as you can find one to fill his place. Politely tell him you will have to do without his services, pay him off, and not fuss with him, nor tell the other men why you let him go, for, if they are worth keeping, they will know as well as you what was the cause .

If a man wants to quit you never argue with him to stay. Be ready at all times, if necessary, to part with the best man you have. Pay him off at once, be cheerful to him, give him your best wishes, and, if he is a desirable man, tell him if ever he should want a job from you in the future he would be welcome. This has a good effect on the rest of the men, for the most worthless one knows the good ones; this teaches the gang a lesson, and at the same time leaves an open door for the good man to return. If he returns, which is often the case, he will be much more contented with you than he was at first, and will be, therefore, of more value to you. If you pay different wages, always advance the old men to better pay, ing jobs; never hire a new one for the better paying place if you have one that has satisfactorily filled a place for less pay, and you are satisfied that he can and will hold down the better paying one. In this way you will encourage your men to stay with and by you, for they will all be looking forward "for something better," as they say, where, on the other hand, there will be no encouragement, and men will naturally feel like convicts in a penitentiary on life sentence—nothing to look forward to. No hope for anything better. "Hope"—gentlemen, take away our hope, and where would the brick business and ourselves be.

Do not discuss your business with them. Do not show partiality. Have no "pets." Be as pleasant to them as your station will permit, but whatever you do, do not become "chummy" with them, for as soon as you are their associate you have lost your control over them.

Meet all of your men off of the works as gentlemanly and as politely as possible. Many times you can accommodate and assist them outside of the works. Always be ready to help them in their trials of life, even if it should some times appear to you as unnecessary and unreasonable. In all of your intercourses with them be strictly honest and dignified with them. Have little to say, but what you say always make your word good. Often it becomes necessary to have them work overtime. Never pinch them on time; you better pay for a full hour, in case they work forty minutes, than to be reminded by them that they worked more than a half hour. Always pay as much as the best price for labor in your vicinity, for brickyard work is almost as trying as any, and if you cannot afford to do this, the sooner you close up your concern the better it will be for you. Have a certain time to pay, and pay at that time if you have to mortgage your cooking stove to raise the money, for nothing is more demoralizing than "pay day without pay." One demoralizing thing amongst men is the confidential tattler—the fellow that is constantly on watch to find out things to tell you about his fellowmen. He is the most disgusting creature on earth. He is to be found everywhere, and the manager of a concern that listens to him is in "hot water" all the time. He is not in touch with his men, and, therefore, not successful. On the other hand, men often come with grievances, sometimes on reasonable grounds, but mostly imaginary; always give them a respectful hearing. Never act at once, tell them you will investigate, and see what is in it and what can be done for him, but be sure and carry out your promise. In most cases he can be appeased, and to your benefit. Often men ask for some little thing of a trifling expense, which is of inestimable value to them in doing their part easier and better. "Do it;" in fact, it is not only your duty, but greatly to your interest to do all in your power to make the mens' tasks and burdens as easy as possible. I have seen brickyards, and their works, where no man could do a good day's work; where there was good machinery and appliances, but you could hardly take a step any place without danger of life or limb. This is the most important matter of all, and, I am sorry to say, receives the least attention. "Order"—now, gentlemen, I imagine you have become tired of this, but I cannot close without saying, look to the interest and welfare of your men. Keep discipline and order. Weed out the unruly and worthless men and you will be able to manage successfully, and with ease to yourself and men, and with profit to the concern. Be gentle and honest, and if you know you are right, and occasion arises, be firm as a rock. Furnish them good tools, and see that all of them are always, not only in good order, but also in their proper places, so that you need not look over the entire yard to find them.

Have a place for every tool, and after being used insist that it must be put there. You can educate your men to keep order or disorder, it lays with yourself. Take your choice.

I have no sympathy for a manager that complains about a worthless gang of men, for it is always what he made it. It is true workmen in brickyards are not angels, but in the hereafter I imagine some of them will be entitled to as large wings and as fine a harp as their employers. (Applause.)

THE MANAGEMENT OF MEN—GENERAL DISCUSSION.

Mr. Pike: While I agree with the writer of the paper on some points, I take issue with him on others. I believe that the proper way to manage men is to manifest an interest in their affairs, sympathize with them and cultivate an intimate relation; figuratively speaking, I think we ought to sleep with our men. The one most important thing is to pay wages promptly. Whatever else we do we ought to pay our employes regularly, but we ought not to stop there, we should take a real interest in their welfare; in fact, do unto them as we would have them do unto us.

Mr. Denison: I think it is wise to show proper interest in the welfare of our employes, but I think it is mistake to become too familiar with them. Many a good man is spoiled in that way. Kindly, considerate treatment is due every man, but undue intimacy ofttimes leads to carelessness and inefficiency.

Mr. Smith: One of the greatest troubles we have to contend with so far as our men are concerned is intemperance. If anyone can suggest a remedy for this trouble, or suggest a means by which we can prevent our men from indulging in the liquor habit, he will put me under a lasting obligation. Our men are not drunkards, but there is a tendency to "tank up," as the boys call it, which frequently incapacitates them for their duties. Some may say, "Discharge the drinkers." But this won't do, for some of them are trained men, and we cannot fill their places at a moment's notice, and so we have to put up with their occasional off days, but it is a source of no little annoyance.

Mr. Stoll: I believe the proper thing for Mr. Smith to do is to fire the men who drink. I have no patience with drunkenness, and would not have a man in my employ who would get drunk.

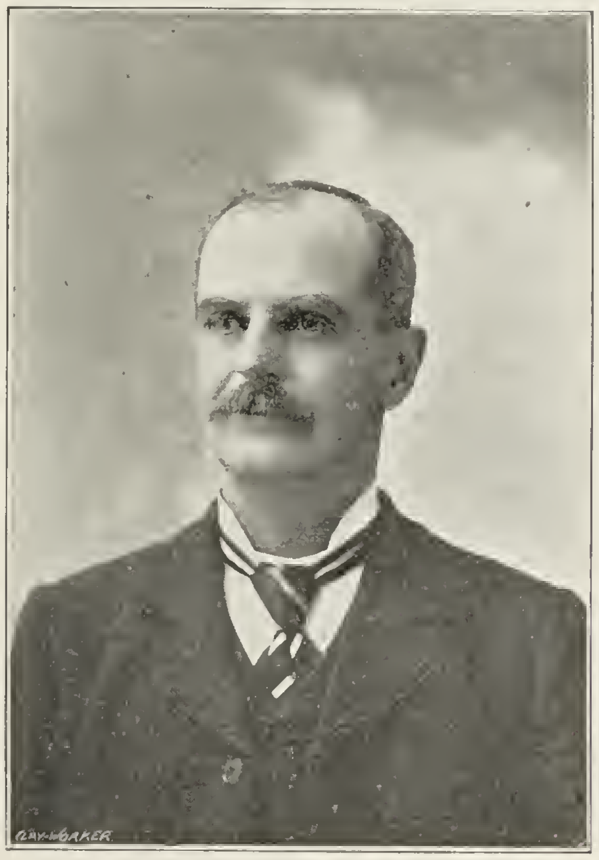
Mr. Sutton: I agree with Mr. Stoll in part. It is a well-known rule with us, and our workmen understand it, that if any of them absent themselves from their work they are dismissed at once, and if we take them back at all they start at the bottom of the ladder. In this way, if a good man goes wrong, we don't really lose him, but he pays a penalty for his offense that makes him hesitate to repeat it.

President Holman: There are no further papers to be read, so we will now hear from Mr. O. T. Denison, chairman of the Committee on Resolutions.

Mr. Denison: Mr. President and gentlemen of the Convention, your Committee on Resolutions beg leave to submit the following:

REPORT OF COMMITTEE ON RESOLUTIONS.

Resolved: That we respectfully urge upon the director of the United States Experiment Station, located at Ames, Ia., and upon the board of trustees of the Iowa Industrial and Agricultural College, also located at Ames, Ia., that they arrange for and carry on experiments, analyses and tests of the clay and shales of Iowa and the products thereof, in furtherance of the development of the clay industries, as it is contemplated by the acts of Congress and of the Iowa Legislature providing for the maintenance of the said experiment station and industrial college.



O. T. Denison, President-Elect, Mason City, Ia.

Second: That a committee of three members be appointed by this Convention to represent this body to confer with the management of said experiment station and industrial college, and to present for investigation, analysis and test such subjects as may be suggested by the members of this Association, or as may in the judgment of said committee best advance the clay industries of Iowa.

Third: That we recognize and appreciate the thorough and valuable work done by the Iowa Geological Survey in aid of the development of the clay, coal and other mineral resources of Iowa; and that we respectfully ask the Legislature of Iowa to continue the appropriations for said survey until its thorough work is completed over all the State.

Fourth: That our cordial thanks are extended to the retiring officers of this Association for their untiring labors the past year, which have resulted in making this meeting so helpful, pleasant and valuable to all who have been present.

Fifth: That we extend to his Honor, Major Quick, to the local brickmakers, to the Euclid Club and the local associations, to the management of the Mondamin Hotel, and to the local press and the clay journals, our sincere thanks and assurances of our appreciation of the warm welcome and cordial hospitality extended to us during our stay in Sioux City.

Sioux City, Ia., March 2, 1899.
O. T. DENISON, Mason City, Ia.
Committee. J. B. McHOSE, Boone, Ia.,
W. S. SUTTON, Table Rock, Neb.,

On motion of Mr. Stephenson, seconded by Mr. Corneer and others, the resolutions were unanimously adopted.

President Holman: The next in order is the report of the Secretary.

Secretary Goodwin made a statement of the receipts and disbursements for the year, showing a satisfactory balance in the treasury, the list of members showing a slight increase in the number in attendance over the previous Convention.

ELECTION OF OFFICERS.

The election of officers of the Iowa Association resulted as follows:

President, O. T. Denison, Mason City.
Vice President, D. W. Townsend, Cherokee.
Treasurer, F. A. Stephenson, Webster City.
Secretary, Robert Goodwin, Redfield.

Each of the officers was called on for a speech, and each in turn thanked the members of the Association for the honor paid him, promising to use his best efforts to advance the interests of the Association.

J. B. McHose, Boone, Ia.

President-elect Denison, on taking the chair, said he had been instructed on leaving home to invite the Association to hold its next Convention in Mason City by a committee of citizens whose duty it would be to see to it that if the invitation was accepted that those who came to the next Convention would be properly entertained. That while Mason City was not a metropolis, her people were enterprising and hospitable, and were earnest and sincere in their wish that the Convention might be held in their city. The citizens' committee now had in its treasury a sufficient sum to defray all necessary expenses, and he believed he was safe in guaranteeing every member of the Convention who would come to Mason City a pleasant time.

Vice President Townsend said he was not to be outdone by his superior officer; that Cherokee, where he resided, was a very prosperous and populous city; that they had some extensive public buildings that he was sure the members would find interesting (refering to the State penitentiary), and that he hoped that his invitation would be given favorable consideration.

A vote of thanks was tendered to each gentleman and their respective cities for the invitations, and the matter left in the hands of the Executive Committee. It was generally understood, however, that the next convention would be held in Mason City.

The Iowa Convention was then declared adjourned.

President Smith again took the chair, and the Nebraska Association proceeded to elect officers.

On motion of Mr. Sutton, seconded by Mr. Corneer, the rules were suspended, and by unanimous ballot the present incumbents were all declared re-elected for the ensuing year. The officers of the Nebraska Association are as follows:

President, J. Fred Smith, Omaha.
First Vice President, J. L. Edelmaier, Hooper.
Second Vice President, H. H. Horrom, Auburn.
Treasurer, J. E. Stockwell, Lincoln.
Secretary, W. H. Bushell, David City.

President Smith said that both personally and on behalf of the members of the Nebraska Association he desired to thank the officers of the Iowa Association, the mayor and other representatives of Sioux City, and particularly her brickmakers, for the very kind and pleasant entertainment they had afforded the visitors, saying he and his associates had enjoyed the Convention exceedingly, and that he sincerely hoped other joint conventions might be held in the future, and that he and his associates would like to have the next one held on the Nebraska side of the river, in order that Nebraskans might in part repay their neighbors for the many courtesies shown them.

The Conventions was then declared adjourned sine die.

THE BANQUET.

Sioux City Braves Proves Themselves Royal Entertainers. A Very Happy Occasion.

THE LOCAL BRICKMAKERS covered themselves and Sioux City all over with glory by the excellent banquet tendered to visiting clayworkers Wednesday night.

The pleasant dining room of the Mondamin was especially decorated for the occasion, and presented a very attractive appearance as the guests filed in at 9 o'clock, not the least pleasing feature of the picture being the neatly be-aproned young lady waitresses, who seemed to move in unison with the music. The eatables and drinkables were all the more palatable for being served by dainty maids, so much so that some of the elderly members mentioned it in their toasts as among the special joys of the occasion. There was all kinds of music, instrumental, vocal and chin, all of excellent quality. The air was redolent with melody and good cheer.

The following menu was well served:

Oyster Soup. Radishes. Celery.
Fried White Fish, Tartar Sauce. Shoestring Potatoes.
Larded Filiet of Beef. Mushrooms. Walnut Corn.
Sweet Potatoes. Hot Rolls. Claret Punch
Fresh Lobster Salad. Olives. Wafers.
Cherry Ice Cream. Fancy Cake. Coffee.

After the final course was disposed of cigars were passed, and President Holman started the speech making by telling the visitors how pleased the local committee was over the success of the Convention. He said that while the balance of the assembly were enjoying the occasion at its face value it was to him an especially happy event, for he was celebrating his fifty-ninth birthday. This announcement was greeted with a round of applause that evinced the wish that he might enjoy many happy returns. He then introduced the Hon. C. R. Marks, of Sioux City, as master of ceremonies for the evening.

Toastmaster Marks, though secretary of the Sioux City Brick and Tile Works, is a lawyer by profession, and displayed marked ability as an extemporaneous speaker. He welcomed the guests in a very cordial way, and assured them that the occasion was as enjoyable to himself and his fellow-townsmen as to the visitors, for Sioux City always took delight in welcoming and entertaining gentlemen from other cities. He closed by directing attention to the fact that Mayor Quick was present, and called on him to tell what he knew about a specie of brickmaking, of which little was known to the balance of the audience, but which he thought the mayor knew all about, namely the "gold brick scheme."

Mayor Quick is true to his name. There is nothing slow about him. He had made a very favorable impression in his address of welcome at the morning session, and was greeted with a storm of applause. He again gave the city to the visitors, and explained the toastmaster's reference by saying his only experience in the gold brick business was in connection with an unsuccessful effort to capture some smooth gentlemen (?) from Nebraska who attempted to separate some Sioux City capitalists from their money. One of the gold bricks was now in his possession, he said, but he did not acquire it by purchase.

J. Fred Smith, of Omaha, President of the Nebraska Association, was the next speaker. He said the occasion was one he would long remember pleasantly; that while he was not as lucky as President Holman, in that the latter was able to combine a convention and birthday celebration, he was enjoying himself as much as if he was President Holman's twin brother; in fact, he did sustain that relation in his official connection with the Convention; that he had often wished he had been born twins, so he might have doubled his pleasures, and was glad to realize his wish to this extent. He told of the good time he had had at the National Convention at Columbus, and advised those who had never attended the National Conventions to do so next year, assuring them that they would find the time and money well spent. To him the meeting of so many fellow-brickmakers was an inspiration and a real help in the following year's work. He closed with an expression of gratitude for the pleasure and entertainment afforded by the braves of Sioux City, and invited all who could to meet with the Nebraska Association a year hence.

Toastmaster Marks, with facetious introductory remarks, called on Mr. E. M. Pike, of Chenoa, Ill.; Rev. E. H. Holman, Sergeants Bluff, Ia.; William Sutton, Table Rock, Neb.; J. B. McHose, Boone, Ia.; T. A. Randall, Indianapolis; G. C. Stoll, Wheaton, Ill.; D. W. Townsend, Cherokee, Ia. Each gentleman responded in an appropriate manner, the speeches being interlarded with songs by a very clever quartet of local singers. The event passed off in a very charming manner, and many were the compliments paid those who had planned and carried out the evening's programme.

LIST OF MEMBERS OF THE IOWA AND NEBRASKA BRICK AND TILE MANUFACTURERS' ASSOCIATION.

Carl Nies, Burlington, Ia.
D. W. Townsend, Cherokee, Ia.
W. B. Lower, Sioux City, Ia.
C. J. Holman, Sergeant Bluff, Ia.
E. M. Pike, Chenoa, Ills.
T. A. Randall & Co., Indianapolis, Ind.
F. Lehman, Chicago, Ill.
O. T. Denison, Mason City, Ia.
J. Moroney, Chicago, Ill.
George H. Hartwell, Chicago, Ill.
Charles Dion, St. Paul, Minn.
Thomas Green, Sioux City, Ia.
E. M. Freese & Co., Galion, O.
American Clayworking Machinery Co., Bucyrus, O.
C. B. Platt, Van Meter, Ia.
A. M. Holman, Sergeant Bluff, Ia.
F. A. Stephens, Webster City, Ia.
J. B. McHose, Boone, Ia.
W. C. Vanneman, Anderson, Ind.
S. C. Johnson, Fort Dodge, Ia.
F. M. Utzgibons, Sioux City, Ia.
Mr. Morris, Des Moines, Ia.
Robert Goodwin, jr., Redfield, Ia.
F. E. Swift, Washington, Ia.
C. Nelson, Sioux City, Ia.
M. L. Flinn, Sioux City, Ia.
C. P. O'Neill, Carroll, Ia.
M. Patterson, Sioux City, Ia.
Iowa Paving Brick Co., Des Moines, Ia.
L. C. Beasley, Council Bluffs, Ia.
J. Fred Smith, Omaha, Neb.
William Sutton, Table Rock, Neb.
C. F. Kaul, Madison, Neb.
John Sherbaha, Wayne, Neb.
Corneer Bros., Omaha, Neb.
J. Fred Smith, president, Omaha, Neb.
John Edlemair, first vice president, Hooper, Neb.
W. H. Horrum, second vice president, Auburn, Neb.
J. E. Stockwell, treasurer, Lincoln, Neb.
W. H. Bushell, secretary, David City, Neb.
George F. Cotton, Table Rock, Neb.
M. N. Fellows, Table Rock, Neb.
L. K. Homes, Lincoln, Neb.
P. H. Jungbludt, Arlington, Neb.
J. A. Buckstaff, Lincoln, Neb.
N. W. Survon, Beemer, Neb.
West Point Milling Co., West Point, Neb.
D. Guthrie, Superior, Neb.
Withnell Bros. & Smith, Omaha, Neb.
Herman Gererke, Norfolk, Neb.

Toastmaster C. R. Marks, Sioux City.

N. L. Houghtelin, Fairbury, Neb.
Albert Edlemair, Scribner, Neb.
William Sutton, Table Rock, Neb.
P. Simson, St. Edwards, Neb.

THE TRIP TO THE BRICKYARDS.

A Feature not on the Programme, but One Thoroughly Enjoyed by the Visitors.

THURSDAY AFTERNOON was given up to a brickyard pilgrimage. At 2 o'clock the delegates boarded a large special trolley car, and were whisked out over the hills at a swift gait to the plant of the Lower Brick Co., about four miles out. The ride was a pleasant one, and gave the visitors a better idea of the situation and surroundings of the city than they could otherwise have obtained.

Arriving at the plant, stalwart W. B. Lower, the secretary and manager of the company, who had made his presence felt on the trip out by persistently passing a box of good cigars, took the lead, and marched the party through the works, which were established in 1890 by that gentleman, who is a typical Westerner and a good brickmaker. A giant in stature, large in head and heart, with good executive ability, such as is required to make and market 50,000 brick a day. The plant had been shut down some time, but the visitors were well paid for their trip, for they were enabled to thoroughly inspect the continuous kilns—a treat to those not familiar with them.

The plant is equipped with a Chambers machine, which was put in in 1892, and with which they make 50,000 common building brick a day. The clay is pulverized in dry pans. The brick are dried in a Starkey steam heated tuunel dryer. The tunnels, there are twelve of them, are 100 feet long, and the steam pipes run the full length of the tunnel. There is a flue running beneath the center of each tunnel, with 8x10 inch openings at intervals so that when the tunnels are filled there is one of these openings beneath each car. The warm, dry air is carried down through the brick, gathers its burden of moisture, and is drawn down into the flue beneath. Each tunnel holds six thousand brick, which are dried bone dry in twenty-four hours. Mr. Lower considers the system very economical and satisfactory. From the dryer the brick go to the kilns, of which they have two of the continuous order, and one round down-draft Holman kiln. The latter has a capacity of 75,000 It has been used a long time, but is still in excellent condition. Mr. Pike and others who are considered authorities commended it, which Mr. Holman took as a compliment, both to his plan of kiln and his fire brick, which were used in constructing the floor and bag walls. The two continuous kilns have been in use several years. The Hoffman kiln, particularly, was the worse for wear, and workmen were busy rebuilding portions of the walls and arches. The Wolfe kiln has recently been overhauled and equipped for burning oil after plans furnished by Mr. Lehman, of Chicago. Mr. Lower expressed himself as well pleased with the results, as well he might be, judging from a chamber which was being emptied, the brick being nearly all hard burned from top to bottom. The brick were being piled on the yard, where there were more than three million ready for delivery. Mr. Lower said he wished he had a couple million more, as he anticipated a very large demand with the advent of spring. Brick are now selling at $6.50, with the likelihood of a slight increase. Their brick are all shipped by rail, the plant being located on the Chicago, Milwaukee & St. Paul Railway, with two side tracks running into the yard.

Thomas Green, Sioux City.

A NEW PAVING BRICK PLANT.

A short distance from the building brick plant is the works of what was formerly known as the Sioux City Sewer Pipe Co., but which will henceforth bear the name of the Sioux City Paving Brick Co. The entire equipment, including several acres of valuable clay land, having been purchased by Mr. Lower and his associates some months since. The works will be overhauled and equipped for the manufacture of paving brick, the necessary machinery having already been purchased from the American Clayworking Machinery Co., and includes a No. 1 Giant brick machine, a 14-foot pugmill, an Eagle repress, and other supplies to enable them to make 30,000 brick a day, a large per cent. of which will be repressed. Both plants are well located, each having an inexhaustible supply of shale and fire clay. At the building brick plant they are now working a bank of clay 75 feet in height. It is all good workable material from top to bottom. They have drilled to a depth of 270 feet through the same character of material, so that the process of manufacturing can go on for generations to come, so far as the supply of raw material is concerned.

THE EDITOR OF THE CLAY-WORKER PRESENTED WITH A PEACE PIPE.

Again boarding the trolley car, which was in waiting, the party speeded back toward the city. En route a very pleasant surprise was sprung on Mr. Randall, who was presented with a handsome Indian peace pipe, the gift of Mr. Lower, who had himself obtained it from the Indians several years before. Mr. Marks, who served so well as toastmaster on the preceding evening, made a neat presentation speech, explaining that the pipe was made from what is known in that section as Indian pipe clay, a vein of which is found some miles to the north. There is underlying the ordinary clay a stratum about six inches in depth of this dark blood red clay, which, when first taken from the bank, is soft enough to be easily cut with a knife, but which when exposed to the atmosphere becomes as hard as stone. There is a legend that the color of the clay is due to a tragedy involving the death of a beautiful Indian maiden who was slain by a jealous lover, and her blood staining for all ages the clay at the particular point where the tragedy occurred. Be this as it may, the Indians have for years sought this particular clay from which to make their peace pipes. The one given to Mr. Randall is in the form of a tomahawk, the thick part serving as a bowl, the stem is made in a separate peace and joined to the bowl by a piece of hollow wood. Both are prettily carved, showing that the Indian is not without artistic instinct.

AT THE PLANT OF THE SIOUX CITY BRICK AND TILE WORKS.

Returning to the city the party was transferred to a car on another line running in an opposite direction, and made a quick trip to the works of the Sioux City Brick and Tile Co. Both Mr. Marks, who is secretary of the company, and Mr. Thomas Green, manager and treasurer, escorted the party through the plant, which is equipped with a Kells machine which was installed ten years ago and is still doing good service. From the machine the brick go to a Chicago iron clad dryer, which Mr. Green commends, notwithstanding the fact that their clay is so tender that special precautions have to be taken to prevent its cracking in drying. From the dryer the brick go to continuous kilns. They have one Hoffman which was built in 1888, and a Radford which was built some years later. Both have been modified somewhat by Mr. Green, who is an old-time brickmaker and thoroughly understands every detail of the work. He has made openings in the walls so as to enable him to fire from the sides as well as from the top, which he finds a decided advantage. Like Mr. Lower he was very popular with the smokers. In fact, the supply of cigars was greater than the demand. They make building brick only, turning out about a million a month, a small per cent. of which are repressed.

Like their neighbor they have an inexhaustible supply of good clay, and are making a good grade of common building brick. After going all through the plant the parties were trollied back to the hotel, a jolly and contented lot of good fellows, who, in years to come, will sing the praises of Sioux City and her hospitable brickmakers.

WITH THE MILWAUKEE BRICKMAKERS.

MILWAUKEE BRICK are up to $7 a thousand, and the local market is in control of what is officially known as the Lincoln Avenue Brick Company, an organization now referred to in the Milwaukee papers as the local brick trust. The articles of incorporation filed yesterday give the names of Charles F. Burnham, John O. Burnham and Henry Herman. The company is nominally capitalized at $30,000, divided into 600 shares of $50 each. The object given is "the manufacturing, buying, selling and dealing in stone, brick, lime, clay and stone, brick, lime and clay products."

A further move by the same incorporators is the formation of the Milwaukee Building Supply Company, nominally capitalized at $5,000, divided into 5,000 shares. The objects given are the same as in the case of the other company, but it is claimed that it will merely serve as the other's agent, as well as the agent of other brick producers who may desire to supply their brick to the public through a central office.

The new organization seems to have complete control of the local field. While it has not bought any yards outright, it has leased a large number of them and will probably follow trust tactics in regulating the manufacture and sale of the product locally. Some yards will be shut down and others run to full capacity, and probably enlarged. The yards leased are said to be those of the Chase Brick Company, the Cream City Brick Company, the two Burnham yards, the Milwaukee Brick Company, the Standard Brick Company, the Chas. E. Kraatz Company and the M. Davelaar & Sons. There is a necessity for closing down some of these yards, it is claimed, owing to an overproduction of brick the past few years. The yearly brick output of the city yards is about 160,000,000. At times brick have sold as low as $3 a thousand, and there has only been a sale for about half the output.

A local brick dealer says the combination has been formed for self-protection, and that it has been necessary, as the local yards have lost $180,000 since the old organization of brick concerns went to pieces some two years ago. It was supposed by the public that the old organization had been resuscitated some six months ago, but this was not so, strictly speaking, and it became necessary to lease the surplus yards and close them up. Under the new arrangement the local makers will not invade outside fields; they will not be allowed, for instance, to send brick to Watertown, Wis., or to Chicago. There is a good deal of building locally, both already begun and prospective, and it remains to be seen what effect the raise in the price of brick will have on the builders.

Following close on the heels of the Milwaukee combine comes news of a similar consolidation of the brickmakers of the Fox River Valley, in this State. The incorporation papers have just been filed at the Outagamie courthouse, at Appleton. The combine will be known as the Fox River Brick and Tile Company, its principal office being located in the city of Appleton. It is capitalized at $200,000, and the incorporators are August Knoeppel, William H. Carter, Charles H. Vinal and John Hackworthy. The company is authorized to manufacture and deal in stone, brick, lime, sand, clay tile and other building materials, and in fuel as well, in addition to controlling the brickyards of the entire valley.

Charles H. Vinal, one of the incorporators, says all the yards of Neenah, Menasha, Appleton, Kaukauna, DePere, Green Bay and Duck Creek, fifteen in all, are members of the new combine. Some of these yards will be shut down so as to get the output down to the demand for brick. This has been rendered necessary, as much of the brick at the yards has been manufactured in the past at a loss. The manufacturing will be carried on where it can be done the cheapest and easiest supplied to the users. So far the prices have not been raised, and Mr. Vinal thought that they would remain as they were for some time to come.

A. B. C.

Milwaukee, March 12, 1899.

AN EVENING WITH MR. HOLMAN.

It was our good fortune to spend Thursday evening following the Iowa Convention with President Holman at his home in Sergeant Bluff, a pretty little hamlet seven miles from Sioux City. It is virtually a suburb of the city, and will be a part of the town itself ere long, if the city grows as rapidly as present conditions indicate.

Mr. Holman is one of the pioneers in that section, his parents having journeyed there from New England, traveling by the overland route in wagons when he was still but a lad. It is not surprising, therefore, that he is now the possessor of many broad acres—so many, indeed, that, standing on the threshold of his home and looking to the west, his eyes cannot see the boundary line between his and his neighbor's fields.

In his younger days Mr. Holman was a stock farmer. Needing some brick for foundation purposes he employed an itinerant brick burner to make a few thousand. Learning of this, the railroad prevailed on him to take an order for a few thousand for their use. He found he had good clay in abundance, but the brickmaker was not equal to the occasion, so he took up the work himself, and soon blossomed out a fullfledged brickmaker. His Yankee proclivities led him to seek mechanical appliances, and in a short time he had acquired what was then a novelty—a machine brick plant.

C. J. Holman's Clay Bank, Sergeant Bluff, Ia.

Being progressive as well as industrious he subscribed for the CLAY-WORKER, answered the original call and became a charter member of the N. B. M. A., attending the first convention at Cincinnati in 1886, and has been an earnest, active member of that organization ever since. It, therefore, goes without saying that he has an up-to-date brick plant, one feature of which many a brickmaker may well envy, namely, his clay bank. It is worked from several different levels, aggregating about 150 feet in depth. As there are several acres in the tract, his children's children may continue the business of brickmaking where he has started, if they see fit. He not only has an abundance of good brick clay, but an excellent quality of potter's clay and also a vein of good fire clay.

The brick plant is well arranged and equipped with a Frey-Sheckler dry pan, Chambers machine, Raymond repress, two steam-heated dry floors, and a dozen or more round down-draft kilns of his own designing. The plant was not in operation at the time of our visit, but will be started full handed as soon as the weather will justify.

Unlike some brick men, Mr. Holman lives in a brick house, made of material from his own kilns. It is a pleasant, palatial and substantial home, and those who pass within its portals are impressed not alone with its comforts, but by that warmth of hospitality which makes inviting the humblest cottage.

MISSOURI CLAYS AND CLAYWORKERS.

St. Louis Among the Chief Clay Centers of the World.

As a CLAY PRODUCING center St. Louis is not excelled by any locality in the United States. Nature has been lavish with her gifts in this direction and Missouri, as a whole, is queen. Within her borders is found all kinds and varieties—kaolins, ball clays, fire clays of various kinds, and last, but not least, the celebrated red clay of St. Louis. All are found in abundance within a radius of fifty miles of this city. Anything that is made of clay can be produced here, with proper men and appliances.

There is now being shipped from St. Louis a bond clay, which comes from Jefferson City, and is used in the potteries of East Liverpool and other points in Ohio, made into tableware, electric insulators, sanitary and other white clay goods, shipped back, sold and distributed from St. Louis.

The manufacture of white ware requires a particular class of skilled labor, without which it would be useless to engage capital, but the time will come when St. Louis and the tributary territory will be supplied with this ware from our home market.

The fire clay industries are among the largest and best equipped of any in the country, the total capacity of which would approximate 700 tons daily and 85 per cent. is produced for shipment. This would load thirty-seven freight cars of fifteen tons capacity per day.

St. Louis can claim the credit of first making the largest sewer pipe ever manufactured for commercial purposes, 36 inches inside diameter and each piece weighing 1,070 pounds when burned. The names of the various articles produced by the fire clay manufacturers of this city are legion.

In addition to fire brick and sewer pipe, there are articles which the ordinary man never dreamed of, such as laundry tubs; acid vats; sizers for refining works, shipped to Colorado; car heaters, locomotive arch blocks, used by many of the largest and best railroad systems of the country, viz.: the C., B. & Q., Wabash, Missouri Pacific and others, all made and shipped from St. Louis; gas retorts, sent to the numerous gas works all over the United States; zinc furnace blocks; cupola blocks, for foundry purposes; bakers' tile, boiler tile, grate settings, lime kiln blocks, chimney pots, flue linings, wall coping, tile of all shapes and sizes. Then there are also large shipments of clays—raw clay as it comes from the mine goes as far East as Pittsburg, washed clay sent into New York and New Jersey, calcined clay to all zinc smelters, glass pot clay to numerous glass works East and West. Fire brick of various qualities is shipped to the cold iron regions of northern Wisconsin and down into the southern land of Mexico.

Cuba will now be open to us if satisfactory rates of freight are put in effect, and St. Louis should have that trade.

Ornamental terra cotta is now becoming a feature of the clay products of St. Louis, and was not considered in the daily tonnage output of clay products estimated above. This is the high art feature of the present outside decoration of our office buildings and finer class of residences. When once embodied in the structure, it will be there as long as time lasts. Iron will rust, stone will disintegrate and wood will decay, but terra cotta will never change. The broiling hot sun of summer or the freezing cold blasts of winter will have no effect on this indestructible material.

The brick industries of St. Louis are among the largest, if not the largest of their class in the world, and shipments are made to all parts of the United States. No distance is too great and no freight rate is too high to keep some admirer of St. Louis brick from using them.

Seventy-four per cent. of the face brick used in Chicago comes from St. Louis. New York and Brooklyn boast of some of their finest buildings and residences built of St. Louis pressed brick. Seattle, Tacoma, Spokane Falls and Snohomish, in the State of Washington, have numerous fine buildings in which St. Louis brick were used.

The Northern cities of Winipeg, Duluth, Minneapolis and St. Paul use them, and the progressive New South, not to be outdone, have many representative buildings in Atlanta, Mobile, New Orleans, Houston and Galveston, whose exteriors are beautified by a St. Louis product.

The "Year Book" of 1883 gives a tabulated statement of investments in the fire clay industries of St. Louis as $1,500,000, and the annual product $2,500,000. It is safe to assume that these amounts have been doubled, and when the terra cotta and building brick output is added, it brings the actual investments up to nearly $5,000,000, which, of course, includes the value of the land occupied and used by the various plants.

The value of the output has more than doubled in fifteen years and bids fair to increase, owing to the prevailing tendency of larger capacities with smaller margins.

It would be hardly fair to close this article without reference to some of the men and firms carrying on this extensive trade which supports thousands of people, and whose semi-monthly pay rolls bring food and happiness to many a household.

They were all, without exception, started with very little capital. Early conditions were favorable to their growth, as fire clay was a scarce commodity west of Ohio fifteen years ago. It required both pluck and energy to carry the trade to its present vast volume.

Among the largest may be mentioned the Laclede Fire Brick Co., started in 1865 by the present President, Mr. James Green; Evens & Howard Fire Brick Co., before incorporation known as Evens & Howard, started in 1857; Hydraulic Press Brick Co., organized in 1864, capital stock $100,000., present capital $3,000,000; Christy Fire Brick Co., organized by Wm. T. Christy; Blackmer & Post Sewer Pipe Co., organized about 1882 by Messrs Blackmer and Post; Mitchell Fire Clay Co., one of the oldest; Winkle Terra Cotta Co., started by Mr. Joseph Winkle in 1883, in a wooden shed about 16x30 feet, and is now one of the largest terra cotta plants in the country.

No idea can be formed of the magnitude of the majority of these plants without a personal inspection, which would be a lesson not only to strangers, but to some of the oldest inhabitants.—T. P. Plumridge, in the Manufacturer.

DOWN IN JERSEY.

The CLAY INDUSTRIES are all booming here in the East. The factories are shipping as fast as possible. The Raritan river is now open, and many schooners are going out every day with building material for New York city. The M. D. Valentine Bro. & Co. factory at Woodbridge had a small strike during the week, but it is running again now. The C. Pardee works have an immense stock of hollow brick ready to be forwarded as soon as needed. In passing through this plant a few days since we were immediately struck with the neatness of the yard. In years past this same yard has been in charge of many different superintendents. But we could easily note the difference, and as our old friend, Larry Brown, from the Perth Amboy Terra Cotta Works, is now in charge at Pardee's, it is easily explained. We must say it gives a vast difference to the looks of a hollow-brick yard when every pile is straight and true.

At the Standard Fireproofing Company's plant, farther up the river, they are as busy as they can be, turning out vast quantities of vitrified conduits for electric wires. These are made with one, two, three, four, six, nine and sixteen-inch holes, and from two to four feet in length. The mode of making these conduits is a very interesting one, and we will try to explain in a future letter. All the older kilns in this plant are now being overhauled and a new bottom put in place especially for burning these conduits. All the material, from press to kilns, is handled on four-wheeled spring trucks, and kilns are emptied on trucks hauled mainly into the yard by horses. Two men with one of these trucks can handle more than could be piled on four barrows. Much labor is thus saved. Very little escapes the vigilant eye of Robert Lyle, the manager, and if there is likely to be any vacant drying space over night the orders go out to run at night until said space is filled.

The Raritan Hollow and Porous Brick Company, next above, is also keeping the wheels going, as usual. The late blizzard was a drawback as to getting clay in via rail, but in a few days the locomotives managed to back the snow off. At the last named plant we note an improvement in their enameled brick department. A large building, formerly used as a barn for their many horses, is being added to the enameled branch in order to give more room.

The Perth Amboy Terra Cotta Works are now working busily on quite a large job for New York city, making both brick and terra cotta for the same. The Standard Terra Cotta Company is also doing nicely.

M. A. Edgar, of South River, is shipping from seventy-five to one hundred tons of clay per day to the Standard Fireproofing Company. This clay has been coming via rail, over the Raritan River Railroad and Central Railroad of New Jersey, but now that the river is open we suppose it will come by water.

The longer we live in New Jersey and the more wells we drill the more astonished we are at the vast resources of this State in clays and sands. There is practically no limit to the quality or quantity of either. This should be a banner year in the clay industry.

The new copper refinery at Perth Amboy has used vast quantities of brick in its many buildings, probably a couple of million or more. W. R. O.

Perth Amboy, N. J.

PACIFIC COAST NEWS.

IN CALIFORNIA at the present time the most interesting subject is the crop prospects. In some sections of the State the outlook for any kind of a crop is poor, and, if rain does not come very soon, it will mean a setback for both the farmers and merchants who are unfortunate enough to be located in these unfavored sections.

This, of course, affects all lines of industry, and in a measure stops progress. But there is always a bright side as well as a dark one, and, while one part of the State may suffer, the other prospers, and in California this is generally the rule. In the northern section and throughout Oregon and Washington and Arizona the outlook is good. Large enterprises are under way, buildings are to be constructed and great prosperity is assured, and the clay industry will come in for its fair share.

New discoveries of clay suitable for fine brick are constantly being made in different places on the coast. New kilns are being erected, and the brick industry continues and will continue to grow. The local San Francisco trade is dull, as usual, but there are indications of an improvement. Quite a large lot of sewer pipe was ordered by the government for Manila, and it is hoped that this will be followed by larger orders from there. There should be a large demand for brick, terra cotta and sewer pipe in the Hawaiian islands, as great improvements are expected to be made there in the way of buildings and sanitary work. The present outlook for the clay industry is more encouraging than it has been for sometime.

N. Clark & Sons, San Francisco, report local business quiet. The sewer pipe trade is fairly brisk with this firm.

Bert Grates contemplates starting a brickyard in or near San Pedro, Cal.

The Newberg Pressed Brick Co., of Newberg, Ore., has received a fine diploma from the Omaha Exposition for a display of pressed brick sent there last year.

J. F. Volkham and Fred Joehncks have started a brickyard at Oxnard, Cal. The material for making the brick is obtained near the yard, and, if the weather is favorable, the brick will be on the market in about five weeks. The first kiln will contain about 130,000 brick.

The West Kootenay Brick and Lime Co., limited, has been incorporated, with a capital stock of $50,000. The head offices are at Nelson, B. C.

A brickyard is to be established at Fullerton, Cal. It will be supplied with modern machinery, and will be operated by James Cardiff.

The brickyards at Butte, Mont., including the pressed and fire brick departments of the Anaconda Copper Mining Co., have closed down for the remainder of the winter. The shutdown is said to be due to the fact that enough brick of all kinds have been manufactured to supply the demand for sometime to come. It was recently reported that the brickyards would be moved from the present location this spring, and the yards may be closed down for this purpose.

A pressed brick and terra cotta manufactory is to be established at Pacheco Landing, near Martinez, Cal. The soil there is excellent for such an industry.

A deposit of kaolin is reported to have been discovered near Gladstone, Clackamas county, Oregon. It is of a lustrous, grayish appearance, and has a soft, oily feeling. When burned it is said to turn white in color.

Slater Bros. are preparing to begin the manufacture of brick this spring at Lehi Junction, Utah.

William Ruby and Harry Copner are arranging to start a brick kiln near Albuquerque, N. M. SUNSET.

A BUSY FIRM.

From all quarters come reports of busy times. W. R. Cunningham, secretary of the Wallace Manufacturing Co., Frankfort, Ind., writes that they are fairly overwhelmed with orders for Wonder machinery, clay crushers, pug mills, etc. The first of the year they had eight Wonder machines in their factory ready for shipment, with a good supply of automatic cutting tables, pug mills, etc. These have all been sold, and they are now working to their fullest capacity, and are still unable to meet the demand for immediate shipment. Mr. Cunningham thinks this record is an exceptionally good one, considering the fact that they "have only one man on the road to bore brickmakers." He adds that there are two things of which he is proud—one, the success of the "Wonder" machines (with but one or two exceptions every machine sent out since 1890 is now in successful operation); the other, that while it is sometimes hard to get a new customer they seldom or never lose an old one.

A "MONARCH" MEMORY.

The accompanying illustration will of itself revive pleasant memories of Columbus and the recent N. B. M. A. Convention in the minds of all those who were in attendance, for surely no visitor failed to observe the unique display made by the Wellington Machine Co. No feature of the "annex" or exhibition room was more noticeable. The word "Monarch" was formed in huge letters on the wall by pasting together a lot of testimonial letters received by the Wellington Machine Co. from users of the "Monarch," each singing the praises of that machine. There were from fifty to sixty of these letters, each one bearing the individuality of the writer. As a whole they presented a formidable array of testimony in favor of the "Monarch." A cut of the machine itself may be seen by turning to page 287.

A NEW HAND-POWER PRESS.

THE ATTENTION of our readers is called to this new hand-power ornamental press for making brick from dry clay. This press was invented by Mr. W. P. Grath, Secretary of the Illinois Supply and Construction Co., and is very simple in construction, and from the fact that it has tremendous leverage power combined with an improved toggle movement it will exert a great pressure on the clay, and will turn out brick equal in hardness to any that can be made by either steam or hydraulic power. This press gives the clay a triple pressure. The initial pressure is given by the top plunger, which sinks into the mold, which is filled with clay, to a depth of one inch before the final and great compression takes place, which is a double pressure of both top and bottom plungers, which finishes the pressing of the brick. The large lever is then raised, the upper plunger thrown back, and the secondary lever on the left side of the press is then brought into play, which raises the brick out of the mold, and the lower plunger is then allowed to drop, so that the mold can be refilled with clay. Great durability is also claimed for this press. Further particulars can be obtained by addressing the Illinois Supply and Construction Co., of St. Louis, Mo., whose ad. appears on page 310.

The Phoenix Iron Works, Port Huron, Mich., advise us that a new brick plant will be established at that point in the near future.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Paving Problems.

Editor CLAY-WORKER:

Here in central Jersey a goodly number of our good citizens are much exercised over the proposed paving of Highland Park Hill, a popular driveway with an unusually steep hill leading to the bridge that spans the Raritan river at New Brunswick. The rise is possibly thirty-five feet in 150 feet. It was intended to pave this driveway with brick, but some 213 property holders have protested, so the result is now in doubt. Some time ago a similar hill in this vicinity was paved with asphalt and has proven a source of no little discomfort and danger to those using it as a driveway. Owing to the steep grade and the slipperiness of the pavement, horses with difficulty keep their footing. They slip and fall frequently, occasionally receiving such injuries as to disable them, indeed, in a number of cases valuable driving horses were so badly hurt as to necessitate their being killed. Those who have signed the protest against brick, argue that the brick pavement will be as slippery as asphalt. Would such be the case? THE CLAY-WORKER, being an advocate of brick pavements, wishes those of your contributors who have had any experience in this line would give us the benefit of same.

I take it, from what I have read in THE CLAY-WORKER, that a brick street is not nearly so slippery as asphalt. If we can demonstrate the fact to the satisfaction of our county commissioners, many of our roads will be permanently improved with brick. While I have no brick to sell, I would like to see more brick used on our streets and highways, feeling confident that brick pavements are the best. Most of the roads and streets here are macadam, and in the summer time we are blinded by the dust, otherwise the roads are fairly satisfactory, except that they are a continual care. Trust that some of your paving experts will come forward with information that will enable us to combat the prejudice against smooth pavements, resulting from the introduction of asphalt.

New Brunswick, N. J. PROGRESSIVE.

Illinois Convention Notes.

Editor CLAY-WORKER:

Reading the very full report of the Illinois Clayworkers' Convention, found in your January issue, I beg the privilege of correcting through your columns a misstatement made by a member on the floor of the Convention, and of adding a word or two concerning other points raised during the discussion concerning hollow building blocks. Mr. A. R. Batley is reported as saying that the writer had stated in the columns of a clay journal that ornamented hollow blocks could be laid in the wall at $5.50 for the equivalent in bulk of a thousand brick. Mr. Batley is respectfully requested to name the clay journal and the date and page on which this statement attributed to me appears, which, when done, I shall be glad to apologize to him for calling his statement in question.

In a paper read at the same Convention by a Chicago gentleman, having for its subject hollow building blocks, he makes complaint that he cannot secure from the block makers he represents the variety of goods demanded by his customers, and which are shown in the catalogue of a well-known clay machinery concern. The gentleman is unfortunate in not representing some one of the Ohio manufacturers of blocks; the Canton & Osnaberg Co., for instance. It is purely a question of enterprise, and indicates that there is an opening for a wide-awake hollow building block manufacturing concern in Illinois. Indirectly the question was raised of the propriety of calling ornamented hollow blocks terra cotta. Let us see what the dictionary and cyclopedia men have to say concerning material that may bear this designation .

The Century Dictionary man says: "Terra cotta is a hard pottery made for use as a building material and similar purposes, of much finer quality and harder baked than brick."

It strikes us that the "dictionary man" wrote before making the acquaintance of the pressed plastic fire clay beauties, to be found in the market to-day, and comparing both in hardness and quality with so-called terra cotta wares made from the same clays, and further, that his definition is altogether inadequate. "Usage make laws," we are told. Let us turn to technical works for further definitions. "Spons's Cyclopedia of Manufacturers" has this answer:

"Terra cotta is a term commonly applied to work of an artistic character, made of clay and burnt." While in the "American Cyclopedia of Commerce" we are told "Terra cotta, or baked clay, is midway in quality between earthen ware and tile clay, but always has some artistic finish."

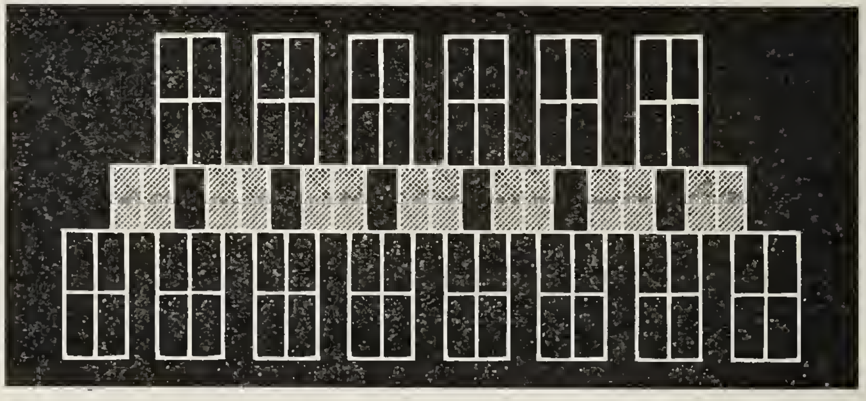
We submit to your readers that a plastic fire clay block having an ornamented face is entitled to the designation under all three of the definitions given. Under the first definition (Century Dictionary), the plastic fire clay building brick are included, and we question whether "Artistic character" and Artistic finish," mentioned in the other definition, does not apply to them as well. "Terra cotta pressed brick" will certainly describe many of them. Yours truly, E. G. Durant.

How to Set and Burn Dry Press Brick.

Editor CLAY-WORKER:

I notice the inquiry under the above head in February issue and will give my version of the trouble and the remedy my experience suggests. Cracking in arch brick comes from four causes principally:

First—When clay shrinks a great deal of the shrinkage has a tendency to pull the brick in two, if it is held tight in the arch, as it generally is, especially where a brick or course of brick binds two parts of the bench or arch together. If the brick has great shrinkage it is not wise to try to make the arch shrink and settle as a whole by tying it together, as a great quantity of broken brick will result. If you are setting a two or three-brick bench, put up each brick or part independent of the other, and, if bracing is required, put braces of fire brick from bench to bench across the flues or eyes. This will keep the benches from buckling and falling down into the eyes. In the case which came under the writer's notice we set the arches fourteen high, with three-brick benches, in a seventeen-arch up-draft kiln, the eyes being only eight inches wide. We gave up trying to bind the benches together on account of the great quantity of broken brick it occasioned, and now set the benches in three separate sections, preferring a little unevenness in settle to the broken brick. We set the brick in the arches in pairs, or bunches, and put a tight course every third course. The fracture resulting from this pulling apart is almost straight across and has a rough or stony surface; the halves of the brick are usually left sound and strong.



Brick Set in Bunches. The Middle Course was Originally the Tight Course.

Second—When tight courses are used in setting they form a very large bulk of clay, which dries slowly, much slower than single brick or the rest of the kiln; a shell dries over a wet interior, and, being unable to shrink, it cracks. This form of crack or check is generally fine and hair-like and destroys the soundness of structure of the brick. If the cracking is due to this cause, try to leave out the tight courses by setting the brick in bunches all through the arch. Face the first two courses, and, breaking joints with the third course, set back over the first two courses and facing two more. Try and have the spaces between the bunches run straight through from one arch to the other, so when you fire in one arch the smoke can rush through into the other.

Third—A sudden chill during burning will harm some clays very greatly, and shales are prominently of this class. When they have become vitrified, or even partly so, great care must be taken to keep them from being chilled, as they will shatter like a piece of bottle glass. This style of fracture is smooth and glassy, and is apt to run in graceful curves, sometimes cutting the brick into three or four pieces with very sharp edges.

Fourth—The end of a brick which is nearest to or exposed to the fire will vitrify first, and, of course, take on a different rate of expansion and contraction. If burning proceeds gradually no harm results, but if the brick is chilled it will crack in two along the line which separates the vitrified from the unvitrified end, due simply to their difference in contraction. This cracking may occur with clays that are otherwise able to stand considerable changes in temperature. Without the checking, as explained in Case 3, the fracture is generally clean and straight across and not very rough of surface, and the two halves or pieces are as sound as ever. The remedy for Cases 3 and 4 is easily seen to be the avoidance of great and sudden changes of temperature. MOORE LIGHT.

Wants to Know How to Construct Dry Sheds and Prevent Cracking.

Editor CLAY-WORKER:

I read your CLAY-WORKER regularly, but am like the boy who is taken out of arithmetic and put into algebra. There are lots of things I do not understand, and could not use if I did. I have a small brick plant, auger machine, twelve to fifteen thousand capacity, and have been trying to dry out in the air. I now want to change to sheds, and do not know how to make them to dry best. Should they be built eight, ten, twelve or sixteen feet wide? My clay works like lead, smooth and nice, but when I go down as low as five feet it will crack badly with sun exposure. The top clay, for two feet, does not crack at all, but I do not like to skim over. I would like to have a book with plans of good old-style up-draft kilns and instructions how to set. Our clay melts in the eyes if set too much out. Would like to know how to prevent this. L. W. C.

Durant, March 10, 1899.

Mason City Gets the Next Iowa Convention.

Editor CLAY-WORKER:

Please announce in your paper that before leaving Sioux City, the Executive Committee of the Iowa Brick and Tile Association decided that the next meeting of the Association will be held in Mason City, at a date to be fixed later on. A rousing meeting is promised, and a royal welcome will be extended to all the craft.

I am sending you by this post a photo taken specially for the CLAY-WORKER—the first I have had taken in many a year. The Sioux City convention was very pleasant and profitable. The weather is still stormy, cold and backward. We are running every day; have not stopped in two years. I found on returning home that our men had turned out more ware the week I was at Sioux City than usual. That is the kind of men to have.

I hope to see you at our convention at Mason City next year, and I promise you a good time. Sincerely,

MASON CITY, Neb., March 10. O. T. DENISON.

New Orleans to Have an Exposition.

My Dear Mr. Randall:

During the great press of business in my present occupation I have entirely lost sight of the Convention held in Columbus, and although it was utterly impossible for me to have attended, and which fact I certainly regret exceedingly, it was, nevertheless, my intention to have remitted my yearly dues and for the subscription to THE CLAY-WORKER, and facts are only now again called to my attention by the receipt of your circular letter of the 18th, and in reply beg leave to enclose herewith postoffice order for $4 to cover both, and for which kindly acknowledge receipt.

Under the auspices of the Progressive Union we intend holding a fair, as shown above, and in which movement I am taking a very active part. Now it occurs to me that it might be of interest to the readers of THE CLAY-WORKER to know what is going on in connection with the exposition we are getting up, and, if so, I shall be pleased to put your paper on the list of those to whom we regularly issue our literature on this matter, and, if you think so, kindly let me know, and I will see to it that you are not overlooked. Perhaps it might be of interest to the clayworking machinery men to know of this opportunity of making an exhibit, for I well remember that the exhibit made by our late friend, S. J. Fletcher, at our cotton centennial exposition, in 1882, was purchased by me, and resulted in establishing the first steam yard in the State.

Kindly let me hear from you, and in hopes that all is well with you and yours, I remain, yours very truly,

J. A. BLAFFER.

Convention Echoes by One of the Stay-at-Homes.

To me it seems quite strange that a manufacturer should get up in a convention and complain that other brickmakers come in his market and sell brick for $1.50 per 1,000 less than he can make them for. It looks as if he thinks no one should leave his "ain fireside" to sell his ware. By his own admission it looks like a case of being behind the "age" in conducting yards. The report of the committee which was appointed in 1897 to advance the use of brick in building does not appear. What was the cause? Was there no ground to cover? The size of brick seems to be like flaunting a red flag before a "gentleman cow." It would look as if not much brain matter had been expended on the subject. Each manufacturer has his molds made so that his brick will set right and so that his fires will work freely. The larger the brick the more clay and sand will be used, as well as more fuel to burn them. It seems as if the manufacturers were digging holes for themselves, when they want the engineers and architects to specify that no brick but such and such a size should be used. It seems a far-fetched argument, when the gentleman was alarmed about a building being in danger of falling because of the use of two sizes of brick. The builder and architect will take care of that. Make and furnish good stock, and do not make trouble for yourselves would be good policy. If different sized brick endangered a house, about all the large, not to say small, houses in the larger cities in the country would have fallen long ago. Do not make trouble; it will reach the brickmaker all too soon.

It must be surprising to many readers to learn that one gentleman, a dealer, had a great deal of trouble to get brick of the same size, and cannot find others to mate them with. There is always two sides to a question, and a simple explanation lets in the light ofttimes that shows some one had not or did not want to make a matter clear. The New York city market will furnish all the brick of a size for any one building from one yard or many. If a builder will persist in using all the stock he has on hand, and then expect to go on the market and find more just like it, he may have difficulty in getting them immediately, but the day before or the day after there would probably be a million or more at his command. The trouble with this party is that he is holding off in the hope that the brick may be bought for less money. There is one certain way of getting the stock from one yard, and that is by engaging from the agent of one yard all the stock required. It would cost a little more per thousand, and that is where the shoe pinches—buying cheap when the market is well filled and sluggish. The great bugbear of my neighbor making a larger brick, and being able to sell them when I cannot, should not be the cause of fear. The large brick may be the cause of his retirement for good.

The long wait has been rewarded by the open confession of Mr. D. V. Purington, at the Peoria, Ill., Convention, as regards the use of dryers versus sunshine. In the CLAY-WORKER the dryer has been held forth by some as the way to make brick, and anyone who did not use the dryer was behind the age. The different writers did not seem to consider that circumstances of location made a difference. Dryers all should have, has been the cry, and I think that Mr. Purington has in his article shown that most of it has come from those who had not acquainted themselves with the status of the industry in the sections of the country East, West, North and South. We will take Haverstraw as an object lesson to show that for use the dryer would be needless. They begin molding at half past 4 a. m., get pit out about 10 a. m., and if by 4 p. m. they are not fit to hack they cannot get them up that day. If the day is clear and the sunshine bright, at least two hours before the hour named all that day's brick will be hacked. Is there any use of a dryer and the expense connected with it? Again, the majority of the yards are leased. Where is the man that would go to the expense of putting such an improvement on another man's property? Once again, would the dryer men explain, where are the yards going to dispose of all the stock that can be turned out by the every day dryer? If a yard stops molding in October, and the shed is filled by the time navigation is closed, about half the shed is empty and the long spell of ice comes, so that not a brick can be moved, and the dryer must stand still, of what use is it? Go along the Hudson, and the same condition will be found to exist. No call for stock, and no way to get them there. Where there is a market reached by rail then it can be utilized to advantage. Probably there are many who will never see that paper, and it is to be regretted, as no doubt if they did some at present and others in the future who may think of putting in dryers would give the matter considerable thought before they left the old way.

Mr. Purington, no doubt, gave much thought to the article in question, and it is one which reflects credit on him, not only in the way he comes out and admits that he may have been wrong, but that it is written in such a way and by one who has had an extended experience on the subject gives it strength. More papers on that and kindred subjects makes all take an interest. May Mr. Purington be called on often to treat the readers of the CLAY-WORKER with matter of this kind is the wish of A READER.

Pittsburg Brickmakers Organize.

Editor CLAY-WORKER:

The annual conventions of the N. B. M. A. are very helpful to those who participate, if for no other reason than the fact that it brings brickmakers together in a friendly way. When competitors become friends the evils of competition are considerably lessened. At any rate this has been the case with us Pittsburg brickmakers, if I may judge from the talk of those who attended the Columbus Convention. The entire party returned home in a very "mellow" mood. The ring leaders, Mr. Albertson, of Booth & Flinn; Xavier Wittmer, of Wittmer Bros.; Grant Dibert and Evans Jones, arranged for a meeting, which was well attended, all present pledging themselves to assist in the forming of a local organization. At a subsequent meeting a permanent organization was formed. A charter has been applied for under the name of the Western Pennsylvania Brick Co. George H. Albertson is president, Xavier Wittmer is vice president, Samuel Francis treasurer, W. C. Lynne secretary, and William Sankey manager. Those who are acquainted with these gentlemen need not be told that it is a strong organization, one that will make the paths of the Pittsburg brickmakers much smoother and pleasanter than they have been of late years, to say nothing about the profit end of the business. The latter seems much more promising, however. Already the price of brick has advanced $1.50 per thousand. As one member of the association said to me recently, "It appears as though organizing and raising prices stimulates the building interests. At any rate, there has been more brick sold here this spring than for a number of years. Evidently the brickmakers here are going to have all they can do to fill their orders."

Following the suggestions made at the Columbus Convention, our local organization has adopted the standard size of brick recommended by the National body, and will endeavor to see that it is used exclusively in this market.

A preliminary to the permanent organization that proved very intresting to those who participated was the sending of a committee composed of Messrs. Albertson and Wittmer to Chicago for the purpose of investigating the Chicago plan of organization. The committee has never made a full report of what happened on that trip, but, from what they have said at odd times, it is generally understood that it was a very pleasant as well as a very profitable trip. All the committee will admit is that they were royally entertained by Mr. Purington, who gave them all the information they sought, and threw in for good measure a varied and rich assortment of eatables and drinkables. They are a little reticent about the social features of their trip, but admit they are indebted to Mr. Purington for many favors. More anon. HARRY HOOD.

Pittsburg, March 7, 1899.

DEATH OF WILLIAM D. BUDD.

The ranks of the Hudson river brickmakers have been broken into by the death, at the age of 75, of William D. Budd, of Dutchess Junction. Mr. Budd entered the trade without any knowledge of it, but had as a partner Mr. Charles Griggs, a thorough man in all respects, and from him Mr. Budd gained that insight necessary to make a first-class common brick. It was no fault of his that the best was not always in sight, as he kept his yard and machinery in the best condition possible, and tried to have the best men in charge of it, and, if he failed, it was not for want of effort on his part. Mr. Budd could go under another shed and see a poor burn without commenting on it, but on his own yard it was a source of irritation if his kiln was not an A No. 1. His painstaking efforts entitled him to the success he attained. So they all pass away. He left no son to succeed him. J. I.

TOLEDO'S WAY.

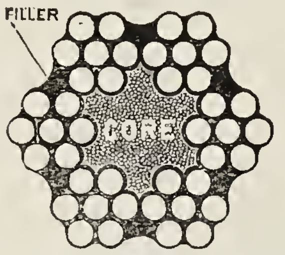
A Peculiar Manner of Selecting Paving Brick.

City Engineer Brown, of Toledo, has received responses from nearly all of the brick manufacturers to the request of the city for sufficient brick to pave a portion of Madison street, from St. Clair to Summit. Only one firm refused to contribute brick. This was the Buckeye Brick Company, of Wellsville, and it gave as a reason that its brick were so well known that they needed no advertising. The other manufacturers heard from expressed themselves as thoroughly satisfied with the test and glad to donate enough material to make the test a genuine one.

It is the intention of the Council to pave strips of this street with certain brick, and then keep a close watch on the wear and tear of each quality. At the end of a year the brick will be thoroughly examined, and the one which has stood the wear best will be adopted as the brick for use in the city. It is hardly possible that all other brick will be excluded from the specifications, but the test will go a long way towards deciding the particular brick to be used. The contract for this street will be one of the first awarded in the spring.—Blade.

PRESERVATION OF WIRE ROPES.

THE ACQUIREMENT of a material for treatment of the manila or jute core in the process of manufacture of wire ropes, possessing pliability, lubricating and waterproof qualities, and free from destructive acid, has been diligently sought by wire rope manufacturers. There are numerous places where wire ropes are liable to become water soaked almost immediately after installation (where not specially prepared to resist moisture), such as cable railway service, wet mines, dredging machinery, power transmission and in many other places of exposure. The wire ropes of elevators in offices, stores, warehouses and general buildings sometimes show an outside corrosive effect, which too often is but suggestive of the more serious hidden internal conditions. Not infrequently the interior of wire ropes reveal disintegrated cores and corroded wires, even where there may be little evidence of deterioration externally. The illustration herewith presented shows application of a special material known as "wire rope filler," by which the core is lubricated, and a flexible cushion interposed between it and the strands. The filler exuding between wires prevents abrasive wear, seals against acid, gaseous or water attacks, and forms a foundation on which an outside coating should speedily build. Many of the prominent wire rope manufacturers have adopted the use of this filler on all kinds and sizes of operative wire ropes. The manufacturers of this filler also make an outside coating termed "wire rope shield," for external protection against abrasive wear, and to completely seal against exterior attacks. A substantial increase of life is evident from the internal treatment and furthered by the external protection. The Ironsides Company, Columbus, O., manufacture these materials.



Marion Shovels for Russia.

The Marion Steam Shovel Co., Marion, O., the firm that has made a large majority of the steam shovels used on the brickyards of this country, report an unprecedented demand for their heavy shovels and dredges. They recently booked an order for thirteen of these ponderous machines for shipment to Russia.

A MISUNDERSTOOD VALUE OF CHEMICAL ANALYSIS.

A Paper Read Before the Ceramic Association of the Ohio State University by L. E. Barringer.

MANY ENGAGED in the manufacture of clay products do not fully appreciate the advantages to be derived from the application of chemical principles to their work, and it is safe to say there are yet some who do not at all appreciate this, and believe they can get along just as well without the aid of chemistry as with it. But perhaps the one phase of chemistry whose importance in the ceramic industry is most doubted is the chemical analysis of clays, and whether knowing the ingredients of a clay and their percentage amounts can be valuable or useful information is frequently questioned.

To look into the matter, we will take a case where there would be doubt, ordinarily, as to whether or not to look for aid to chemical analysis, namely, the opening up of a clay property. We will suppose a man has a clay bed which he desires to develop into the product for which the material is best suited. He is undecided whether to send a sample of his clay to a chemist or to have a purely practical test made by some of his friends in the business or by a machine firm. Let us imagine him sufficiently level-headed to do both, sending the machine firm and the chemist each a sample, and let us follow the two samples thus sent out.

The machine men try his clay on their machinery, we will say the dry-press process for brick—the clay is not adapted to it. Then they try it for stiff-mud brick and get good results. That settles it! The clay is just the thing for stiff-mud brick, and the owner of the material is advised accordingly. The machine men have settled the matter for him to a T, although, to be sure, they have simply tempered and molded his clay, probably observed its drying qualities, and perhaps burned a sample brick or so.

Meanwhile the chemist has set to work on his sample and first makes an ultimate analysis of the material, with a result something like this:

$Si\ O_2$	65.32
$Al_2\ O_3$	22.63
$H_2\ O$	7.42
$Fe_2\ O_3$	1.81
$Ca\ O$	.25
$Mg\ O$	.67
Alkalies	1.72

He notes at a glance that what are sometimes known as the detrimental impurities, or those ingredients not included in the composition of pure clay [namely, in this case, iron (Fe 2 O 3), lime (Ca. O), magnesia (M g O) and the alkalies (Na 2 O and K 2 O)], are low in amount. This means that the clay has some refractory qualities, but not the highest, as the silica is rather high in proportion to the alumina for a high-grade fire clay. Knowing that the limit of fusible impurities in fire clays, however, ranges from four to five per cent., he makes note of the fact that his material falls within this limit, but very near the outer edge.

Next he observes that there is not much iron present, and immediately gets a clew as to the color the clay will burn; certainly not dark, probably buff, possibly lighter.

The alkalies, which occur in all clays in connection with feldspar and mica, tell him what must always be looked for in the presence of these minerals, namely, a more or less degree of fusibility, depending on the amount present.

The lime and magnesia, he observes, are not present in sufficient force to play a critical part in the clay's behavior, but he knows that these ingredients are also fluxes and must be looked after in larger quantities.

The chemist now begins to place his material. It is not a pure kaolin, nor a ball clay, nor any other of the raw materials which he could sell to makers of white ware and high-grade pottery. It is not a high-grade or flint fire clay, and its use for No. 1 fire-clay goods is barred. It is apparently not sufficiently fusible for paving brick on account of the low range of impurities. He finds by thus sifting it down, that earthenware, stoneware, or, possibly, terra cotta, embraces the uses to which the clay is best adapted, and having thus placed it as accurately as possible from his analysis, he now makes a few practical tests to close the matter and prove his conclusions. On burning a part of the material he gets the buff color expected, and also tests the fusibility. Plasticity, which chemical analysis cannot gauge, he determines by the bonding power of the clay. The refractoriness he finds sufficient to stand salt glazing, which firmly sets in the sewer-pipe and stoneware class of clays, and the fact that it burns to a light color gives it to stoneware.

It will probably be said: "Yes, but the chemist had not sufficient faith in his chemical analysis to refrain from practical tests." And right here is where the value of chemical analysis is misjudged, and, consequently, misused. No clay can be read like a book from purely chemical data, but the latter is the key by which the hidden properties of clay can be brought to light, and it is by using the chemical analysis as a guide and pointer-out that its greatest value is obtained.

How far more satisfactory and complete is the chemist's report, made with his chemical analysis as a guide than that of the purely practical testers who work ahead until they find some one use for which the material is more or less suitable, and there stop, for it is blind work, indeed, beyond. In the above case, on the advice of the machine men, the clay would have gone into brick; according to the chemist's report, it is suitable for several wares, but its properties, all considered, show its best fitness for stoneware.

Furthermore, the chemist's work on a material which is to be developed does not stop here, by any means. Suppose, for instance, the clay sent him had contained lots of iron. By special tests he would have determined how this iron existed in the clay, whether in the ferrous or ferric state, whether as a carbonate, as a hydroxide or as a silicate. He would also have reported just what effect the form in which it was present would have chemically on the other ingredients of the clay. He would know that ferrous carbonate is a difficult factor to handle in burning and will cause serious trouble unless its presence be known and the proper precautions taken; also, that ferric hydroxide is much less objectionable, and, for a good red color, very desirable; that iron sulphide or pyrite is to be dreaded on account of its destructive fluxing qualities should it go into silicate combination instead of oxidizing.

Similarly with the lime, magnesia and alkali compounds. Many dollars would have been saved in the ceramic industry had the owners of certain clay banks known before commencing operations that their material contained sufficient lime sulphate to whitewash every piece of ware made from the material. And yet a chemist would have discovered this fact in a very little while.

And again, if a clay has been found suited to white ware, say, the chemist then makes his rational analysis, determining the clay substance, the fieldspar and the quartz, so that the potter knows at a glance what the mixture needs to adapt it to his requirements.

It is evident, then, that the chemical analysis, as such, is of little practical worth, but it is in knowing how to interpret that renders it valuable. The misunderstanding heretofore existing has been because of this fact. In many instances the analysis is made by one who cannot interpret it, and in such a case it is not worth the cost to have the work done. But properly handled by a chemist who knows what every result which he obtains means and what his analysis indicates, it becomes immensely valuable in the clay industry.

Shreveport's New Pressed Brick Plant.

If we may judge from the report of a local paper, the new McCormick dry pressed brick plant at Bossier is a model establishment. Bossier is a fast growing manufacturing town across the river from Shreveport. This, together with the fact that there is an abundance of excellent clay there, induced Mr. W. J. McCormick, one of Shreveport's enterprising citizens, to organize the company which bears his name. He believes that what is worth doing at all is worth doing well, so he sent samples of his clay to St. Louis, where it was carefully tested and proved to be admirably adapted to the dry press process. He accordingly purchased a complete plant from the Ross-Keller Brick Machine Co., which in due time was erected under their supervision, and the plant is now turning out 30,000 excellent pressed brick per day of ten hours. Mr. McCormick is thinking of putting in an electric lighting equipment, so as to run a night crew, thus doubling the capacity of the factory. Mr. McCormick is especially pleased with the Ross-Keller press, which he thinks is a triumph of mechanical skill. The brick as they come from the machine are smooth and solid, and so strong that all efforts to break them in two with the hands is futile. When burned they are very handsome, both in color and form. The plant has excellent shipping facilities, and is destined to be one of Shreveport's most important industries.

THE CLAY-WORKER

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A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXXI. MARCH, 1899. No 3.

CURRENT COMMENT.

The Convention season is over, and the last of this year's crop is reported in this issue.

* * *

Like those that had preceded it, the joint Iowa and Nebraska Convention was very successful, both in point of numbers and enthusiasm.

* * *

THE CLAY-WORKER is the only magazine that has given these Conventions any material support, and is, therefore, the only trade paper entitled to consideration in this connection.

* * *

We have given generously of our space, time and means to Convention interests, and will continue to do so, because we believe that associations, whether local, State or National, are beneficial not only to those who participate in them but to every one connected with the trade. These trade associations stand for progress, and THE CLAY-WORKER stands for the associations.

* * *

The "King of Button-holers" is now enjoying a season of rest with his family, way down South on Mobile bay, where he can study the festive 'gator and the luscious oyster in all their native charms. As a result we expect on his return a new series of "Button-hole Talks" that will discount any that have gone before.

* * *

Trusts and rumors of trusts burden the air. The press of Chicago has for weeks been filled with accounts of a great brick trust being organized there, which is to swallow up all the brickmakers of that big city and their brick plants, too, but it hasn't done it yet.

* * *

Another great trust has been given column after column of space, both at Chicago and other news centers. It is the paving brick trust. According to the veracious news gatherers, this monopoly was to absorb all of the paving brick manufacturers in the United States. Not sure that this would give them absolute control of the business, the trust was also (according to the reports) to buy up all the clayworking machinery manufactories in the land. This, too, has failed to come to pass, as the reader may surmise by turning to our advertising pages.

* * *

We have an inquiry from a correspondent in regard to the use of brick for paving streets where the slant is thirty-five feet in 200. We do not see that any material should be discussed for a street of that slant. Certainly asphalt, stone, wood brick or any other material would be slippery and dangerous of passage at times under such circumstances. The question of engineering in this matter comes not in the selection of the material, but in the making of the proper grade. We believe that brick would be quite as satisfactory as any other material and better than some. We remember to have seen a brick pavement where the slant was greater than this, but it was rarely used for vehicles, and then with some difficulty.

THE SNEER HABIT.

The able philosopher who wields the editorial pen for Puck discourses wisely on the evil habit of sneering at everything and everybody, thus: "When little children wrinkle their brows into scowls and look ugly they are warned that their faces will 'grow that way' if they don't stop it. This usually brings back gentler contours of the face, for a time at least. It is a great pity that there is not some watchful nurse to give the same warning to certain grownups among us who are addicted to sneering at everything under the sky but their own private opinions. For it is true that the face of the scowling child does grow that way; and it is quite as true that the mind of the sneering adult grows that way, so that he can never do anything but sneer, even in the presence of that which he would otherwise perceive to be worthy. * * * The chronic sneerer must not be confounded with the simple pessimist. The pessimist, believing that everything is wholly bad because it was made that way, is a wellspring of blithest cheer compared with a sneerer. The pessimist believes that no one can help matters any; but the sneerer believes that everything is bad, solely because a perverse world will not adopt his own private way of doing things. He sees it going wrong in spite of his warnings, and the sight embitters him. * * * We cannot but wonder why the sneering editor persists in staying in a world such as he must conceive this one to be. It is utterly bad, and there is no hope for its betterment. Suicide in his case would emphatically be no sin. All persons are warned against reading such publications and against associating with or listening to individual sneerers. There is danger of infection, and we need all the people we can have who are able to see a little beauty and goodness in the world—even in the United States of America."

We commend this sentiment to our contemporaries, who, by their worse than cynicism, turn joys to sorrows. If it is not already too late, stop looking ugly. You only embitter your lot. It is just as easy to look cheerful and a whole lot pleasanter to those whom you inflict with your presence. Even if you do feel sour, try to look sweet. You may not succeed at first, but try anyhow. It can do no harm, and may help you.

BUILDING PROSPECTS.

Anyone who glances over the construction records will see that a great deal of building will be done this year. The promise is for a very active trade. It remains to see if our brick manufacturers will take advantage of it. Following periods of relative dullness it often happens that dealers will move along in the same old rut of strife and complication, and sell for less than the market demands or makes possible. There was a time when architects were always ready to give out reports of advanced work. Now that time has passed.

The shrewdest men in the profession keep quiet about what they have until the letting period. This is done with the idea of bearing prices. But the permits being issued, which, of course, come immediately in advance of the work being done at this time, indicate strong possibilities of good business, and, if brick manufacturers of the different localities would sit down together, smoke a few cigars and discuss prices, they would soon learn that all were much nearer the idea of understanding on prices when considering a question of this kind as a body than when considering it from their own offices and from the gloom of former years of suspicion and hard business. The manufacture of brick, the chemistry of clay is one thing, and the business of selling brick at a profit is another thing. Both conditions may not come out from beneath the same hand. One is as necessary as the other. One may have the best chemistry, the best knowledge of brickmaking, and yet be a dead failure in the making and selling of brick. Both conditions are absolutely necessary to success. We sometimes feel that the brickmakers' organization could, for a time at least, afford to specialize on business to the neglect of the technicalities of brickmaking.

MAKING BRICK IN PORTO RICO.

It seems as if it is now in order to change the old, familiar expression of "Westward the star of empire" to "Southward, ho!" for many of our enterprising and venturesome citizens are headed toward our new possessions in the "Indies." The first venture there in the brick line that has come to our notice is that of a Philadelphia syndicate. Stalwart Frank B. McAvoy, vice president of the N. B. M. A., writes that a company with which he is connected has obtained a franchise for the manufacture of brick and other clayworking products in Porto Rico, and will begin operations at once—in fact, are already making brick by hand, having booked an order for 400,000 building brick.

A first-class stiff clay plant will be erected and put in operaiton as soon as the machinery can be obtained. It has already been ordered from Chambers Bros. Co., and will probably be on the way within ten days. Frank is one of the active movers in the enterprise, and may have to go to the new country to personally manage the business, which bids fair to be extensive.

INSURANCE AND BRICK.

The New England Factory Mutual Insurance Co. recently published its annual report. On about $111,000,000 risks the losses were approximately $34,000. The interest on premiums was a little over $35,000. Thus it will appear that the principal item of cost was that of inspection and office expense. The New England Factory Mutual Insurance Co. does not do business in this section. Its risks are within a radius of 500 miles of Boston. It is a pattern to which all insurance organizations in the world may look. It insures a class of extra-hazards at the very low cost named. This low rate of insurance is owing to good construction, adequate apparatus and discipline. The study of this company has always been to reduce the cause of loss. Fire must and will occur, it is said. To keep them from becoming destructive is the ideal of all true insurance organizations. Without proper direction, without special thought it is not expected that owners of destructible property will give matters of this kind serious or effective attention. People, as a class, will not even keep their streets and yards clean. They will not properly drain their houses. They will not put in proper sanitary apparatus of any kind unless they are compelled. Of their own volition they will not give such matters proper thought. Otherwise, why should there be sanitary laws? The Factory Mutual Organization shows what may be done by studying questions of its kind in a direct and special way. The material which this concern uses for its buildings are brick for the walls and wood for the posts and girders. No joists of the ordinary type are used. It is on the principle of what is known as slow burning construction. It may be well to state that this organization directs how all of the work of building for the various companies offering their risks should be constructed.

A RARE CONVENTION ECHO.

An echo of the National Convention, very pleasant to the worthy president of the N. B. M. A., occurred Saturday, the 11th, when the Columbus brickmakers met, ostensibly to talk over the Convention. Mr. Richardson considers himself one of the Columbus contingent, and so accepted an invitation to be present, without the least suspicion that anything unusual was to occur. He was, therefore, taken entirely by surprise when Mr. L. G. Kilbourne, treasurer of the Columbus Committee on Entertainment, made a happy little speech and presented him with a gold medal similar to those worn by the delegates Convention week. Mr. Kilbourne explained that the one presented at the time Mr. Richardson took the president's chair was gold in color only, and that the brickmakers of Columbus wanted the president of the N. B. M. A. to have the real thing. That President Richardson was delighted goes without saying. He says it is indeed a precious medal to him, and will be worn at the next Convention, a silent but potent evidence of the generous spirit which actuated the local committee in all their efforts to entertain their guests.

BRICK ROADWAYS.

In exceptional instances brick has been used for country roadways. The time is not far distant when its use will be more general. The cost, of course, is greater than the ordinary gravel road. On the other hand, it is well to bear in mind that no good pavement has ever been devised for a city where the price made it prohibitory. We believe that if a pavement very much superior and very much more expensive than any now in use should be devised that the price would not keep it out of use. In relation to country roads the general principle applies. There was a time when the farmer said that the dirt road was good enough, and roads which were so bad as to keep heavy teams from taking produce to market were by no means uncommon. We have heard in public discussions by farmers the statement that what was good enough for their fathers was good enough for them. That spirit is on the wane. In many sections it is now the exception rather than the rule. The spirit of progress in road building will extend from the city into the country. In sections where gravel and broken stone are not readily obtainable brick is the logical material.

MR. PIKE SUSTAINS A GREAT LOSS.

The many friends of E. M. Pike, the veteran tilemaker and kiln builder of Chenoa, Ill., will grieve to learn that he has sustained a great loss by fire. One of the principal blocks of Chenoa, in which was located a fine new hotel and other buildings belonging to "Father" Pike, was recently burned to the ground. His loss, in excess of his fire insurance, will exceed $15,000. His office and most of his books, kiln drawings, blue prints, etc., were burned, as was also a complete file of THE CLAY-WORKER, which he prized dearly. Writing of the catastrophe he says, "I tell you it made me feel sad indeed to see that handsome brick block that cost me so much work and money to erect licked up by the flames in an inconceivably short space of time. I have one source of satisfaction—no one but myself will suffer much loss, and, fortunately, I can stand it."

TRADE LITERATURE.

"The Buckeye Screen" is the title of a neat little booklet received from P. A. Arnold, Canal Dover, O. This screen, which is illustrated on page 300, is a radical departure from anything now on the market, and it is thought will prove a boon to manufacturers of dry press brick. This book tells all about it. A copy can be had for the asking.

We are indebted to the Crown Fire Clay Co., Akron, O., for a copy of a neat pocket catalogue of their fire brick, which in addition to the usual list of shape brick of all sorts, also contains some valuable tables for ready reference, giving the number of arch brick, wedge brick and key brick required, respectively, for various circles, the area of circles, the circumference of circles, all of which come in good play in the construction of kilns, furances, etc., and equally interesting and valuable tables showing the temperature required to burn various clays and other minerals. A copy of the book will be mailed to any of our readers on application.

We are indebted to the H. W. Caldwell & Son Co., Chicago, for a copy of their new catalogue, No. 25. It is a substantial book of nearly 400 pages, and quite ornate in appearance, being bound in flexible cloth covers of a light lavender color, with heavy lettering in bright red, and a border of dark blue. As attractive as is the covers, there is much of more interest between them to those who are using elevating, conveying and power transmitting machinery of any sort or character. The book is a storehouse of knowledge on these matters. It is profusely illustrated and systematically arranged and indexed, and represents a large investment of labor and money. It deserves a place in every engineer's library. A copy will be mailed free to those interested in conveying machinery such as mentioned in their ad. on page 294.

T. A. Rendle advises us that a company, of which he is manager, will establish a fire brick plant at Rawlins, Wyo., and says they are in the market for machinery for same.

A Vancouver, B. C., syndicate will establish an extensive brick manufactory on Howe sound. The work of clearing the site has commenced, and it is expected that the plant will be in place in about two weeks. The best and most modern machinery has been ordered. The promoters of the enterprise say that they have an unlimited supply of the very highest grade clay at the yard. It has been thoroughly tested, and gave splendid results. When analyzed it showed an average of 65 per cent. silica, which is almost enough to give fire clay, and it is thought that this quality of clay may yet be found at a greater depth. The tests at the cement works showed that a very even texture and hard brick can be made from the product.

TRAVELING SALESMAN WANTED.

A large Eastern firm of fire brick manufacturers write that they desire to secure the services of an experienced traveling salesman, one who is familiar with the line and out of a situation preferred. Parties desiring to make application for the situation will kindly address "FIRE BRICK," care CLAY-WORKER.

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3 1 cm GEORGE, care Clay-Worker.

WANTED — Situation as superintendent of dry press brick plant, by thoroughly competent man; excellent reference. Address
2 1 d H., care Clay-Worker.

FOR SALE—Three Eagle Represses, as good as new; scarcely used at all, owing to change of process, making repressing unnecessary. They are the latest improved design and will be sold at a bargain. Address BUSY BOY,
3 1 d care Clay-Worker.

BOOKS FOR BRICKMAKERS.

"CLAY GLAZES AND ENAMELS,"
Henry R. Griffen, C. E. $ 5.00
"BRICKMAKER'S MANUAL,"
Morrison and Reep, 3.00
"BRICKMAKING AND BURNING,"
J. W. Crary, Sr., 2.50
"TABLE OF ANALYSES OF CLAYS,"
Alfred Crossley, 1.00
"VITRIFIED PAVING BRICK,"
H. A. Wheeler, E. M., 1.00
"PRACTICAL FARM DRAINAGE,"
J. J. W. Billingsley, 1.00
Mailed, postage free, on receipt of price.
T. A. RANDALL & CO.,
Indianapolis, Ind.

Raymond's

IMPROVED
LINE OF....

Paving Brick Machinery.

✻

SEND FOR CATALOGUE.

✻

C. W. Raymond & Company,

DAYTON, OHIO,
U. S. A.

- "999" Brick Machine.
- "777" Brick Machine.
- Daytonian No. 1 Brick Machine.
- Daytonian No. 2 Brick Machine.
- No. 3 Brick Machine.
- No. 1 Combination Brick Machine and Pug Mill.
- No. 2 Combination Brick Machine and Pug Mill.
- Sewer Pipe Presses.
- Victor Repress.
- Columbian Repress.
- No. 3 Perfection Hand Brick Press.
- No. 3 Perfection Roofing Tile Press.
- No. 3 Perfection Dry Press.
- Nos. 1 and 2 Perfection Hand Presses.
- Clay Separators.
- A-1 Automatic Cutting Table.
- A-2 Automatic Cutting Table.
- Imperial Automatic Side Cutting Table.
- Unique Board Delivery Automatic Cutting Table.
- Triumph Side Cutting Table.
- Novelty Board Delivery Cutting Table.
- Combined Tile and Hollow Block Cutting Table.
- Double Shaft Pug Mill.
- Compound Geared Pug Mills.
- Single Geared Pug Mills.
- Clay Conveyors.
- Cup Elevators.
- Clay Screens.
- Dry Pans.
- Engines and Boilers.

ALL KINDS OF BRICK YARD SUPPLIES.

- Automatic Dumping Cars.
- Rocker Dumping Cars.
- Bottom Dumping Cars.
- Portable Track.
- Molds.
- Barrows.
- Trucks.
- Kiln Castings.
- Transfer Cars.
- Drier Cars.
- Turn Tables.
- Crats.
- Self-Contained Winding Drums.
- Bevel Geared Winding Drums.
- Winding Drum Fixtures.
- Tempering Wheels.

THE NEW YORK MARKET.

FEBRUARY 22.—The prospects for an early opening of navigation seem at present to be far distant. The past winter has been a record breaker. The ground has not been entirely clear of snow since November 24, with lots of ice to close the rivers and keep them shut.

The market is not suffering for the want of brick, as the heavy snow fall of last week would not allow the delivery of brick through the city. In this age of steam Haverstraw can generally be depended on to send in stock just as it is needed, so that the price will not reach the fancy stage. The towing company which handles all the brick from Kingston to Haverstraw always has boats in commission. If three or four barges of brick are lying at Haverstraw, loaded, and the river is full of running ice, they will send enough tugs to bring them through. With what covered stock is on hand, and what stock the dealers have piled in their yards for such emergencies, the danger of a brick famine is reduced very materially.

—1869—A Comparison—1899.—

Of what demand and supply would be in thirty years, 1869 was the banner year, and the call was such that there was no stock piled up to speak of, and when the river closed, or when the flats in Haverstraw bay were frozen over and there was running ice in the channel, and no brick in the market, called for heroic measures, and heroic measures were made use of at that time, as the trade was young compared with what it is today. Shipping facilities then were by sail vessels, carrying about 50,000 each. As soon as ice formed that stopped all shipments. Brick going lively at $12 to $15 per M would stand a good freight, but where were the boats to come from? The regular way of transportation was shut off, and the outlook was far from bright. Vessels without steam or sail must have some way to move them. Thirty years ago there were comparatively few tugs around the harbor, and they did not care to face the Hudson river ice. Like all great occasions in history, what did not seem possible to others was a stimulant to the man who was equal to the opportunity, and a plan was devised for the transportation of brick to market.

The pioneers in the first venture were not very many, as the timid ones would rather wait and see how the others made out. The result was that one of the Cornell Towing Co.'s sidewheel boats, which was specially built to break the ice, was hired, and, when she brought the tow to Haverstraw, it was a curiosity in its way—open canal boats, scows and a general mixture. Such a class of boats to ship brick in, in the month of January, would seem foolhardy. New York wanted the brick, the manufacturer required the money, or thought he did, and wanted it bad, or he never would take chances of sending stock in such a class of boats; but all's well that ends well, and that movement was a success. Money was no object then. From deep water to the yards was at least, in most cases, a quarter of a mile, and the steam boat could come on the flats only at high water. The brickmaker had men cut a canal from the channel to the yard to get his boats in and out. As before stated it worked all right. Others were quick to follow. From that date a large class of boats were employed, as it demonstrated to all that the size of the cargo made no difference in the sale.

"If" this winter's brick had soared up to, say, $10 per M, what a rush there would have been to get Haverstraw bay brick on the market! The difference of transportation equipment of 1869 and 1899 would soon have been apparent. Now each yard has a barge, and some have three or four, with a capacity of from 200,000 to 350,000. With a towing company that can send boats enough to take them through good, stiff ice, and then add to the home boat all barges that belong up the Hudson and New Jersey that is in New York, the market would be kept well supplied. Probably if the transporation facilities were not quite so good the price would remain steady. As it is now, in three days a good market in a seller's favor may be turned the other way, and the agent get a sendoff because he did not get a better price for the last cargo, when probably the same man had loaded an extra boat to get some of the good prices and with others started the market down. The brickmaker never does anything to push the market down, to hear him tell it. Go down to the dock and see the acres of brick waiting for a purchaser. Did the agent put them there? Not much (excuse the expression), as his peace of mind is disturbed by a full market. Did they come by chance? Far from it. When he sees the result and gets his returns from the cargo in market he will say, "I will never do it again," and he won't—till the next time.

—Will High Prices Ever Come Again?—

The present spring should show a stiff market and in the seller's favor, but will it? If trade has made such advances, and the number of brick kept off the market during the making season by wet weather and strike, the claim is made that their turn has come from a series of low to a paying scale of prices. The future is a closed book to us, and happily so for the peace of mind of all. Still there is left to all the right to make comparisons of the past years and what the present holds forth. It seems that the winter rates will only reach about such a stage, and there stop. Work goes on. Brick come from somewhere. Report goes out that a tow of ten or twelve barges started for Haverstraw. Market sticks. In a day or two word comes that the tow left for New York to-day. The buyer walks around, and, when asked if he wants anything today, will reply, "Yes, I want some dry brick to mix with what I have at the building. What are you asking for them? What!" he says, "navigation is open; they should be cheaper." Strange how unanimous that seems to be among them, and they are not quite so anxious for those dry brick. In a day or two the report gets out that the market is easier—not by purchase, but because the price is shaded. The present ruling rate would be a good one if it could be sustained and wages could be held down, as they were last year, but the coming season, no doubt, will see an advance. It is a fact that it cost more last year to make brick than the previous year, as wood advanced from a quarter to half a dollar per cord, and dry wood scarce at that. If the season of 1899 does not establish a good figure and hold it, it will show that the trade has reached a state that will call for active measures on the part of the makers to protect them from loss. It is but reasonable to suppose that the rush to make brick as early as possible will be general, and no doubt that all will turn out as many as possible. Will the market require them? Real estate circles do not seem to hold out such inducement, as in some lines it is somewhat backward, as comparison with 1898 will show. Last year there was cheap money to induce building. One of the largest savings banks of the city, which was carrying $28,000,000 of real estate, in January, 1898, announced that it had reduced its rate from 4½ to 4 per cent., the change not only affecting future loans, but also existing ones overdue and those that should become due. As a natural result it fixed the rate, and in some cases the rate was still lower. Not long ago a loan was made in Chicago, and on the same day one in New York, at 3½ per cent. All this certainly should tend to help along speculative building. The banks have had a large surplus on hand to help along, and the war scare did not last long.

—The Report of Building Department—

Shows a slight increase in number of plans, but a falling off in cost of same. In the borough of Manhattan the number of plans filed in 1898 was 3,592, with an estimated cost of $72,887,146; in 1897 the number of plans filed was 3,554, with an estimated cost of $86,456,664. In 1898 plans filed for alteration numbered 2,308, with a cost of $5,597,481; the number of alterations in 1897 was 1,808, with a cost of $7,582,323. From January 1 to February 18 the total number of plans filed was 521, to cost $11,136,229; same date in 1898 the total number filed was 379, to cost $10,886,575. The Brooklyn number of plans to date is 384, to cost $1,554,375; same time in 1898, 386 plans, to cost $1,863,901. If the good work goes on, this year should show what the trade is.

—The Present Market and Prices.—

While navigation is closed, there is no danger of a famine, as Providence will take care of the dealers by soft weather and of the opening of navigation at the right time to suit them; $6.25 and $6.75 are now the ruling rates, with $4 for pale.

HACKENSACK, N. J. A. N. OLDTIMER.

NO USE AT ALL.

Oh, what's the use of keeping store
  Unless the people know it?
And what's the use of enterprise
  Unless you try to show it?
What matters that your goods are best,
  Your prices tantalizing,
Or that they'll stand the public test,
  Unless you're advertising?

The "Monarch" BRICK.... MACHINE,

Unquestionably the

Leading Horizontal
"Soft=Mud" Machine.

More in use than other of its class.

◆

The

"Iron Quaker" Brick Machine

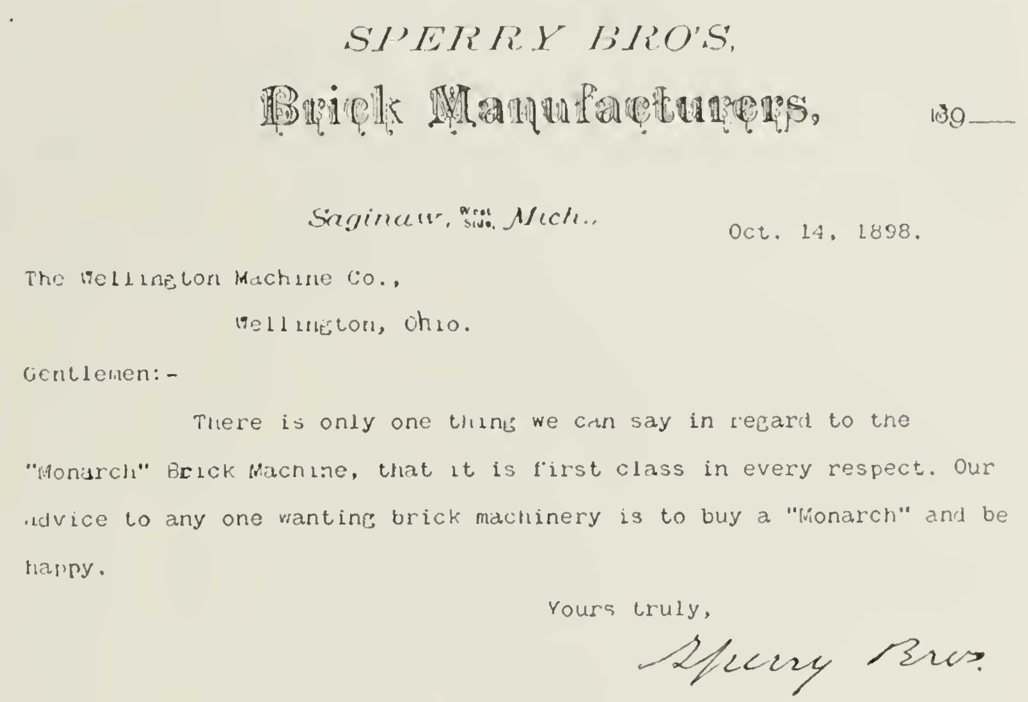
Unquestionably the

Leading Upright
"Soft=Mud Machine.

Horse and Steam Power.

More "Quaker" Machines in use than any of its class.

HERE'S ANOTHER GOOD ONE.



SPERRY BRO'S.
Brick Manufacturers, 189

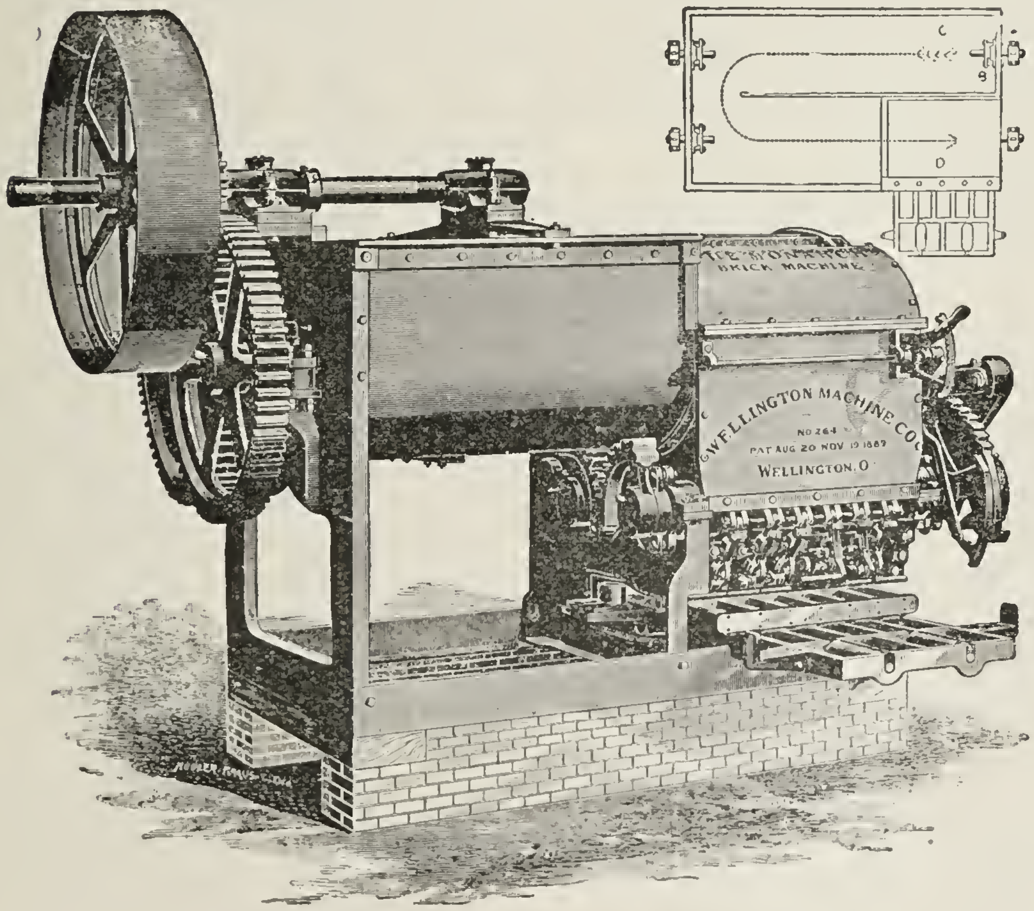
Saginaw, West Side, Mich., Oct. 14, 1898.

The Wellington Machine Co.,
Wellington, Ohio.

Gentlemen:-

There is only one thing we can say in regard to the "Monarch" Brick Machine, that it is first class in every respect. Our advice to any one wanting brick machinery is to buy a "Monarch" and be happy.

Yours truly,
Sperry Bros.



We have the Best and Lowest Priced

Mold=Sander.

◆

No one else makes . . . .

BALL-BEARING TRUCKS and BARROWS.

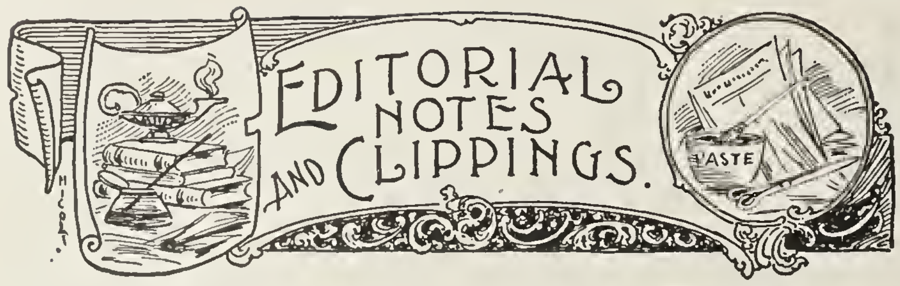
The Greatest Improvement in small articles ever put upon a brickyard.

◆

ALL OTHER AUXILIARY TOOLS,
MACHINES AND SUPPLIES.

The Wellington Machine Co.,

Send for Circular. Mention the Clay-Worker WELLINGTON, OHIO.



EDITORIAL NOTES AND CLIPPINGS.

A brick and tile factory is wanted at Capac, Mich.

Frank Ader will manufacture brick at Fowler, Ind.

A new brick plant will be started at Aberdeen, S. D.

J. S. Callhoun will open up a brickyard at Edna, Tex.

R. V. Richardson has bought a brickyard at Hampton, Va.

Alwine Bros. have started another brickyard at Berlin Junction, Pa.

Dr. G. Folks is preparing to manufacture brick at Waltertown, Ga.

Dodd & Lembme will manufacture brick at Albuquerque, N. M., the coming season.

Frank Rogers will start up a brickyard at Fayette, Ia., as soon as spring opens up.

Jas. V. Rose, of Sharon, Pa., desires to purchase a second-hand dry press brick machine.

W. O. Glass, of Yazoo city, Miss., will make brick this season on a Martin horse-power machine.

H. and T. Stevens will manufacture brick at Winnipeg, Manitoba, as soon as the season opens.

Wm. Burke, of Brewer, Me., expects to add some improved machinery to his brick plant this spring.

Mr. Fred Neuhaus, of Baker city, Ore., has decided that the Martin machine is the best adapted for his clay.

County Treasurer Schultz, together with other parties, will open up a brickyard at Mandan, N. D., this spring.

Bean Bros. will establish a new tile factory at Hartford, Ky. Work on the buildings will be commenced at once.

At the request of Mr. A. P. Morgan, a receiver has been appointed for the Battenfeld-Morgan Co., of Cleveland, O.

The Socorro Fire Clay Co.s' plant at Socorro, N. M., will be enlarged, as they feel a need for increasing their daily output.

The Los Angeles (Cal.) Stoneware Co. are in the market for a quantity of flower pots, and will be pleased to receive quotations.

L. T. Irish and Jno. Hart contemplate going into the brick business at Pine Island, Minn. They expect to make 1,000,000 brick this season.

There is a brick famine at Cheboygan, Mich. Henry Todd is authority for the statement that there is great need of another brick plant.

The flower pot factory of E. C. Ward at Alexandria, Ind., was destroyed by fire the latter part of February. Mr. Ward places his loss at $1,500.

Mr. Wm. Harrison, of Cleveland, O., has added a Martin, style "A," machine, illustrated on page 216 of the February CLAY-WORKER, to his plant.

The Providence (Ky.) Brick Co. recently filed articles of incorporation. N. R. Gaines and Geo. A. Cox are incorporators. The capital stock is $5,000.

The Standard Brick Co. is the name of a new firm incorporated to manufacture brick at Augusta, Ga. Jno. C. Hagler, and W. T. Field are interested.

We are advised that the Terra Cotta Works at Ottawa, Ill., has been awarded a $7,000 contract for terra cotta and roofing tile for the new union depot at Omaha, Neb.

The plant of the Evansville Brick Co., Evansville, Ind., was badly demolished by a cyclone which swept over that city Feb. 27. The loss to plant is estimated at $10,000.

In a recent letter the Marion (O.) Steam Shovel Co. say: "We are all covered up with orders and are working night and day. This is the kind of 'prosperity' that counts."

The Cliffwood (N. J.) Brick Co. has been incorporated by M. L. and Jas. D. Avery and W. K. Shafto, with a capital stock of $25,000. They will manufacture brick and terra cotta.

The American Encaustic Tiling Co., Zanesville, O., have made arrangements to change their method of burning their ware, and will, in the future, use natural gas instead of coal. Two full car loads of pipe will be used, the sizes of the pipe graduating from eight inches down to a quarter of an inch in diameter. Thirty-four kilns will be fitted up.

The Clifton Tile and Brick Works at Waldron, which was closed last fall on a judgment note, was sold recently to D. A. Beamer, who held a note of $4,500 against the company.

The Ohio gas and gasoline engine is a new and improved motor just on the market. If you are interested, you should send for catalogue. Address Ohio Gas Engine Co., Bucyrus, O.

W. H. Norman, of East Liverpool, O., has purchased the Congo Fire Brick Works at Empire, O. Mr. Norman has not decided whether he will lease the plant or operate it himself.

The employes of the Valentine Brick Co. at Woodbridge, N. J., went out on a strike for higher wages on the 1st inst. Their request was granted and they resumed work the following day.

A. J. Haws, a large fire brick manufacturer, of Johnstown, Pa., died suddenly of heart disease while on a visit to Philadelphia. He had been engaged in the manufacture of fire brick since 1860.

Wm. D. Budd, the veteran brickmaker of Mattawan, N. J., died in that city in his seventy-fifth year. He began making brick in 1849, in which business he was still engaged at the time of his death.

The Attica (N. Y.) Brick and Tile Works will increase the capacity of their plant to 40,000 building brick a day, putting in new clay screens, doubling their rack system and constructing a number of kilns.

The Weatherly (Pa.) Brick Co's. plant has been closed down for a month in order to make some necessary repairs and improvements to enable them to meet the increasing demand for their product.

The employes at the Kloss Brick Works at Belleville, Ill., have gone out on a strike because the managers refused to sign a scale of wages presented by the men. The outcome is awaited with some interest.

The Western Clay Manufacturing Co., at Portland Ore., whose sewer pipe factory has been closed down for repairs since Jan. 1, resumed operations March 1, and will now run full time through the season.

The Warren Brick and Tile Co. is a new firm that will build a brick plant at Warren, O. R. K. Lewis, E. C. Wolcott and Geo. Beach are interested. They expect to begin erecting the buildings in a short time.

The enamel brick works of Wolf & Robinson, at Freeport, Pa., were damaged to the extent of $5,000 by fire recently, which caught from an adjoining building. They carried insurance to the amount of $2,000.

L. H. Howe and M. C. Butnam will establish a brick plant at Albuquerque, N. M. They expect to equip the plant with modern machinery and appliances, and to make the brick works up-to-date in every respect.

The Fernholtz Brick Machinery Co. has filed articles of incorporation at St. Louis, Mo., with a capital stock of $20,000, all paid in. The stockholders are W. H. Fizer, Wm. F. Scott, E. H. Wangelin and E. and W. L. Rodgers.

The Hawkes Brick Co. has been incorporated at Portland, Me., with a capital stock of $10,000. The officers are: President, Arthur W. Merrill; treasurer, Wm. M. Lamb; directors, A. W. Merrill, R. D. Woodman and A. L. Hawkes.

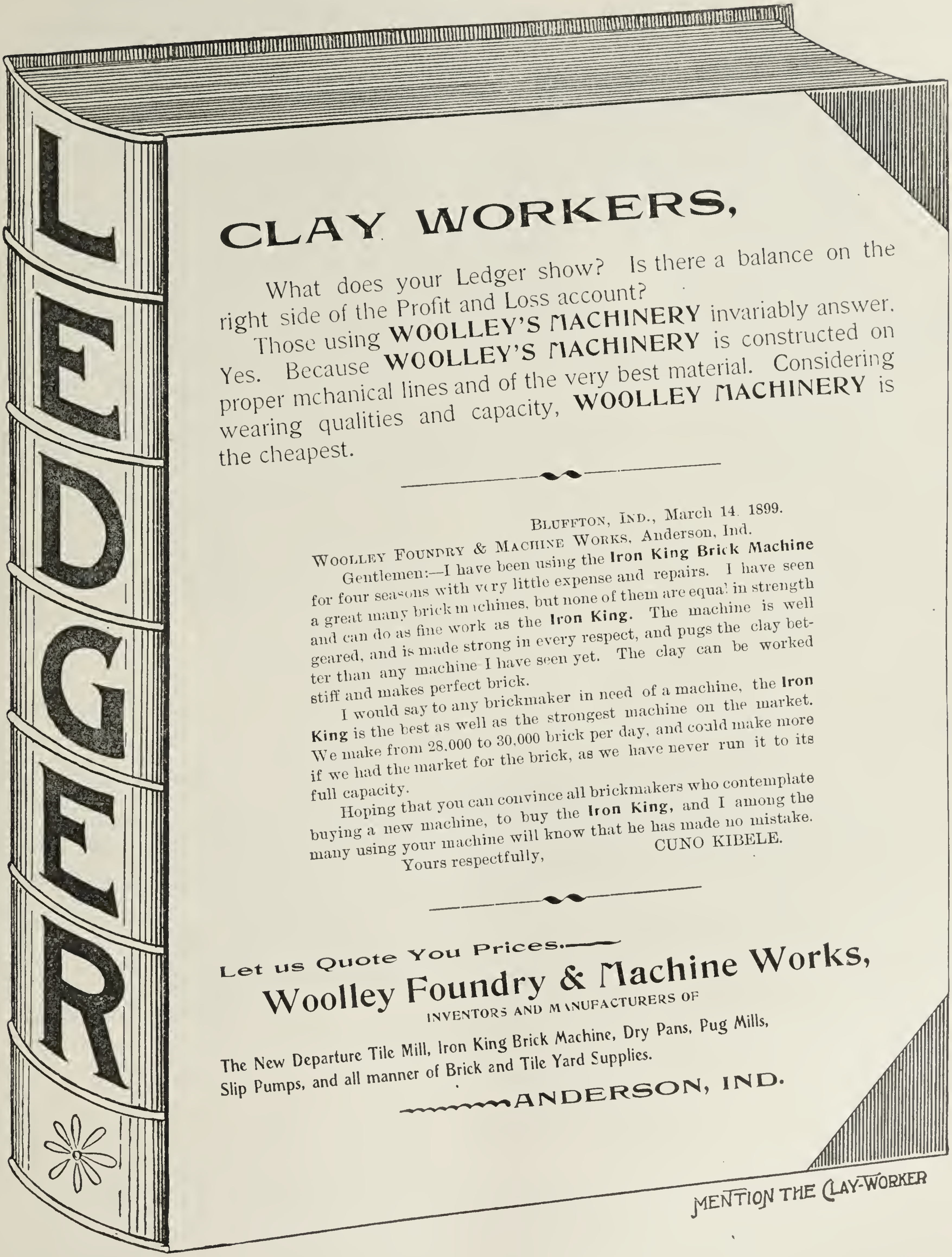
Preparations are being made at the Eastern Paving Brick Co.'s plant at Catskill, N. Y., to operate the plant up to its fullest capacity, beginning with the spring season. They have orders enough on hand to keep them busy for some time to come.

H. Roberts, of Scranton, Pa., writes that he has tested some fire clay for parties in Philadelphia, and found that it makes a splendid fire brick. Mr. Roberts says a fortune can be made out of this fire clay if the money can only be had to push it.

A. D. Thompson, city engineer of Peoria, Ill., and George and E. S. Easton, of the same place, have purchased the Spurck Street Paving Brick Co.'s plant at Peoria. The new company has plenty of capital and expect to make a number of improvements.

Beston & Kelley will greatly improve their brick plant at Chicopee, Mass., putting in a dryer, an additional boiler and engine, and building a couple of kilns. These additions will necessitate almost the entire rearrangement of the plant.

[CONTINUED ON PAGE 290.]



CLAY WORKERS,

What does your Ledger show? Is there a balance on the right side of the Profit and Loss account?

Those using **WOOLLEY'S MACHINERY** invariably answer. Yes. Because **WOOLLEY'S MACHINERY** is constructed on proper mchanical lines and of the very best material. Considering wearing qualities and capacity, **WOOLLEY MACHINERY** is the cheapest.

BLUFFTON, IND., March 14. 1899.

WOOLLEY FOUNDRY & MACHINE WORKS, Anderson, Ind.

Gentlemen:—I have been using the **Iron King Brick Machine** for four seasons with very little expense and repairs. I have seen a great many brick machines, but none of them are equal in strength and can do as fine work as the **Iron King.** The machine is well geared, and is made strong in every respect, and pugs the clay better than any machine I have seen yet. The clay can be worked stiff and makes perfect brick.

I would say to any brickmaker in need of a machine, the **Iron King** is the best as well as the strongest machine on the market. We make from 28,000 to 30,000 brick per day, and could make more if we had the market for the brick, as we have never run it to its full capacity.

Hoping that you can convince all brickmakers who contemplate buying a new machine, to buy the **Iron King,** and I among the many using your machine will know that he has made no mistake.

Yours respectfully, CUNO KIBELE.

Let us Quote You Prices.

Woolley Foundry & Machine Works,

INVENTORS AND MANUFACTURERS OF

The New Departure Tile Mill, Iron King Brick Machine, Dry Pans, Pug Mills, Slip Pumps, and all manner of Brick and Tile Yard Supplies.

ANDERSON, IND.

MENTION THE CLAY-WORKER

EDITORIAL NOTES AND CLIPPINGS—Continued.

They expect to have the work completed by the first of May, when they will be able to turn out more than double their present capacity.

The Central Berkshire Co., of St. Lee, Mass., reported in the February number of THE CLAY-WORKER, have concluded that the Martin machinery will give them the best results, and accordingly placed their order for a complete outfit of the most modern machinery.

F. C. Todd has purchased the Lankfort-Slemmons brick plant at Salisbury, Md. He will put in new machinery and will remodel the plant, arranging for the manufacture of tile as well as brick. The plant, when finished, will have a capacity of 30,000 brick per day.

Hugh O'Brien, who already operates one of the largest brickyards in Bangor, Me., has leased the yard formerly run by the late A. H. Gould. There is every prospect for a good demand for brick the coming season, and Mr. O'Brien will be prepared to get his full share of the trade.

Frank P. Milburn, president of the Milburn Brick Co., writes that that firm will start a new brick plant at Charlotte, N. C., with a capacity of 30,000 to 50,000 per day. He says they will want a lot of new machinery, and that he will be glad to receive catalogues, price lists, etc.

The Minneapolis (Minn.) Board of Trade has become interested in Coon Creek clay, and have made arrangements to have a car load of the clay tested and made into paving brick. If the test proves successful they will at once take steps for the establishment of a paving brick plant.

Clay of a superior quality has been discovered on the grounds of E. H. Flick, Altoona, Pa. Mr. Flick offers three acres free for the erection of a brick and terra cotta plant, and says he will give reasonable terms on the clay in order to encourage clayworking establishments. There is a good home market for brick, both builders and pavers.

The export business in the line of brick machinery has been most gratifying for the past three months, and we understand that that enterprising firm, the Henry Martin Brick Machine Manufacturing Co., of Lancaster, Pa., have just made shipment of complete outfits of their latest improved machinery to Russia, Germany and Japan. and expect, very shortly, to make shipments to Mexico and to England.

The Horton Manufacturing Co., Painesville, O., has just completed one large shipment to Mexico and one to Ottawa, Canada. They have also put in a second large Hercules machine in the Standard Brick Company's plant at Cleveland, O., and one at Brush Bros.' plant at Buffalo, N. Y. They say their shops are running to their fullest capacity in their endeavor to meet the increased demand.

The Henry Martin Brick Machine Manufacturing Co., of Lancaster, Penn., report business for this year to be of a most encouraging nature, and have every reason to believe that the results of 1899 will be all that could be expected. Among the recent sales that this well-known firm has made within the past month has been a complete outfit of the latest improved style "A" machinery, with pug mills, etc., to the Wolfe Brick Company at Detroit, Mich.

The death of A. H. Gould, of Brewer, Me., who was not only known in Brewer and vicinity but all over the State of Maine as a large brick manufacturer, occurred Feb. 25. He had been ill only a short time. Mr. Gould was sixty-nine years old and had been engaged in the brick business in Brewer since 1860. He was prominent in all the commercial and social features of his city and will be sadly missed in the community. He leaves a widow and one child.

Stephen D. Roeder, an old and highly esteemed citizen of Siegfried, Pa., died at his home in that city on the 1st inst. Mr. Roeder was one of the first brick manufacturers in that section, having first engaged in the business in 1872. At the time of his death he was operating a plant at Bethlehem, Pa., as well as the one at Siegfried, although in his eighty-third year. A local paper says of him: "He was loved and highly respected by all with whom he came in contact, and the community suffers a great loss."

The clay lands belonging to the Meeker estate and known as the Meeker-Sharp property, situated in the Woodbridge, N. J., clay mining districts, is now controlled, and will promptly be put in mining operation, by the well-known clay mining firm of P. L. Ryan, of this place. The lands are joining the mining properties of Henry Maurer & Son and Valentines, both well known fire brick manufacturers, and also joining lands of W. H. Cutter, well known in the clay shipping circles. Mr. Ryan states he has in this new development high grades of fire brick, stove lining and yellow ware clays, with a splendid grade of No. 1 seggar clay. Mr. Ryan reports business very good, and this addition to his already extensive clay mining interests will enable him to fully cope with the largely increased trade which he is now enjoying.

Elcy Null, a fourteen-year-old boy employed at the brick plant of the Hydraulic Brick Works on King's Highway, St. Louis, Mo., met with a serious and, perhaps, fatal, accident a few days since. He was standing near the shaft when his coat was twisted upon the whirring cylinder, and he was whirled round with the shafting until the engineer, hearing a peculiar noise, discovered the boy and stopped the machinery. It is feared the boy cannot recover, as he was injured internally. He was the only support of his widowed mother.

In a recent letter J. H. Chambers, of Chambers Bros. Co., Philadelphia, Pa., writes that during a visit to Baltimore, where his company is making some improvements in existing yards, he was informed that the outlook for the brick business there was much better than it has been for two or three years past, there already being inquiries on the market for about 25,000,000 hard brick. It is thought better prices are assured, whether the so-called "brick trust" is consummated or not. Mr. Chambers also says they recently shipped another large double-die brick repress, and that business with them is good.

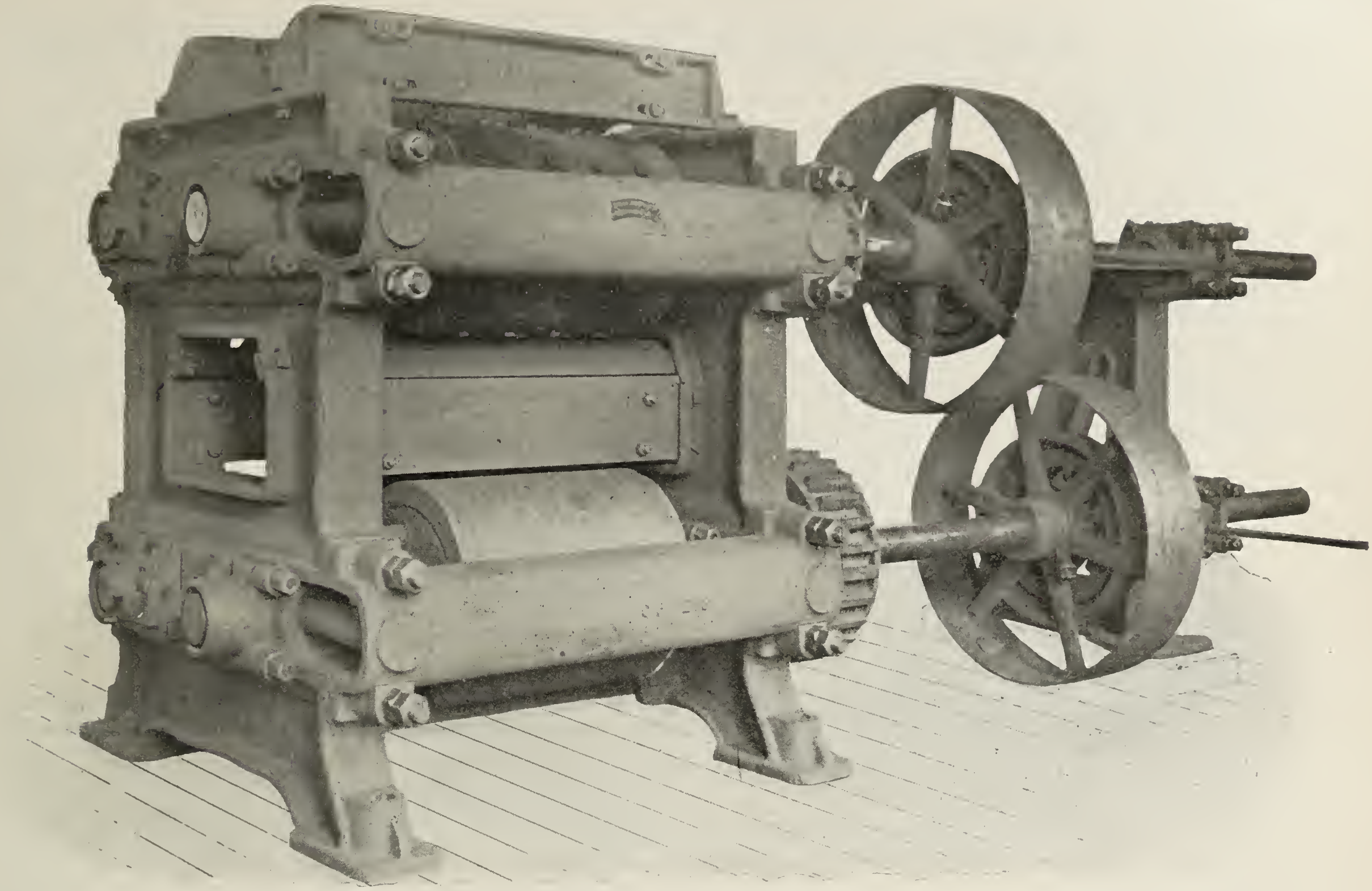
The Reese-Hammond Fire Brick Co., Bolivar, Pa., advise us that they are running their four plants to full capacity, and have voluntarily granted their men an advance in wages varying from 50 per cent. to 20 per cent., to take effect April 1. This advance will affect about 250 employes, and is due principally to the fact that the price on coke oven brick and some furnace brick has been advanced $2 to $3 per thousand. They are building new kilns and increasing the capacity of the No. 4 plant, which was only built last year, the original intention being that this plant should have a daily capacity of 100,000 brick. They have not reached that mark so far, but are improving the plant with that idea in view.

The certificate of incorporation of the American Brick Co. was filed in the office of the Secretary of State at Trenton, N. J., March 2. The capital is $10,000,000. The company will begin business with $25,000 paid in, and it is understood that the bulk of the stock will be used to acquire all of the larger brick manufacturing plants along the Hudson river and the immediate vicinity of New York. The principal promoter is Oakleigh Thorne, who, it is understood, has placed all of the stock of the company not taken by the vendors with several substantial financial interests in New York. The plants acquired turn out over a billion bricks a year, and supply New York with practically all of the building material of that character.

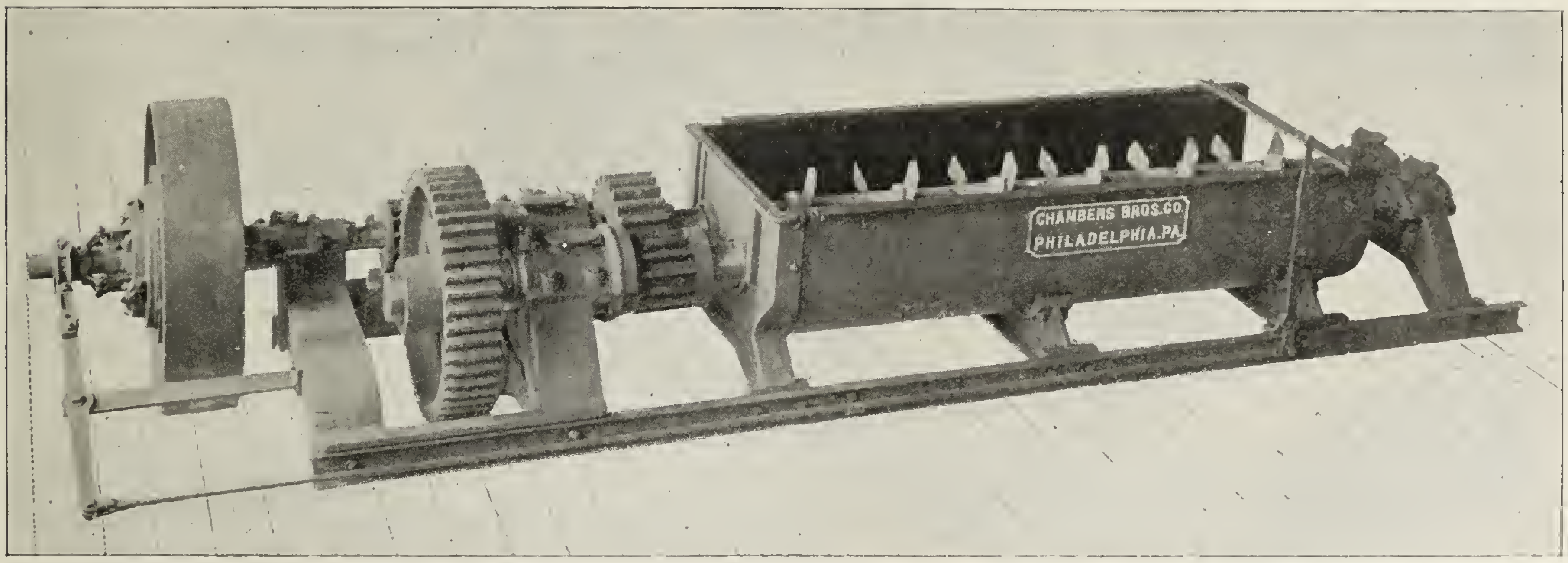
P. S. Kempton, a well-known brick and tile manufacturer of northern Illinois, died at his home in Adams, that State, Feb. 28, of blood poisoning. Mr. Kempton injured his left knee some two weeks prior to his death while loading tile. He treated the injury at first himself, until the pain became so great he consulted a physician, but it was too late, as the blood poisoning had then set in and he died in a short time. Mr. Kempton had formerly lived in Streator, to which place the body was taken for interment. Mr. Kempton was the author of a paper entitled "The Utility of Drain Tile," which was read at the convention of the Illinois Clayworkers' Association held in Streator, and which was so highly thought of that it was issued in pamphlet form for distribution by the manufacturers. Mr. Kempton had a large circle of friends who will mourn his death. He leaves a wife and two children.

PULLMAN.

The dream of the late George Pullman of establishing a model industrial town will soon become a thing of the past, as the model town of Pullman, Ill., will soon lose its peculiar identity and will become a free community, and the anomaly of a city within a city is now at an end. The Pullman Palace Car Company has accepted the decision of the Supreme Court of Illinois, sustaining the contention of the Attorney-General, and the terms of the decree are now being prepared. This decree will divorce the great corporation from everything save the business of building cars. The churches, schools, hotels, arcade, market house, public library, and some 2,000 brick residences will have to be sold to the highest bidder, and the brick works will pass from the control of the company and the streets themselves will now be controlled by the authorities of the city of Chicago. Preference will be given to employes in purchasing the homes which they now occupy.



The CHAMBERS COMPOUND CLAY ROLL CRUSHERS.



The CHAMBERS DOUBLE=SHAFT HORIZONTAL MIXING MACHINE.

This mill is shown with open top, but is so designed that the top may be covered, say one-half or two-thirds of the distance back from the discharge end. It is a double-geared machine, with all bearings outside the tub and away from the material to be worked.

It has two 5-inch diameter shafts, carrying 48 steel knives—24 in each shaft—so secured that they can be set at any desired angle.

In these two machines we offer a most excellent combination for the preparation of Stubborn plastic clays. For particulars address

CHAMBERS BROTHERS CO., Philadelphia, Pa.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED — Competent first-class man to take charge of dry press plant; must be thorough in all branches of brick making. Address
STEADY JOB,
3 1 d Care Clay-Worker.

FOR SALE — Several second-hand chain hoists, from 2 to 8 tons capacity; also several engine lathes, boilers, engines, pumps, etc. Address CLEVELAND,
3 tf d Care Clay-Worker.

POSITION WANTED — Enameler will be open May 1 to take charge of enameling plant; practical proof of ability given; only firms of the highest standard need apply.
WEDGWOOD,
3 1 e m Care Clay-Worker.

WANTED — Position as foreman or burner; I understand fire brick, shale, stiff and soft mud, dry press, up or down draft kiln; 28 years' experience; A-1 references. Address
H. P.,
3 1 d Care Clay-Worker.

WANTED — A position by a brickyard millwright and machinist, with some good firm, to set up and start new machinery, or would accept a position in the shop or on the road; forty years of age and reliable. Address J. S. M.,
Care Clay-Worker.

FOR SALE — One Old Reliable soft mud brick machine, geared for steam, with six molds, bump and dump tables, sand and water boxes; the outfit is in good repair, and will be sold very cheap. Address
"CRAWFORD,"
3 3 d Care Clay-Worker.

FOR SALE—No. 5 Brewer Tile Machine; in good order. Tile dies 3 to 10 inches. Side cut brick die. Very cheap.
1 3 e WM. STARE, Mendota, Ill.

WANTED — A dry pan, new or second hand, ready to start; mail description and spot cash price E. J. BURKE,
2 tf d Rochester, N. Y.

WANTED — A good reliable brick and tile maker and burner, by the thousand; everything furnished but the labor. Address
2 2 dw WARREN, care Clay-Worker.

WANTED — Situation as superintendent or assistant by man who understands the making and burning of enamels, either in pottery or brick works. Address N. J.,
3 1 c care Clay-Worker.

FOR SALE — Ross-Keller 6-mould dry press; Creager mud machine; 125 H. P. engine; two 70 H. P. boilers; dry pan; pulleys, belting; blacksmith outfit; trucks, pallets, fire brick; 4 ft. grate bars; pump. Used little.
GEORGE MATHERS,
2 3 e 960 Nassau St., Cincinnati, Ohio.

FOR SALE—At a bargain, the tile factory at Idaville, Ind., equipped with one Brewer tile mill, large engine and boiler. Building large, one and one-half stories high and an 18 foot down draft kiln; 4½ acres of fine clay. Clay cars on steel rails. This factory is for sale on account of the death of the proprietor. For further particulars address
MRS. MARY OWENS,
3 1 dm Chalmers, Ind.

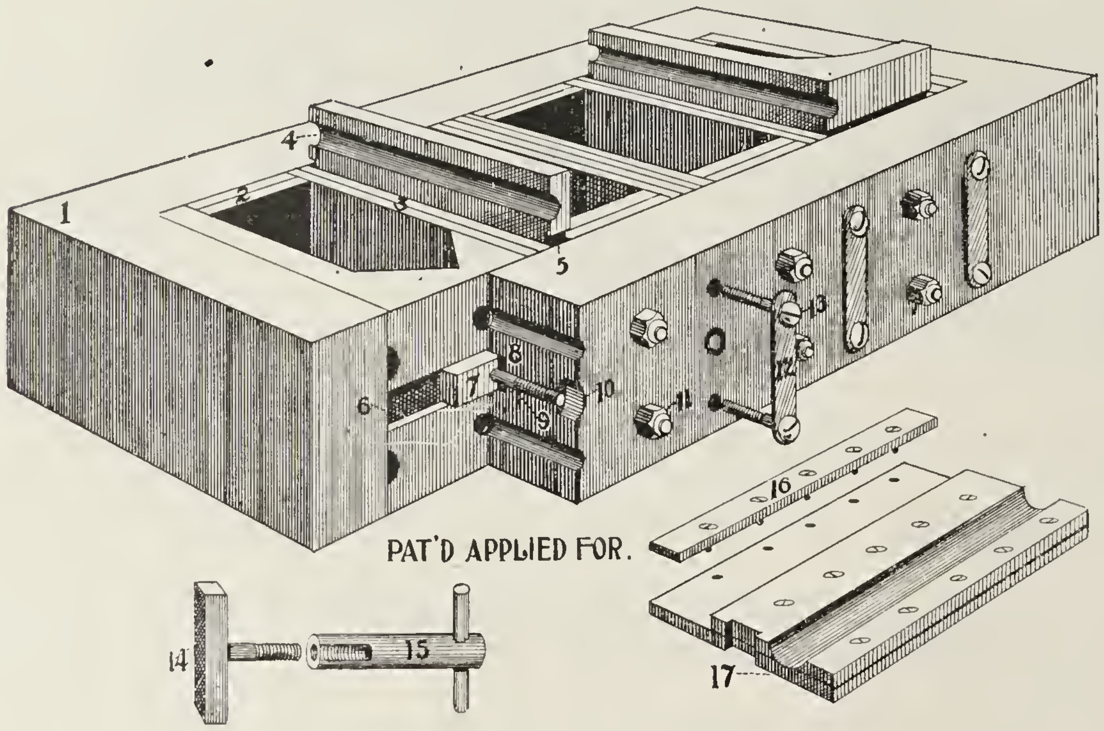
FOR SALE CHEAP.

A Good Dry Press Brick Machine, in good running order, will be sold for less than half first cost. Its all right and a bargain. Have changed to Stiff Clay Process. Address

"SECOND HAND,"
1 tf d **care Clay-Worker.**

Mention the Clay-Worker,
When writing to Advertisers
Mention the Clay-Worker

BRICK MOULD LINERS.



THE only Reliable System of Adjustable Hard Steel Liners and Shape Moulds in existence. Can be adjusted to suit any Dry Press Machine.

Patent Adjustable Liners and Ornamental Moulds of all Description.

Arch Brick, Sizing Machines and Patent Automatic Liner Grinders.

Ervin Special Machine and Tool Co.,

25-27 Champlain St. *CLEVELAND, OHIO.*

The Repress that Gives Entire Satisfaction.

Chattanooga, Tenn.

Ohio Ceramic Engineering Co.,

Gentlemen:—We beg to advise you that we are very well pleased with the three Represses purchased from you, and that they are doing our work in a manner entirely satisfactory to us.

Yours truly,
TENNESSEE PAVING BRICK CO.

Cumberland, Md.

Ohio Ceramic Engineering Co.

Gentlemen:—We have two of your Represses in operation at Washington, and will state that we find them to be everything that you claimed them to be. We have no hesitation in recommending your presses to any who are in need of such machinery.

Respectfully yours,
J. F. MERTEN'S SONS.

Reading, Penn.

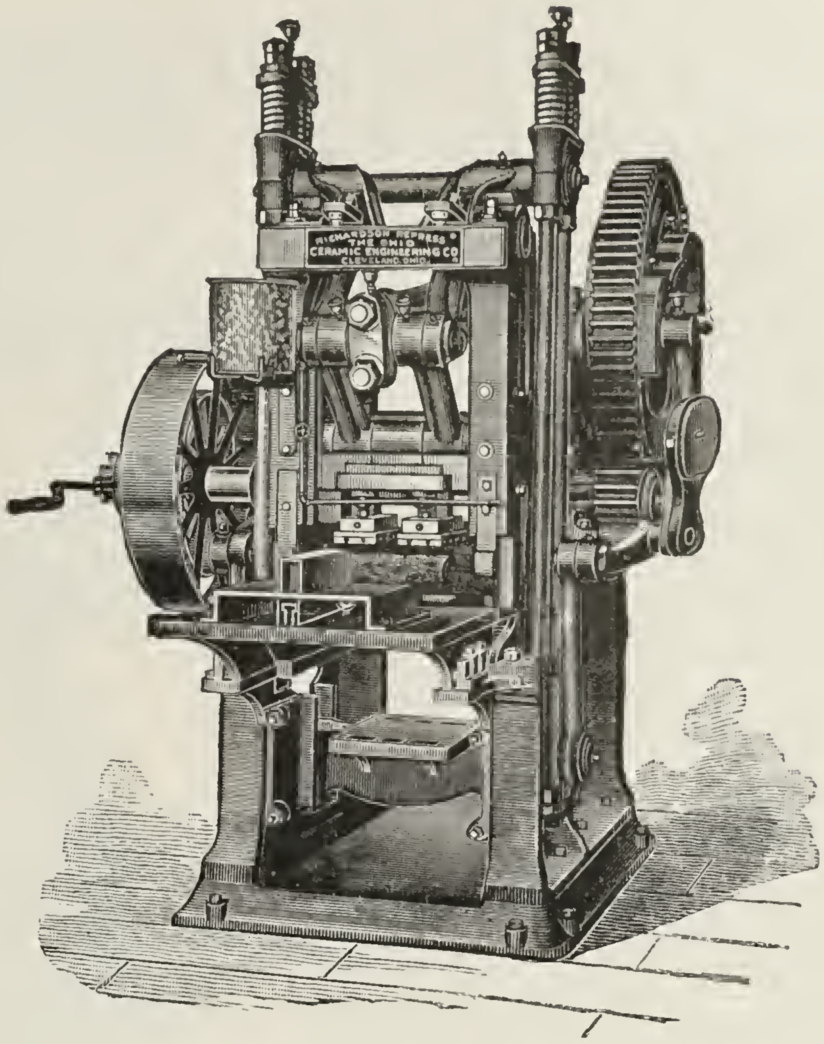
Ohio Ceramic Engineering Co.

Gentlemen:—The Richardson Repress which we purchased of you has been working continually for the past year. It is giving us entire satisfaction, and is doing its work promptly, with little or no repairs. We can safely recommend this press to anyone who may be in need of this class of machinery.

Yours truly,
MONTELLO CLAY & BRICK CO.

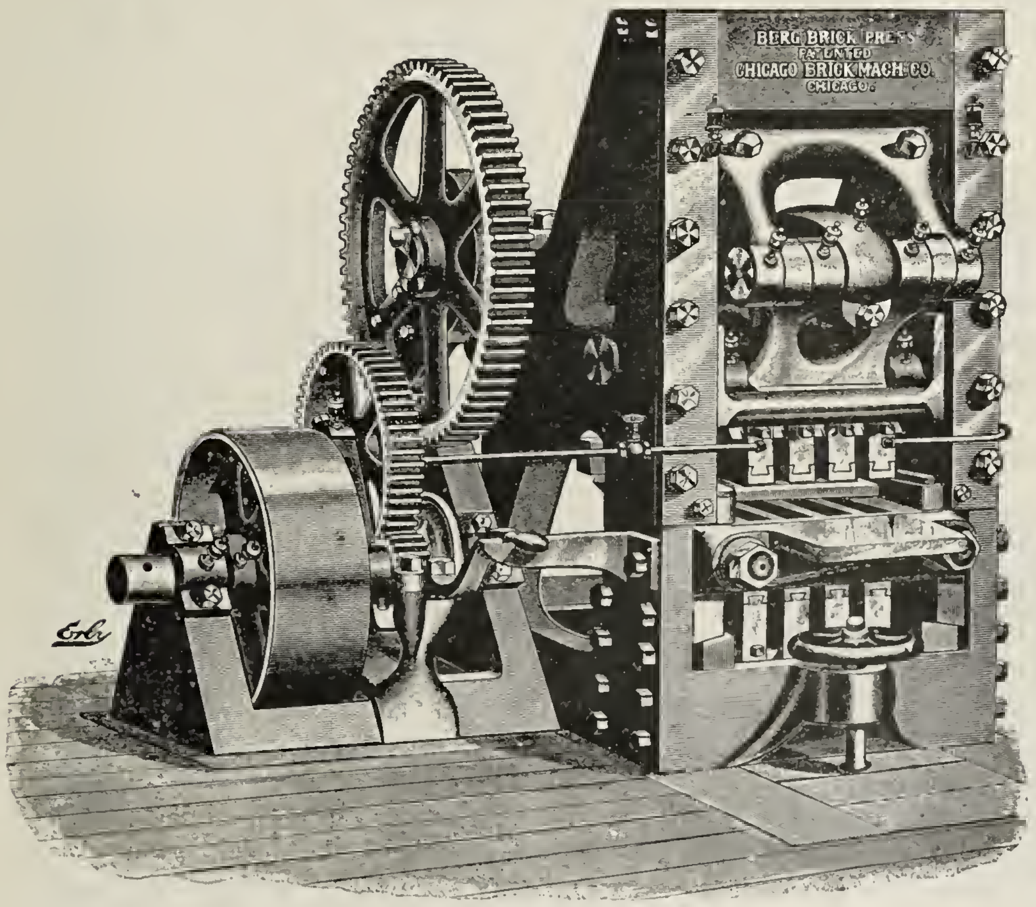
YOU SHOULD PROFIT BY THE EXPERIENCE OF OTHERS. SEND FOR CATALOGUE.

The OHIO CERAMIC ENGINEERING CO., CLEVELAND, OHIO.



THE RICHARDSON REPRESS.

Up-to-Date Machinery.



OUR **BERG BRICK PRESS** is the Most Modern in design and construction of all Dry Press Machines. Simplest, Strongest and most Durable.

It has three distinct pressures and an unequalled Mold Box. Absolutely unbreakable and fully guaranteed. Circular on application.

Our line of **Stiff Clay** and **Soft Clay Machinery** is also strictly **Up-to-Date.** All the latest improvements and most convenient devices.

Send for new 1899 catalogues.

CHICAGO BRICK MACHINERY CO.,
225 DEARBORN STREET.

FOR SALE — One Brewer clay crusher. with stone separating roller; used some, but in fairly good order; also one Arnold revolving dump table, good as new; only used two days. Address "WALTON,"
3 1 d Care Clay-Worker.

POSITION WANTED — By an experienced man, capable of taking full charge of fire or other brick plant, including paving, common, front and hollow brick, tile pipe, etc.; up, down, continuous and other kilns. Address S. G. P.,
3 1 c m Care Clay-Worker.

WANTED — A practical party with capital to take interest in a new roofing tile plant, or will sell cheap outright; abundance of material that burns a beautiful cherry red.
ZANESVILLE ROOFING TILE CO.,
3 1 c Zanesville, O.

WANTED — Position as superintendent or burner, by one who is thoroughly practical in every department of manufacturing dry pressed or mud brick, and is well acquainted with up-to-date methods; No. 1 reference given. Address ST. LOUIS,
3 1 dm Care Clay-Worker.

FOR SALE — Second-hand brick machinery of all kinds, very cheap; brick machines, cutting tables, pugmills, represses, screens, etc.; will give some great bargains in this class of machinery; write us for prices and description of what we have. Address
THE BONNOT CO.,
3 3 d Canton, O.

FOR SALE — To settle an estate, brick plant 1⅜ miles from center of North Adams, Mass.; population over 20,000; Pallet system, new engine, everything modern; capacity a million a month; clay inexhaustible; suitable for common, hollow brick or tile; boarding house, engineer's house and sawmill on yard; brick can be made there cheaper than on most yards; demand will exceed supply. Address
S. P. THAYER,
3 1 dm North Adams, Mass.

A GOOD OPPORTUNITY.

To invest in a ready equipped brick plant, making special styles of impervious face brick, which command good profits; demand exceeds output; located in eastern Ohio, with good shipping facilities. Present owner desires to have more capital used to increase the plant and operate the year round. Address S. B. C.,
3 1 d Care Clay-Worker.

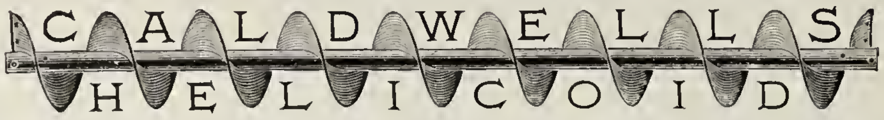
FOR SALE AT A BARGAIN.

One Monarch brick machine, one Wellington mold sanding machine, one Wellington disintegrator, 25 M. capacity; never was run; 35 cherry molds, iron bound, and other equipments that go with soft mud brick machinery; also one Raymond repress, never was used. This machinery is all new, and has made 300,000 brick. It will be sold at a bargain. For further particulars address ROBERT WILSON,
3 1 2.50 m Cadillac, Mich.

BARGAIN IN BRICK MACHINERY.

Having discontinued business, and desiring to quickly close up the company's affairs, we will sell very cheap for cash the following valuable brick machinery: A Columbia dry press brick machine, made in St. Louis; a 4-mold machine, with capacity of 20,000 per day; a Frey-Scheckler auger machine, "Little Giant" No. 2, capacity 30,000 per day; a "Schoelhorn-Albrecht cyclone disintegrator," for dry press work; a roller disintegrator for auger machine; a hand press for ornamental brick. Brick machines are nearly good as new. Machinery at company's plant, in Houston, Tex. Address C. W. HOLL, Secretary Houston Pressed Brick & Tile Co., 206 Main st., Houston, Tex., or C. J. BROWN, Topeka, Kan.
3 1 dm

Conveying, Elevating and Power-Transmitting Machinery.



Specialties for handling Material of all Kinds.

CALDWELL HELICOID CONVEYOR, The only perfect Conveyor with flights of one Continuous Strip of metal without seams or rivets.

Link Belting, Sprocket Wheels, Cotton Belting, Rubber Belting, Leather Belting, Belt Clamps, Elevator Bolts, Elevator Buckets, Concrete Mixers, Friction Clutches, Jaw Clutches, Couplings, Flexible Spouts, Gearing (all kinds), Elevator Boots, Hangers, Perforated Metals, Pillow Blocks, Iron Pulleys, Wood Pulleys, Shafting, Set Collars, Swivel Spouts, Take-up Boxes, Turn Head Spouts, Wire Cloth. Send for catalogue.

H. W. CALDWELL & SON CO., General Machinists, 127, 129, 131, 133 West Wash. St., Chicago.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Thirty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS, Agent and Patentee, 161 Grand Street, Rahway, N. J.

"LEVIATHAN."

"Upon Earth There is not His Like.'

..................................Sept ....1896.
MAIN BELTING CO.,
55 and 57 Market St., Chicago, Ill.

GENTLEMEN:—Please ship us via freight, 146 feet x 18″ 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "**LEVIATHAN.**" Prompt shipment of the above will oblige. Yours very truly,

....

Manufactured under Special Process.
A Guarantee of Superiority.

NOTE.—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

MAIN BELTING COMPANY,

Sole Manufacturers LEVIATHAN BELTING,

55 and 57 Market St., CHICAGO, ILL.

PHILDELPHI: 1219 Carpenter Street. **BOSTON 120 Pearl Street.**

Do Not Make Dry Press Brick

..... WITHOUT .....

The Carmichael CLAY STEAMER.

T. W. CARMICHAEL, Manufacturer, Wellsburg, W. Va.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

••••

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

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Proprietors,

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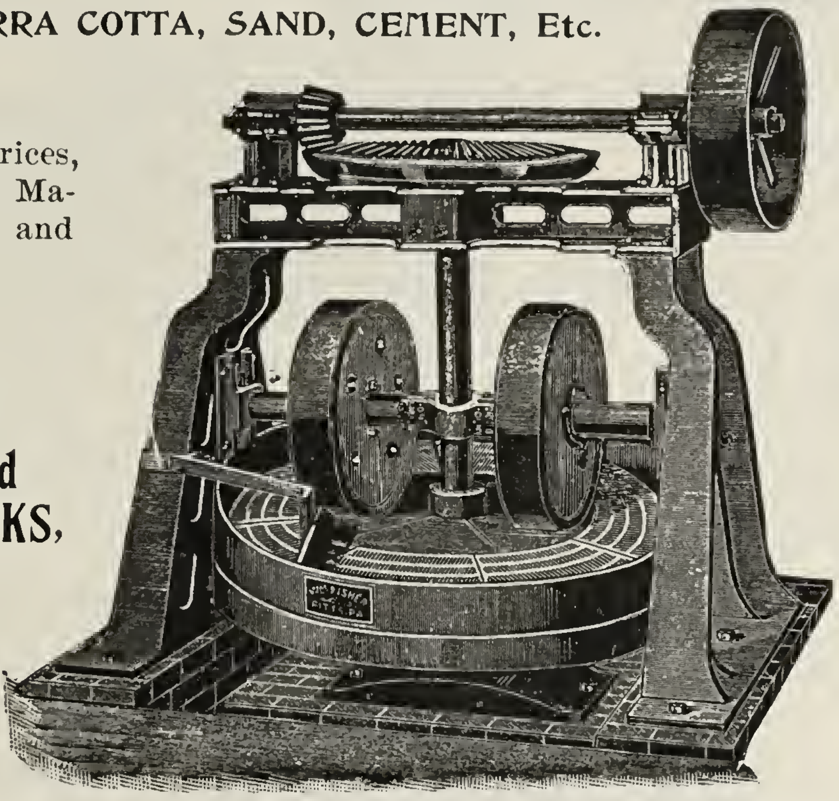

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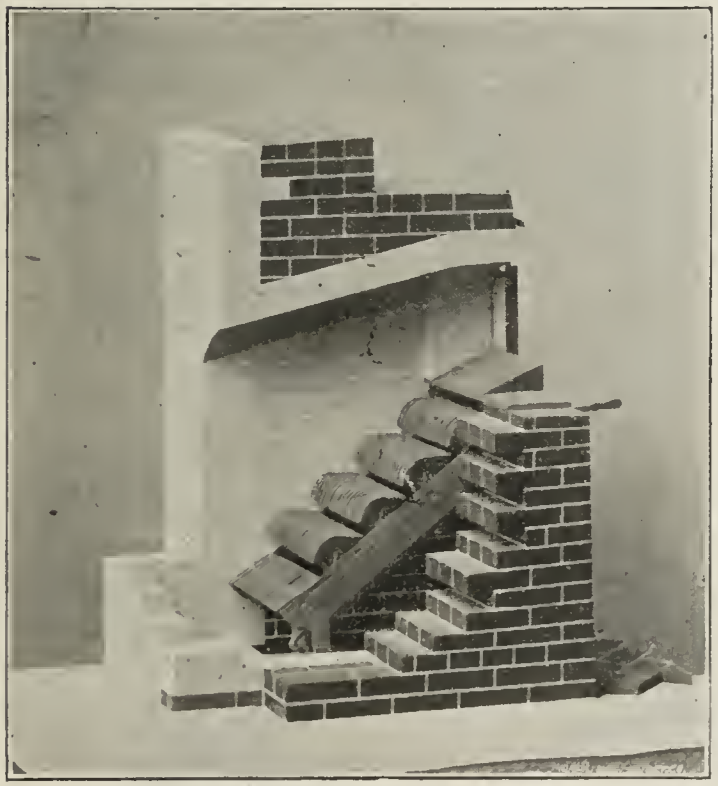
Have more points of superiority than any others on the market. Will be pleased to tell you all about its merits.



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The ALSIP KILN Furnace Grate,

Can be **attached** to any style of **kiln furnace.**

It is a **coal coker** and a **gas generator.**

Is **self cleaning** and has a **gradual feed.**

Is **simple** and **durable.**

Nothing but **coal slack** needed for **fuel.**

Guaranteed to save **labor** and **fuel.**

Investigate and be convinced.

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FOR SALE — 150,000 new and second-handed pine pallets, 32 and 34 inches long, ten wide.
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WANTED — A No. 4, 5 or 6 Alsing pulverizing cylinder; must be in first-class condition. Address
ATLANTA TERRA COTTA CO.,
2 2t d Atlanta, Ga.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — One new Henry Martin Letter A. soft mud brick machine; never had clay in her, and was never used.
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FOR SALE OR LEASE. — Stoneware plant in the middle Trans-Mississippi country; capacity 2,000 gallons per day; demand exceeding capacity; prices good. Address
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FOR SALE—GREAT BARGAIN—Henry Martin "A" Brick Machine, capacity 30,000, very good order; pug mill, crusher, elevator, shafting, etc. $750. All in first-class working order. Good 30 horse power Erie engine and boiler, $400.
1 tf dm BOX 13, care Clay-Worker.

WANTED—Situation as general manager or superintendent of a soft mud, stiff mud or vitrified brick plant, by a man of experience and executive ability. Can erect new plant including round or square down-draft kilns.
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A well equipped Virginia brick plant, near a large city, affording a good market. The present price of common brick is $7 a thousand, Pavers $9 to $10. Abundance of excellent clay and cheap fuel. A splendid opportunity for a practical, industrious man. For full particulars address
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One of the best located and equipped brick yards in the State of Connecticut, situated alongside of railroad, side track to kiln, a dozen of first-class brick markets to ship to: inexhaustible bed of clay of No. 1 quality; clay will make street paving, hollow and first quality common brick; favorable terms to responsible parties; property will bear closest investigation; a rare chance. For particulars address
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We have for sale the following second-hand brick machinery, in good condition, viz.:

One 24-in. Buffalo exhaust fan, good as new.

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Two hand-power represses, in fair condition.

One (1) E. M. Freese & Co. stiff mud machine and cutting table, side cut, 30 M. capacity, in good condition.

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One (1) nine-foot Stevenson dry pan, wood frame.

One (1) Frey Sheckler "Acme" side cut stiff mud brick machine, fair condition.

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FOR SALE —$1,000 CASH—Will buy a brand new two mould Whittaker brick press. Worth $2,500. Address F. D. BROWN,
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NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
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WANTED — Position as superintendent or manager by man of 15 years' experience. Have good position, but on account of bad health of family would like to change.
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75 horse power Westinghouse Engine.
3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
6 spring brick trucks.
Lot shafting, belting and pulleys.
1 Barr Pumping Company steam pump.
All new or little used, and in excellent condition.
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One Monarch machine, only used one short season.
One extra heavy Quaker machine in good order.
One, horse power machine which we will guarantee good as new, was used to test clay, making about 100,000 brick.
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One Eureka Dry Press Brick Machine.
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25,000 yellow pine brick pallets 33x10 inches made of three strips, well cleated together.
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One 1½ yard Marion steam shovel.
Lot of new and second-hand dump cars.
Seven narrow gauge and one standard gauge second-hand locomotives.
One Potts Stock Brick Machine.
One Potts sanding machine.
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Two vertical pug mill, etc.
We manufacture a full line of grinding and mixing pans for brickyards, chemists, smelter, clay pot manufactures, etc. etc.
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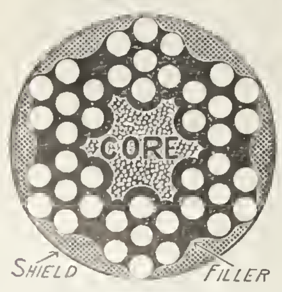

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Wire Ropes,
Manila Ropes,
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INCORPORATED 1870. MANUFACTURERS OF
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Unexcelled for Kiln Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio.

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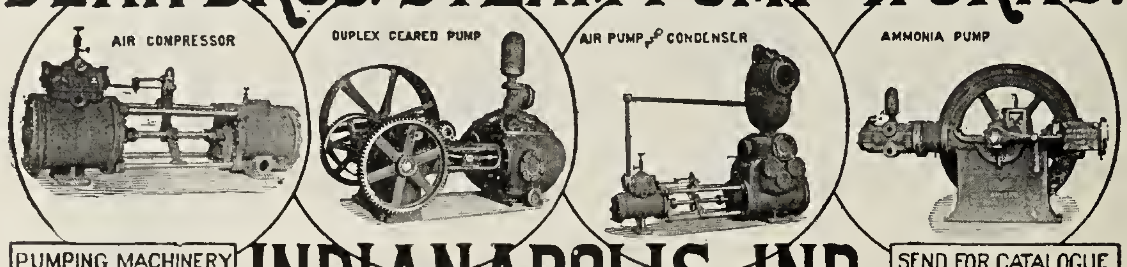

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Get good Pallets from those who know how to make them, It will pay you in the long run. . . . .
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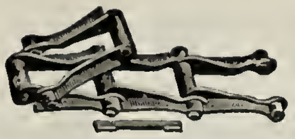
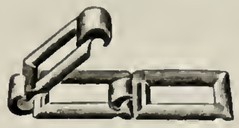


Mey Detachable Chain Belt.



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Approved Appliances for

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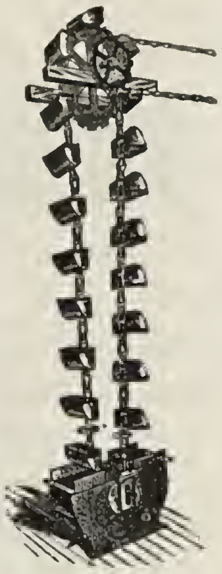


THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to

MEY PATENT CLAY ELEVATOR.

Make Many More Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

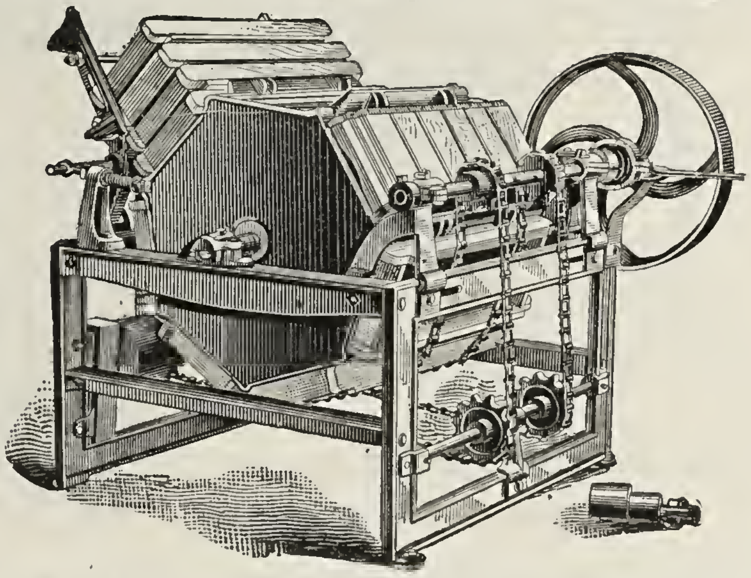
Send for Catalogue

CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

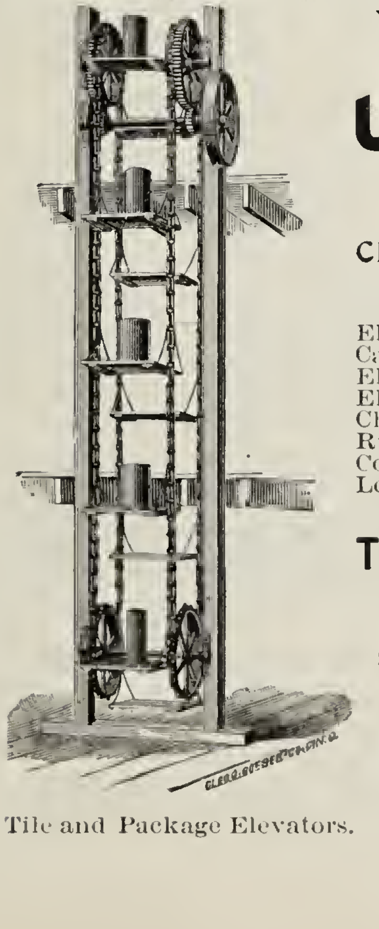
A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been sucessful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.



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Elevating, Conveying and Power-Transmission Machinery,

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Elevator Buckets,
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Elevator Bolts,
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Chains, (all styles).

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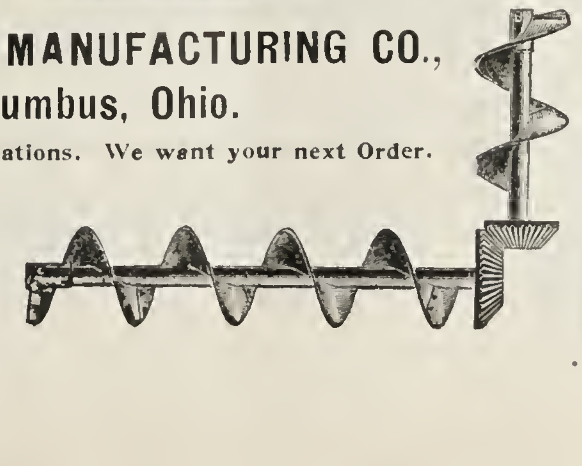

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It largely increases the lubricating value of any oil or grease and saves time and money. Send for free samples and pamphlet.

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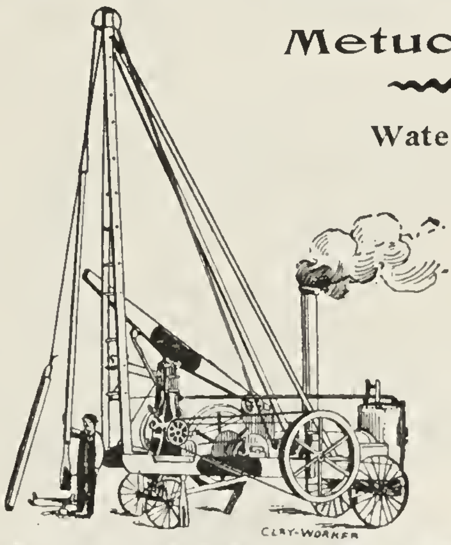

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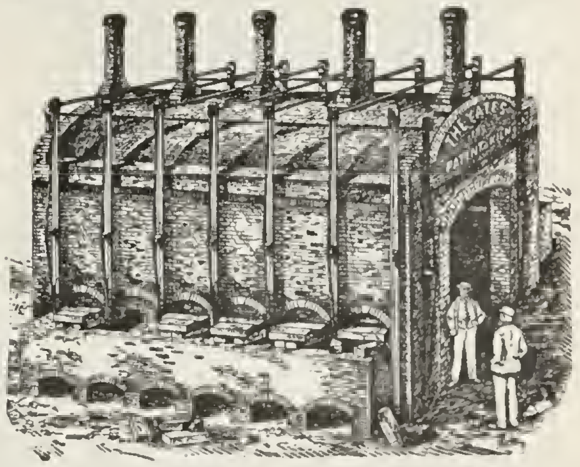

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This kiln has no equal. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns.

Hot air dryer. Continuous and Mufle Kiln.

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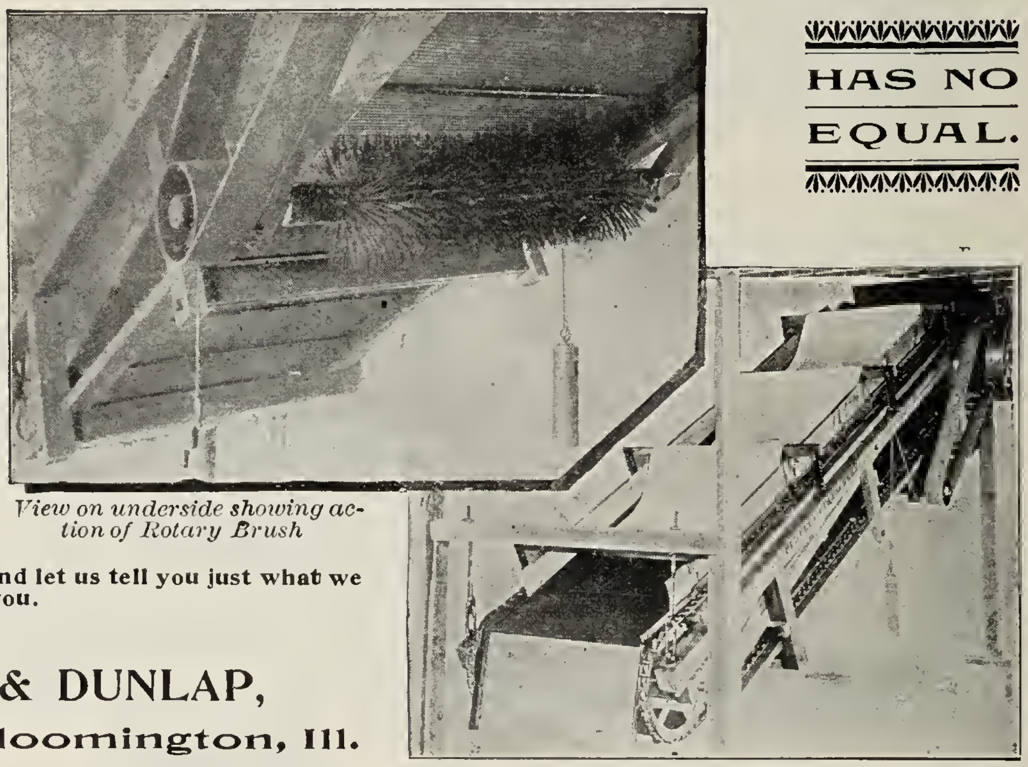
The PERFECT CLAY SCREEN.

This Screen positively Saves one man.
Increases grinding capacity.
Gives a finer grade of clay
Does the work as well in cold weather as in warm.
Screens cold moist clay as well as dry.
It will more than save its cost in one Winter.



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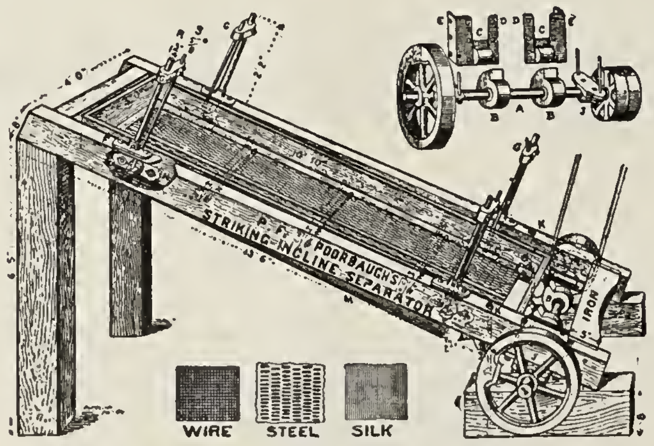

For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.

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These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

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Write for Prices. PITTSBURG, PA.

Mention the CLAY-WORKER,
WHEN WRITING TO ADVERTISERS
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Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

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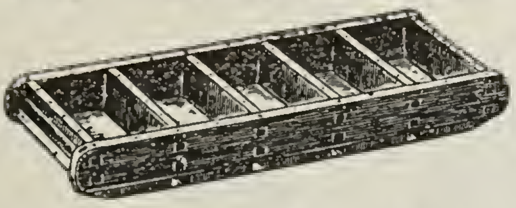

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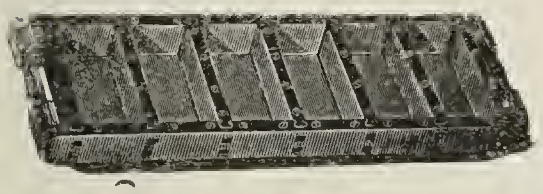
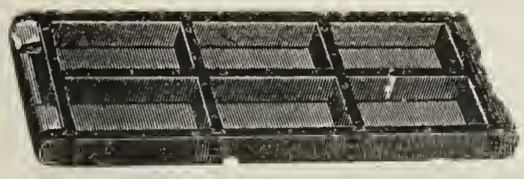
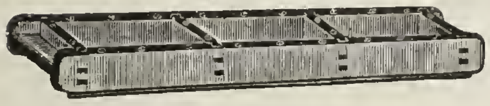


6 Brick Machine Mold.



6 Brick Hand Mold



3 Brick Hand Mold.

NOW Is a good time to look over your stock and see what you will need for the coming season.

Send your orders to "Arnold's" for what you need. You can send the order now and we will have them ready to ship at the time you want them.

You will be sure to get the best there is made and if you want anything special in the line of Moulds, Trucks or Barrows of different designs you can get it made to order here at reasonable prices.

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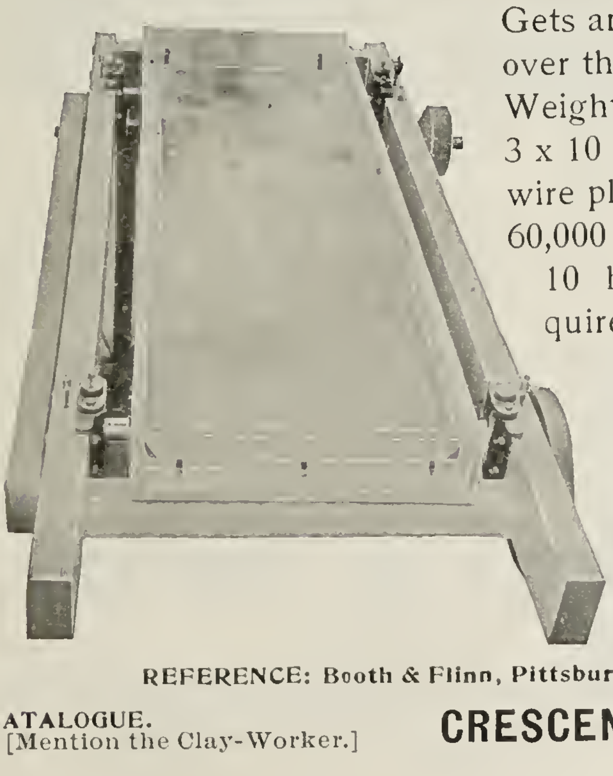
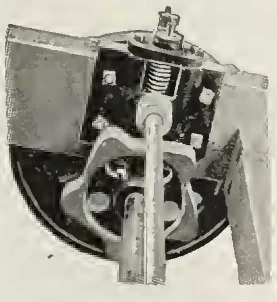


Gets an impulse at each corner—vibrates over the whole plate, on the plate only. Weight, 1,500 pounds; 5 x 14 feet over all, 3 x 10 feet screening area, ⅛-inch mesh wire plate. Screens for 60,000 brick per day of 10 hours. Will require the minimum of attention or repairs. Cost, F. O. B. cars, Shoustown, Pa., $150. Work, fittings and material guaranteed.



The only screen in the world screening 100 mesh Manganese.

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The Henry Martin Brick Machine Mfg. Co.,

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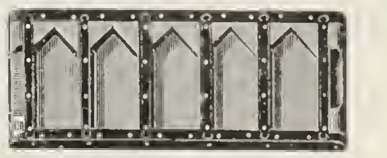
Machine Brick Moulds

a Specialty.



PRICES:

Steel bound machine moulds, 5 or 6 brick	$1.75 each
With Steel Lined Heads, 5 or 6 brick	$2.00 each

With Panel Bottoms, solid, 5 cents per brick extra.

With name plates 5 cents per brick extra.

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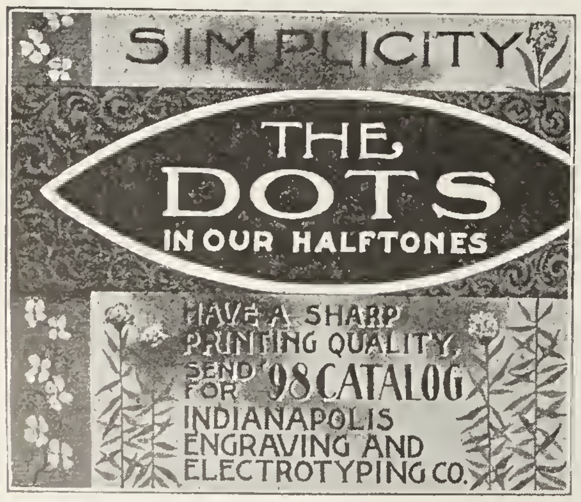

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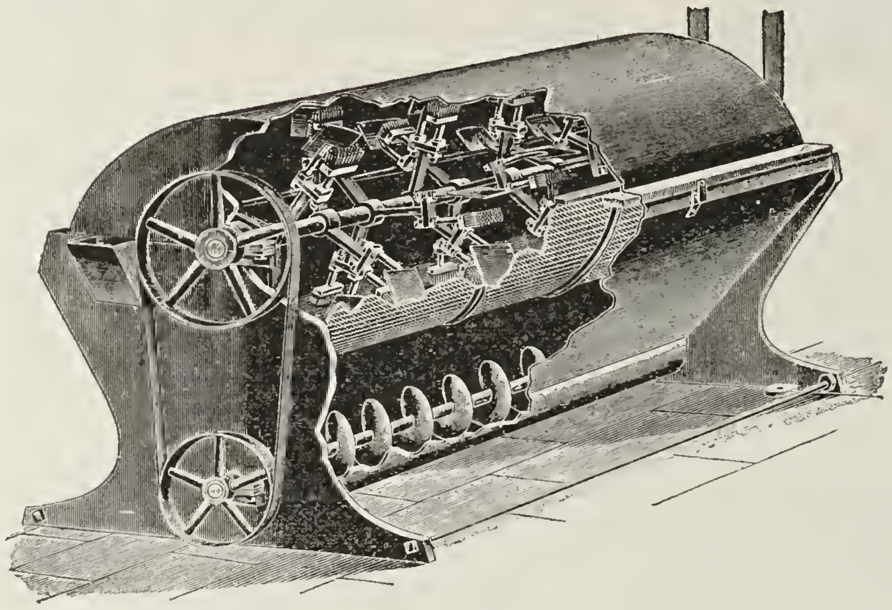

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Capacity unequalled

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KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
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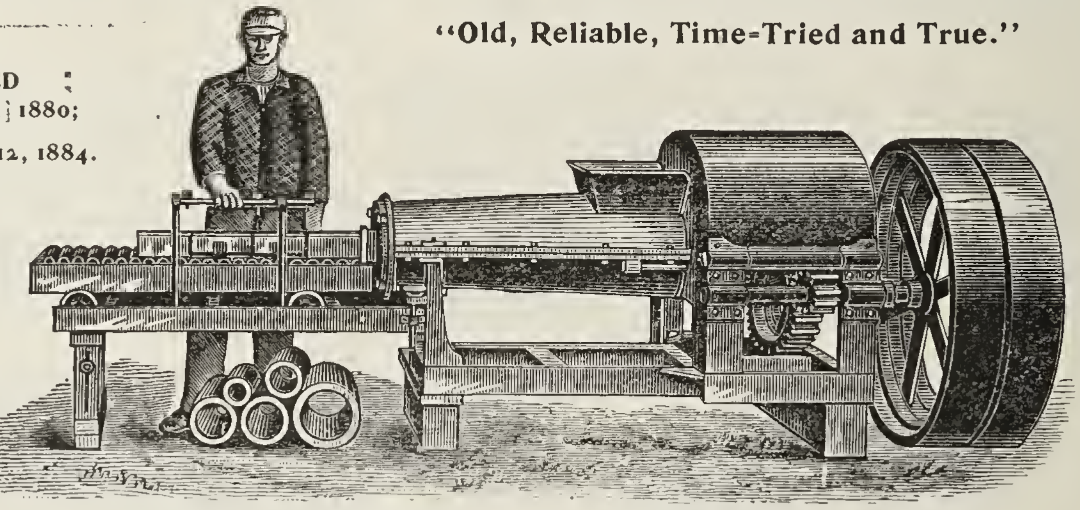

P. H. Kells, the Original Inventor of the Auger Machine

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

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H. C. BAIRD & SON,
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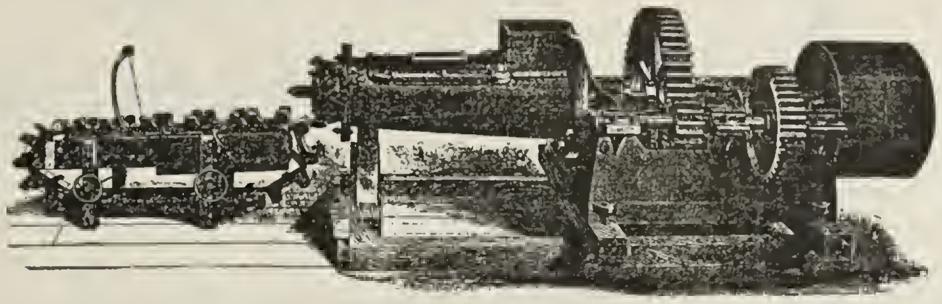
Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers ... of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

The "PEERLESS" UP-DRAFT ....KILN.

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For Burning....
DRY PRESSED,
RE-PRESSED,
ORNAMENTAL or
COMMON BRICK.

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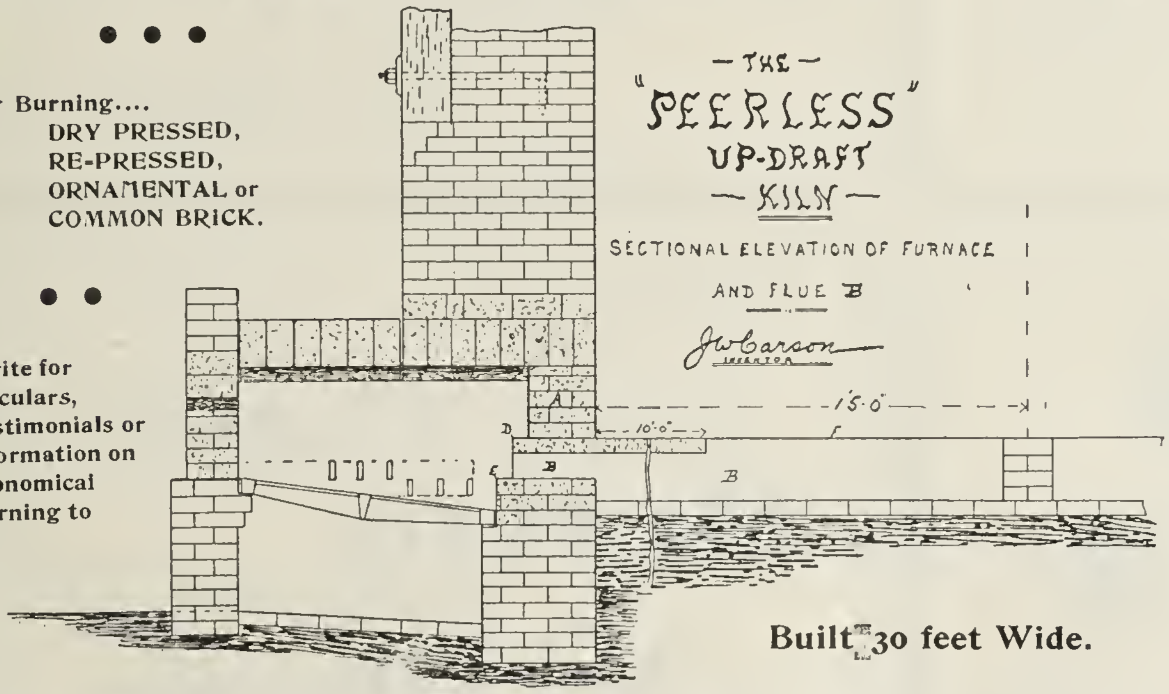
Write for Circulars, Testimonials or Information on Economical Burning to



Built 30 feet Wide.

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I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

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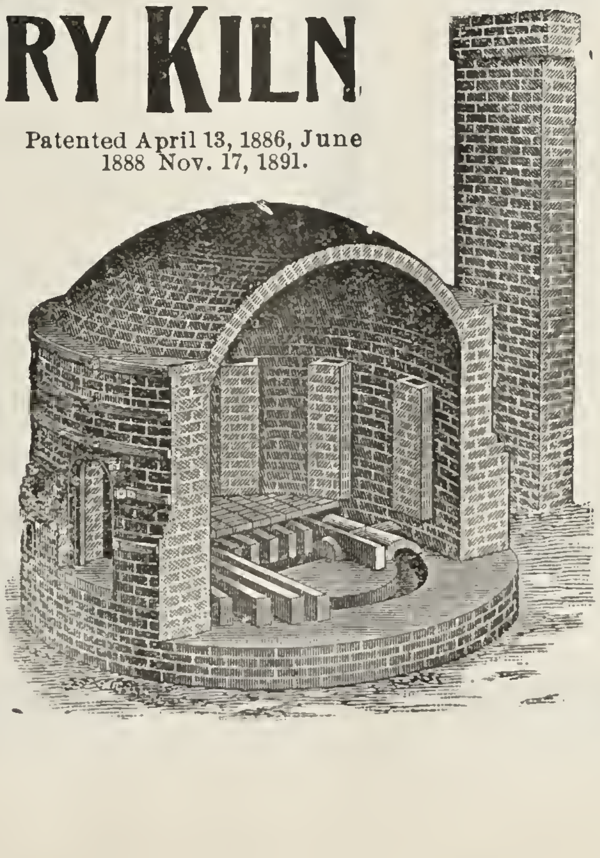

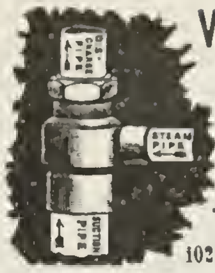

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WEST and SOUTH

run the lines of the Illinois Central Railroad and the Yazoo & Mississippi Valley Railroad, reaching into the eleven States of

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Presenting an unequaled territory for diversified industries, and possessing

**Fine Sites for New Mills,
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To sound industries, substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered Textile Industries in the South by a number of good places. GEORGE C. POWER, Industrial Commissioner I. C. R. R. Co., Chicago.

When Mr. Culver of the

Wabash Clay Company,

of VEEDERSBURG,
INDIANA,

Can find time to prepare his "ad." it will occupy this space. Meantime, if you would know about his Company's material and its splendid merits, write for a list of the Cities and Towns that have used it.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO.,
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HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

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McAvoy Vitrified Brick Co.,

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Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

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DES MOINES, IOWA,

Is operating a plant with a yearly capacity of Thirty Million Paving Brick, with unsurpassed shipping facilities.

Estimates on Brick pavements cheerfully given.

The Clinton Paving and
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Manufacturers of the Highest Quality of

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Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

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The Standard Shale Block for
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Manufactured at Brazil, Ind., by the

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Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

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Four of the largest and best paving brick plants in the world.

**Canton
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Head the list for uniformity, finish and wearing qualities.

Samples sent free on application.

Write for prices.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

On Application this Kiln can now be seen at work burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

This kiln has now been in operation nearly two years, it was guaranteed to burn 25 M per day, at a cost of 25 cents per M with fuel at $2 per ton; I am told it is burning nearly 35 M per day at a cost very much lower than guaranteed.

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MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

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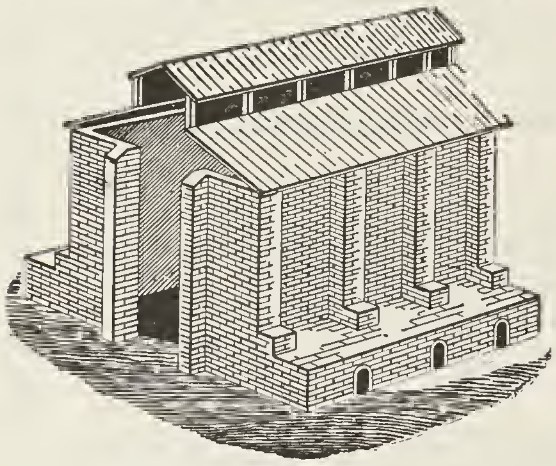
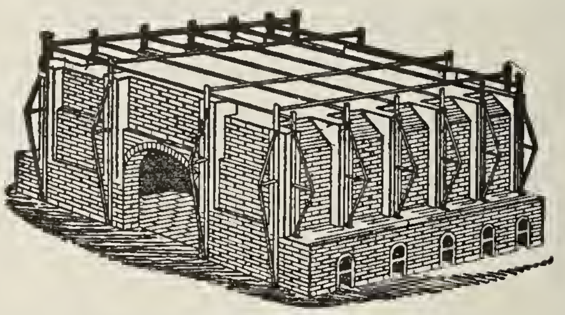
LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Up-Draft Kiln.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

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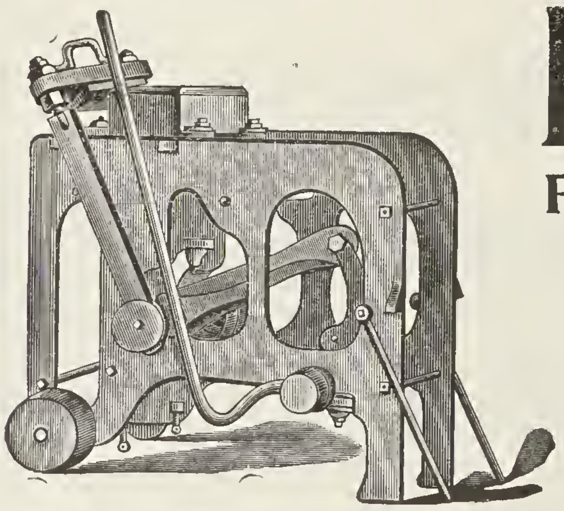
PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



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GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
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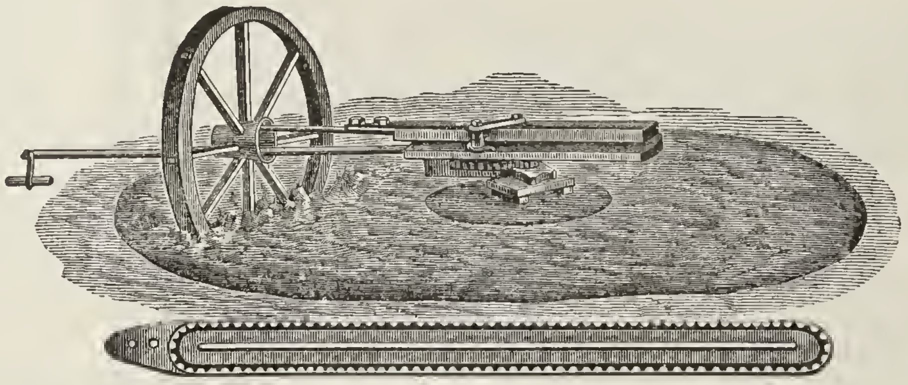
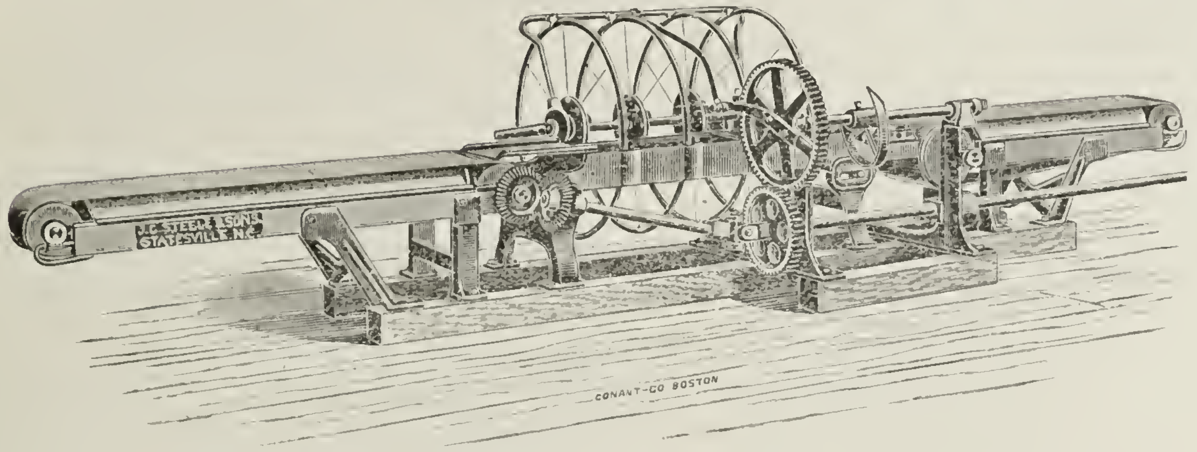


These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Steele Brick Machinery

NO FAILURES. COMPLETE OUTFITS.



Automatic End and Side Cut Table by Changing Cutting Frame.

Lavinia, Ga., September 12th, 1898.
Messrs. J. C. Steele & Sons,
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Gentlemen:—Your favor received, and in reply beg to say that the Steele Brick Machine is as good as I want. Can make 40,000 per day with it. I am more than pleased with the automatic cut-off. Yours truly,
J. H. SEWELL.

Mr. Sewell is using our Xtra Machine with automatic cutting table.

J. C. STEELE & SONS,
Manufacturers of
The "NEW SOUTH" BRICK MACHINERY,
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The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

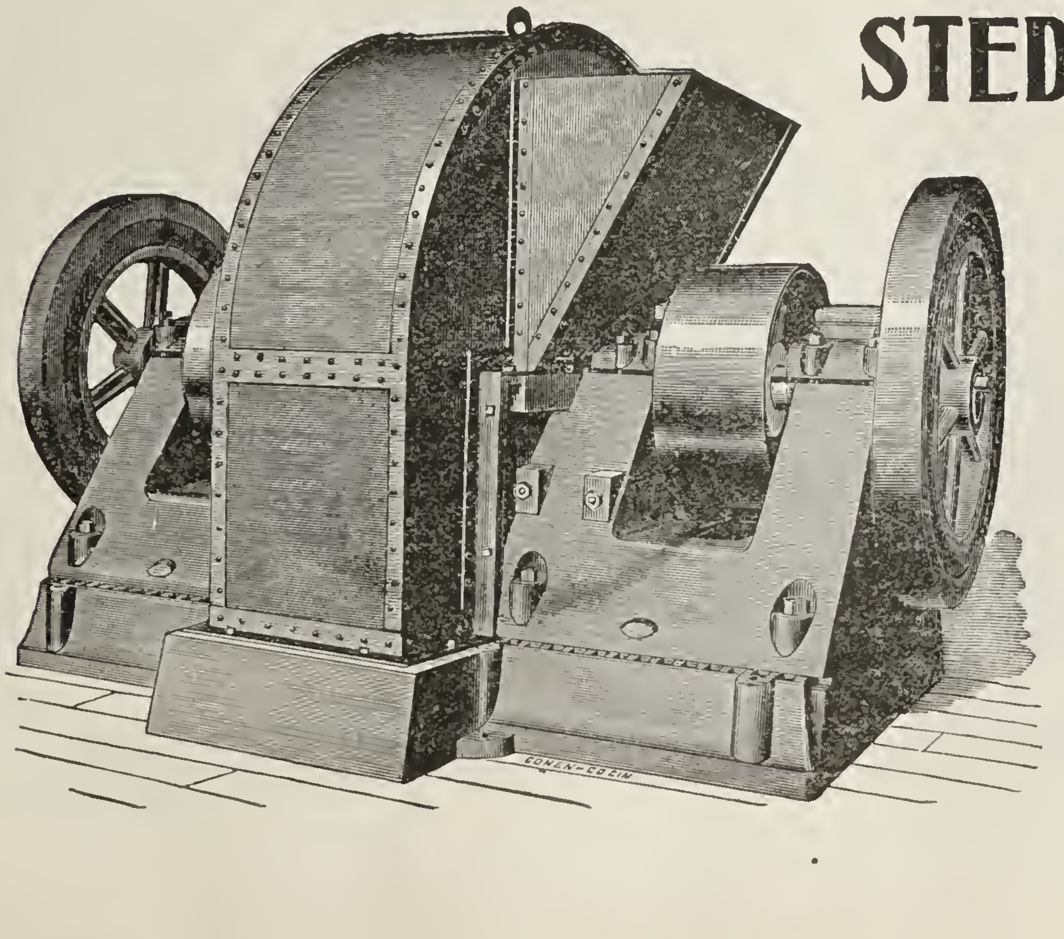
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly Pulverizing Clay in a Dry, Semi-Dry or Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,
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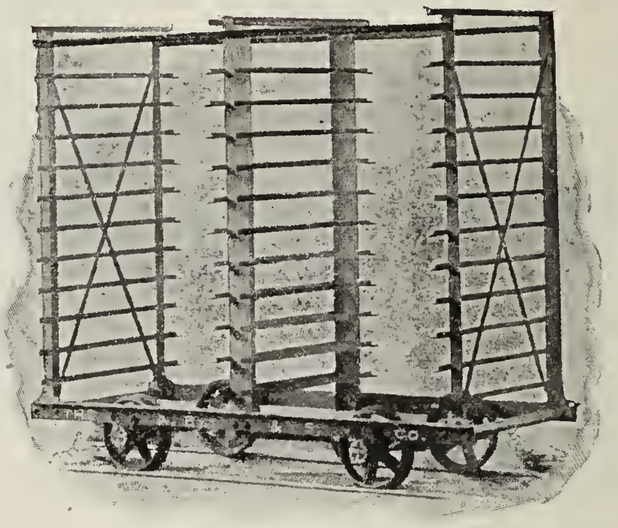
The Atlas Bolt & Screw Co.,

Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

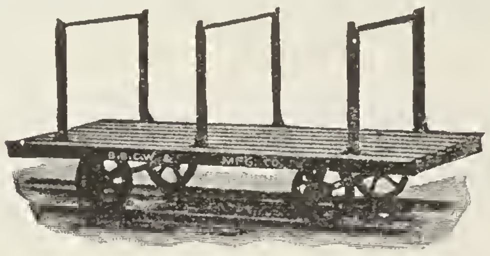
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

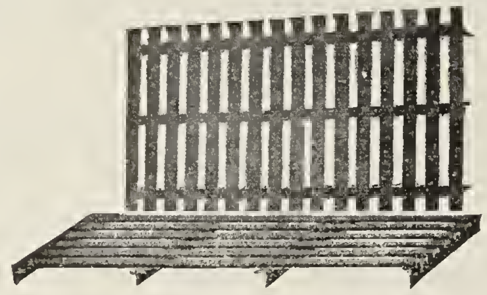
Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

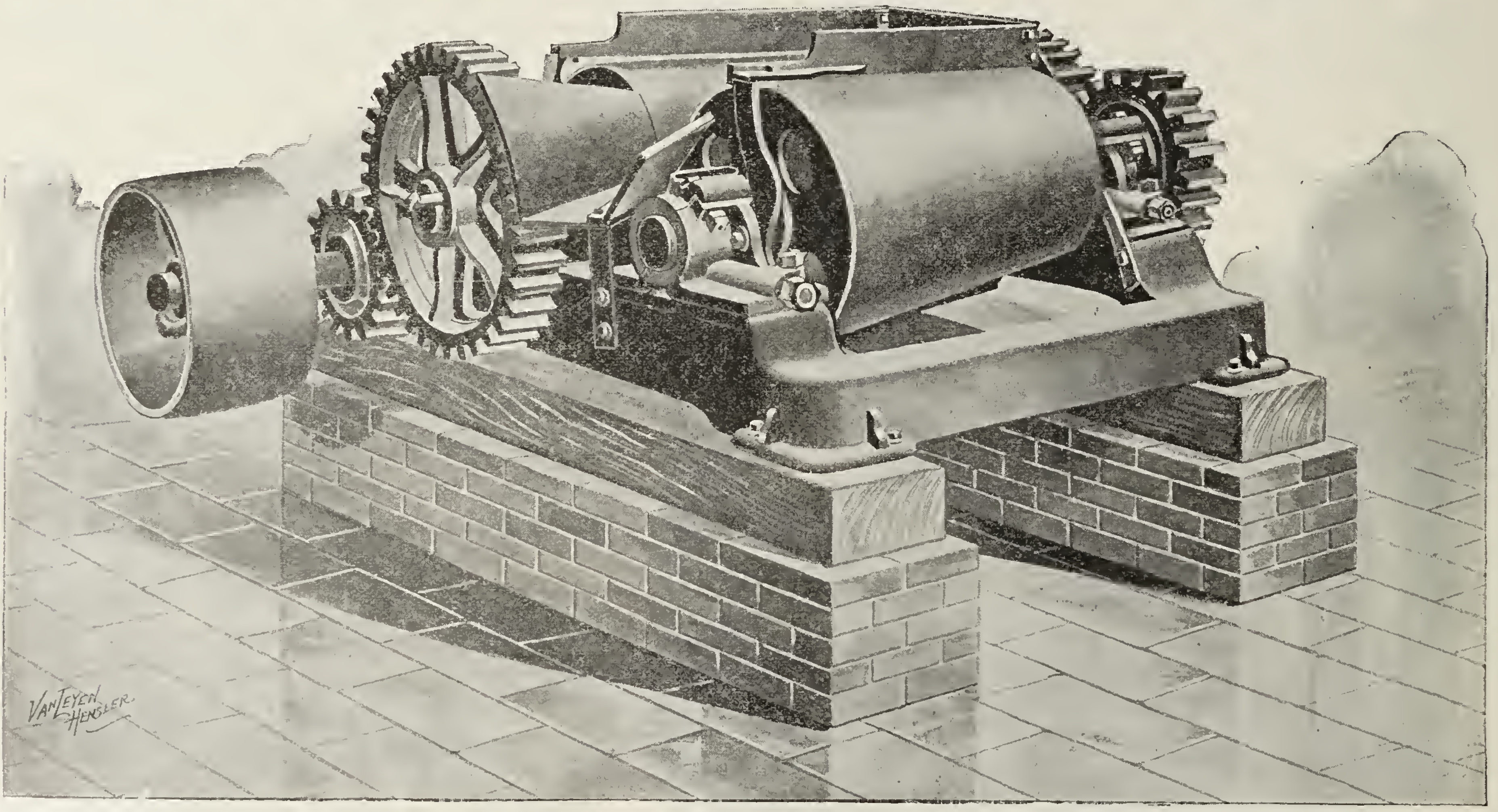
These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.

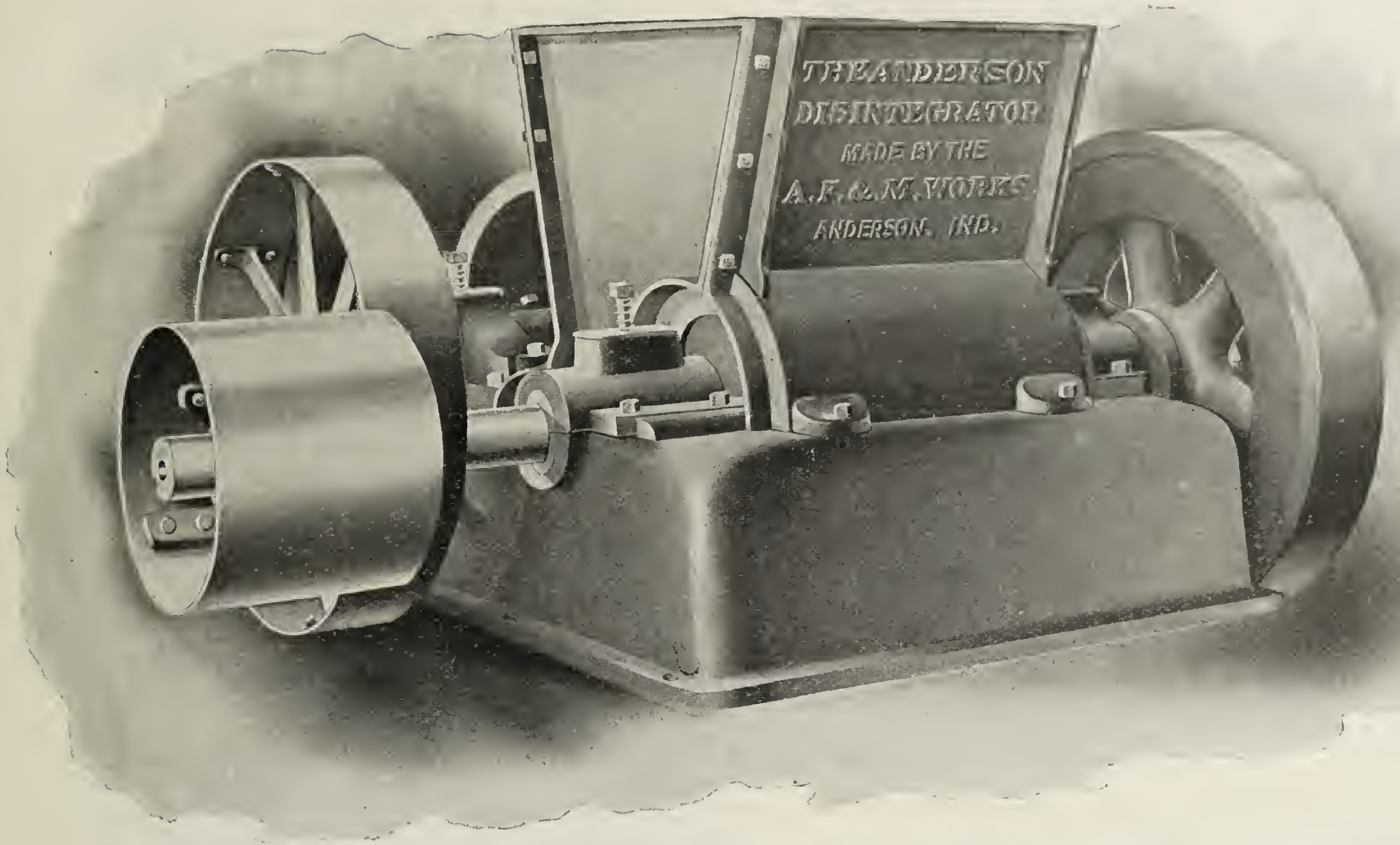
Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

A CRUSHER THAT CRUSHES.



H. BREWER & CO., TECUMSEH, MICHIGAN.



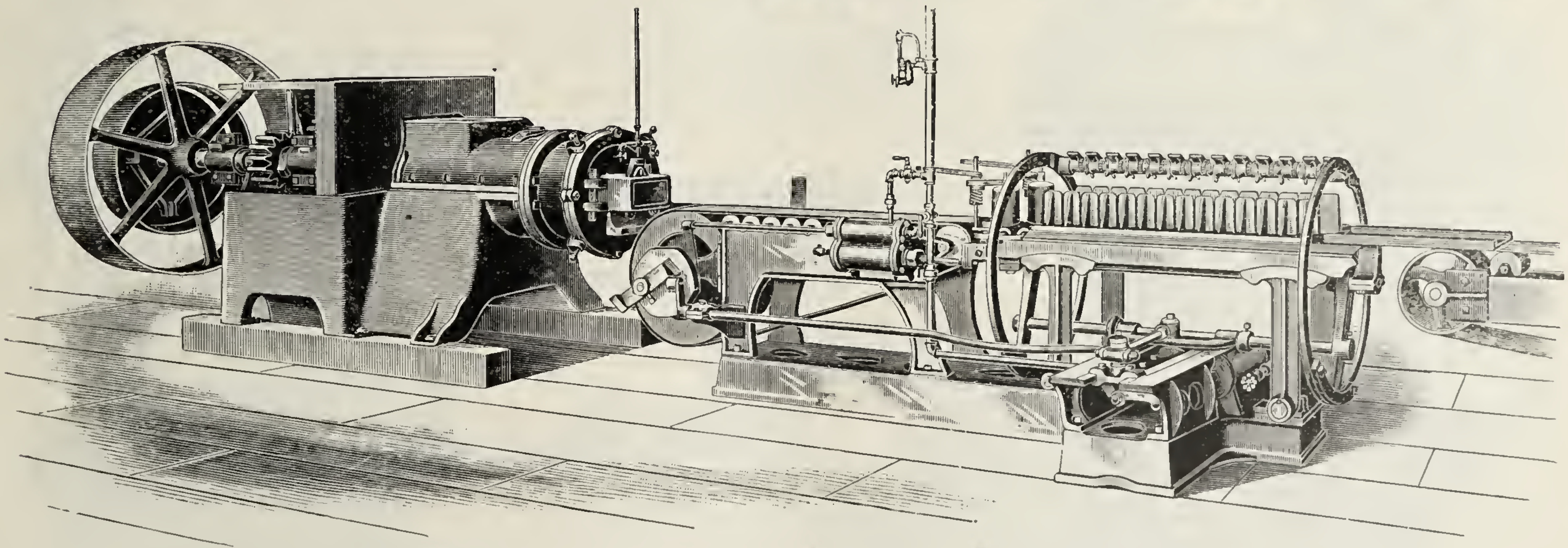
THE ANDERSON SECTIONAL ROLL DISINTEGRATOR.

The ANDERSON FOUNDRY AND MACHINE WORKS,
Manufacturers of NEW DEPARTURE Tile Mills, Pug Mills, all Brickyard Supplies. ANDERSON, INDIANA.

THERE'S ONE BRICK MAHCINE

That does the most work of the highest quality with the least power and repairs,

That's the Leader.

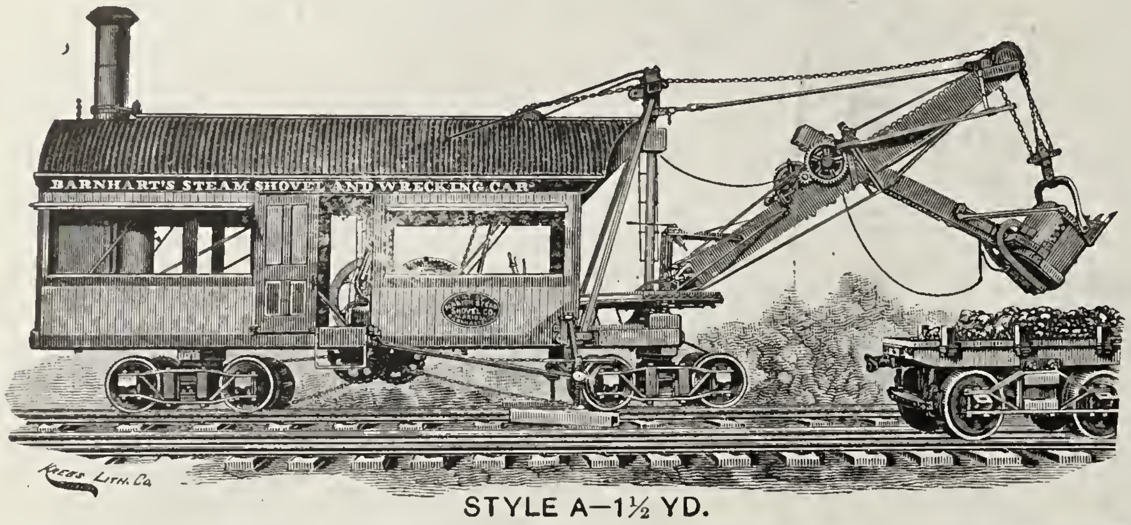


LEADER No. 25, SIDE CUT DIE AND AUTOMATIC CUTTER.

Send your address for printed matter.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.


BARNHART'S STEAM SHOVEL AND WRECKING CAR

STYLE A—1½ YD.

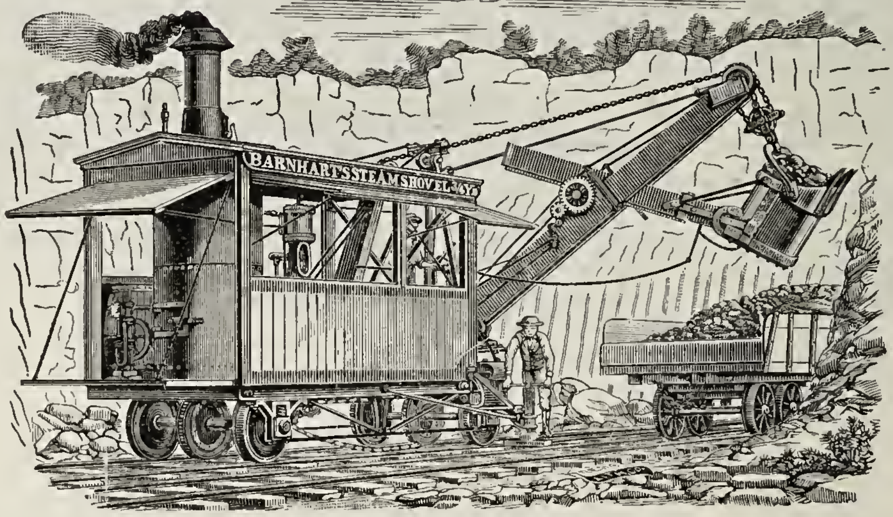
OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

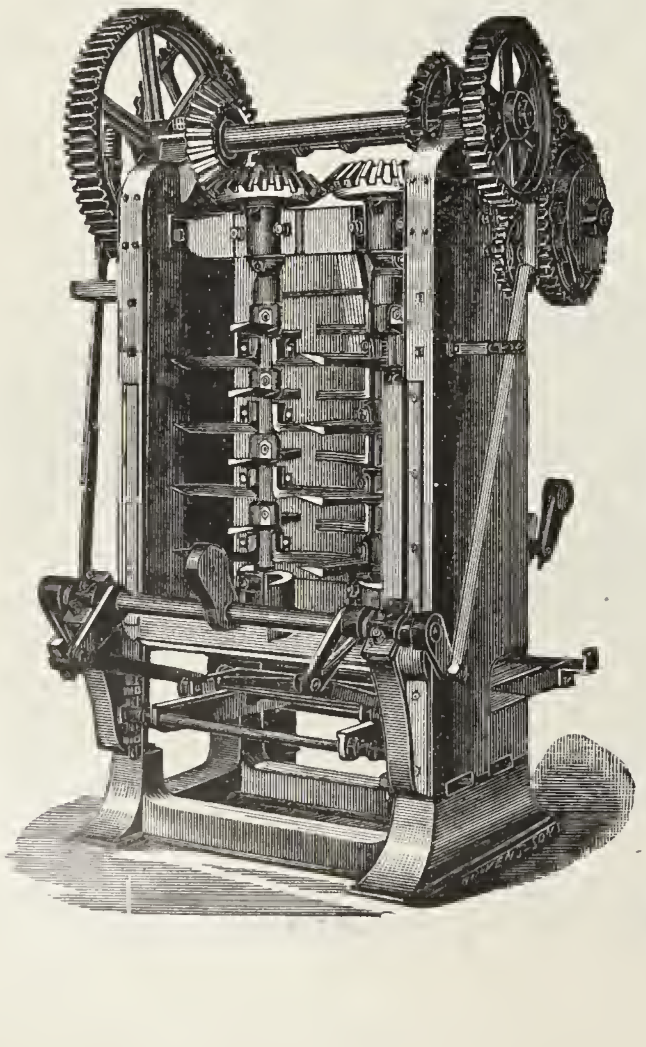
603 West Center Street, - **MARION, OHIO.**



STYLE C—¾ YD.

THE DUPLEX,

Is the Standard of all Soft Clay Brick Machines.



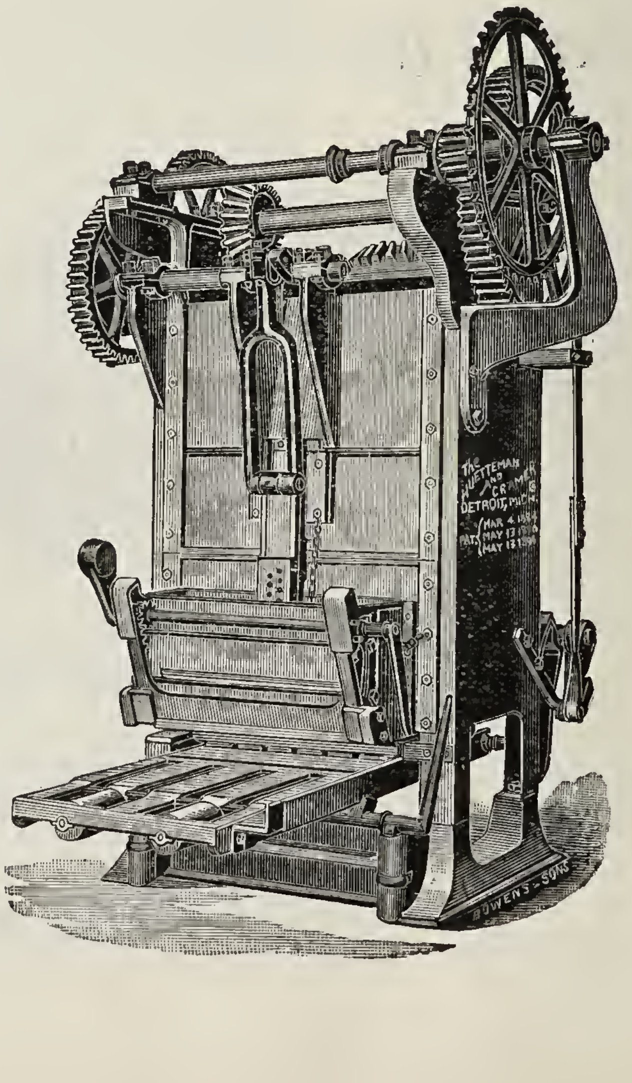
It is made entirely of iron and steel thus being very Strong and Durable, Simple in Construction, and makes a much stiffer brick than can be made with any other soft clay machine.

WRITE FOR CATALOGUE
AND PRICES TO

The Huetteman & Cramer Co.,

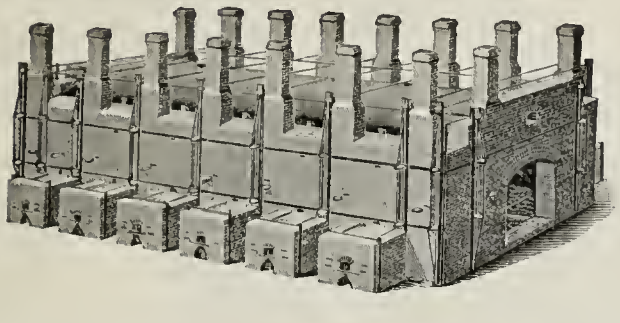
Manufacturers of the Duplex Brick Machine and general outfit for brickyards,

12, 14 & 16 Sherman St.,
DETROIT, - - MICH.



The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.



These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

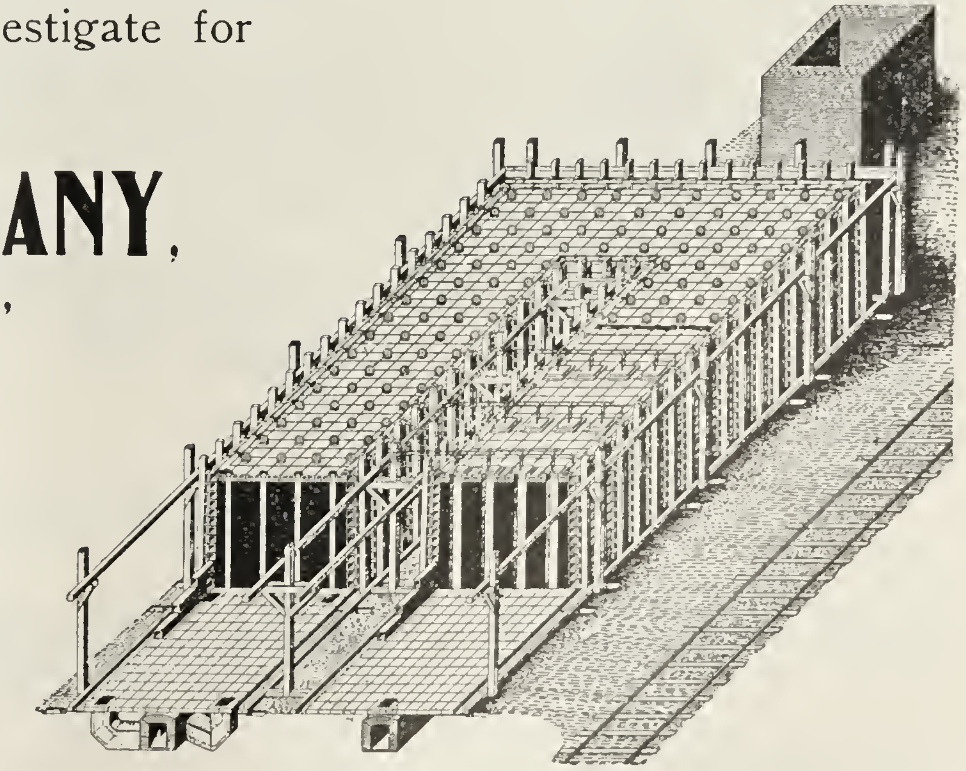
The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

The Lehmann Portable Continuous Kiln,

And the Lehmann Slumming Apparatus

Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.



F. LEHMANN & COMPANY,

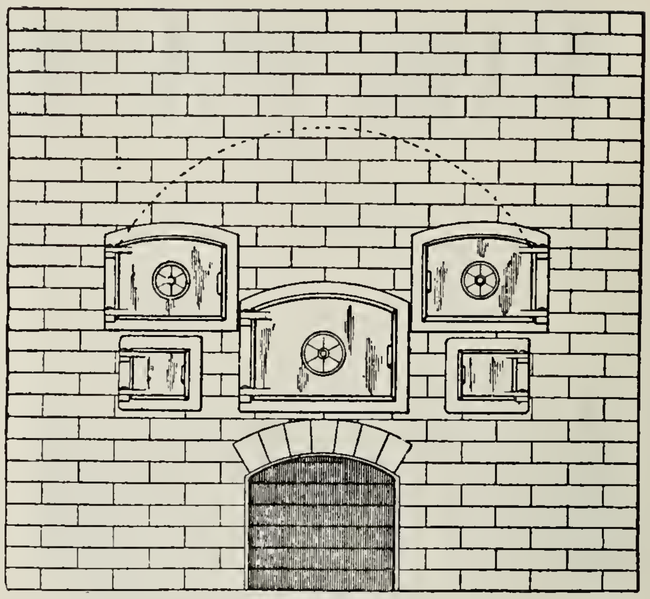
Foot of West Wellington Street,
CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers, Plans and estimates furnished for Brick, Lime and Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.

The GRATH FURNACE.

Gas Producing, Consuming and Coking



PATENTED.

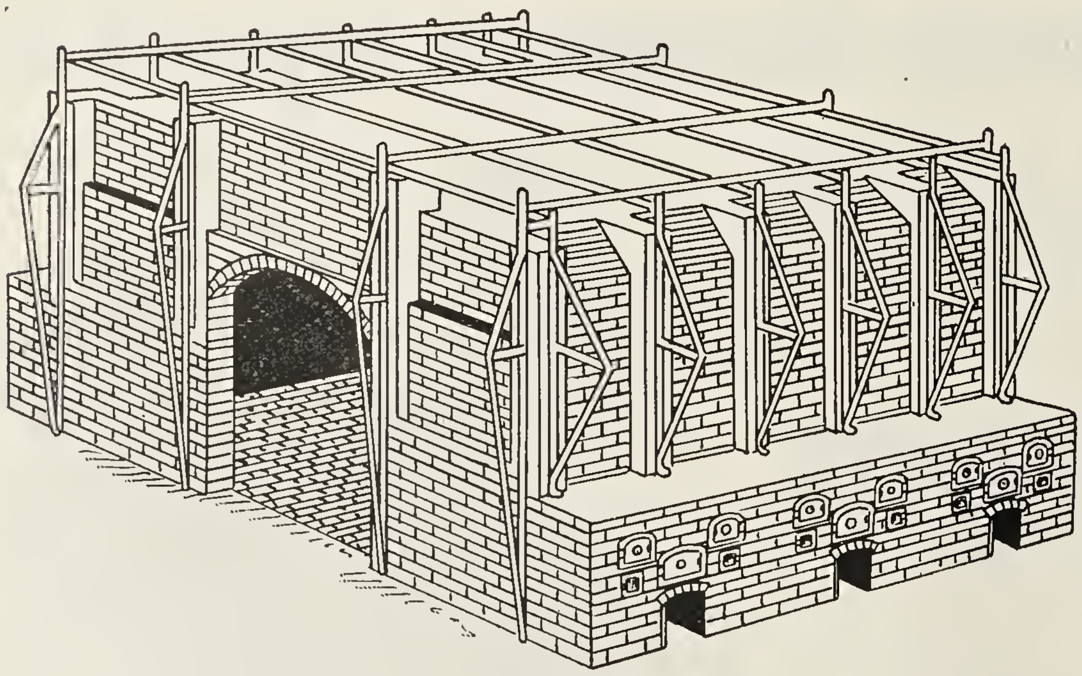
The most important invention of the age for producing a Steady and Uniform heat of any degree of intensity out of the cheapest quality of slack coal. Applicable to kilns for burning brick or for annealing Iron or Steel as well as for boilers or where ever heat is required.

This is the **ONLY** Furnace which consumes **ALL** the black smoke and which will produce as much heat from one ton of slack coal as can be obtained from same amount of lump coal in the ordinary Furnace.

This is the **ONLY** Furnace ever invented where a part of the heat from the fire box or furnace is drawn under the gas or coking table, which process heats the tables to a red hot heat, thus making a genuine gas Producer and Consumer, as the gases as soon as liberated from the coal, are ignited and consumed by being drawn over the incandescent heat of the coke in the fire box. After the gases are all distilled and consumed from the coal, a solid mass of red hot coke remains on the Gas Table which is then shoved over on the grate bars or fire box by a very simple operation of the fireman. A fresh supply of slack is then placed on the Gas table which instantly begins to generate and consume the gases.

This is the **ONLY** Gas and Coking Furnace that produces a steady and continuous incandescent heat and gas flame combined. The principle embodied in this furnace is a new one and is fully protected in our Patent which has just been granted, and we hereby give notice that we will prosecute all persons using a gas or coking furnace in which the heat or part of the heat from the furnace or fire box is drawn underneath the Gas or Coking Table unless such parties using same secured the right from us.

◆



PATENTED.

The GRATH

IMPROVED DOWN-DRAFT

BRICK KILN,

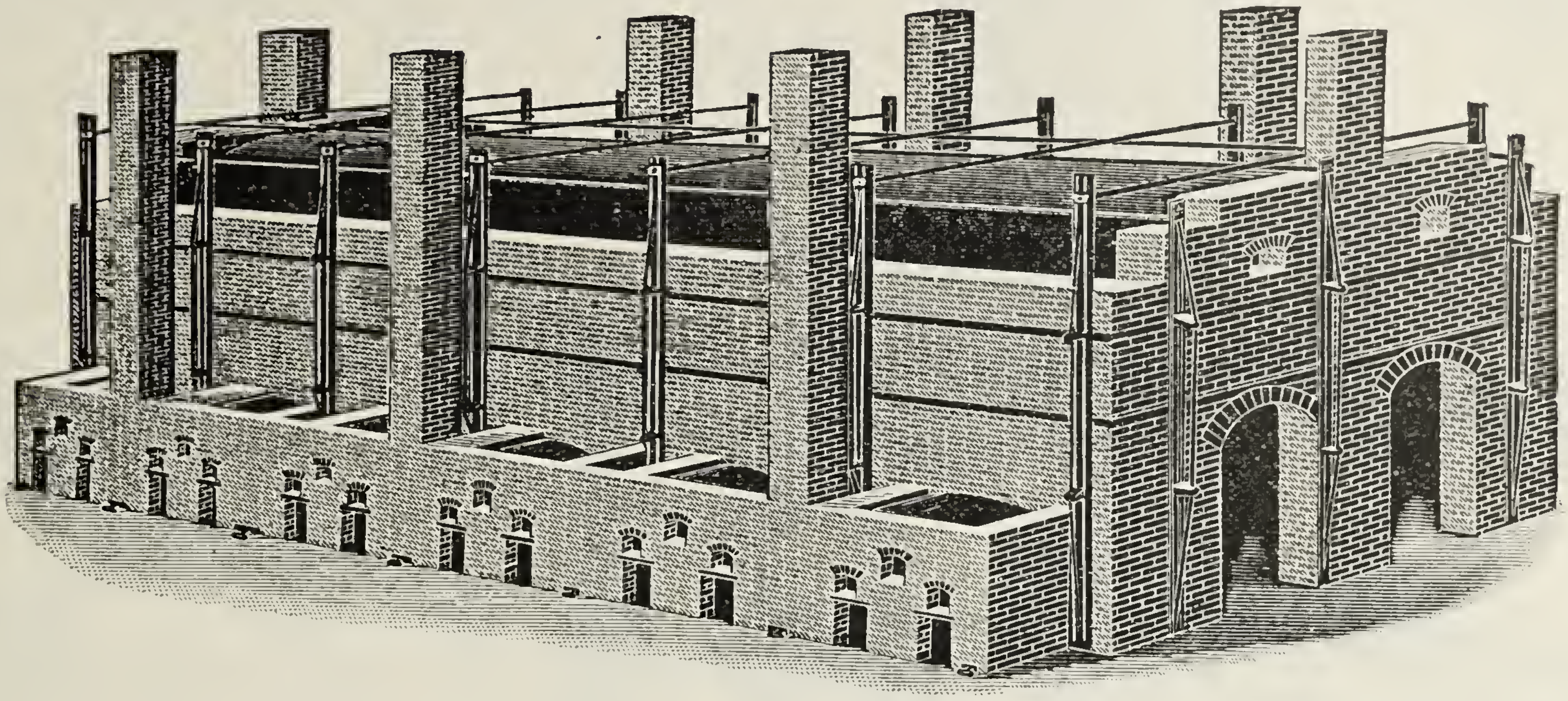
With the Grath Gas and Coking Furnaces attached will produce a larger percentage of Face or Vitrified brick, than any other kiln in the market.

FOR FURTHER PARTICULARS, ADDRESS

The ILLINOIS SUPPLY & CONSTRUCTION CO.,
St. Louis, Mo.

"One of the Greatest Inventions of Modern Times."

F. W. BUTTERWORTH,
Asst. Gen'l Man. Marion Brick Works.



The Swift SLACK COAL COKING-TABLE Furnace Kiln.

THE KILN which has a solid bottom, which is much cheaper to begin with, and is always in repair.

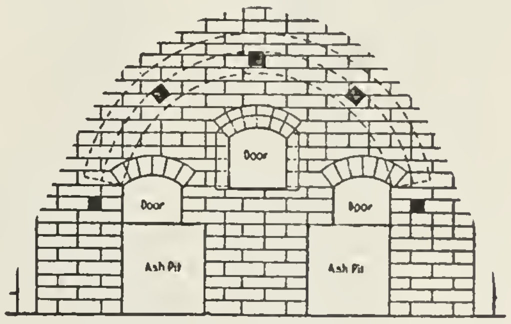
THE KILN that will save one ton of coal out of every seven tons you are using.

THE KILN which is so constructed that the heat is drawn from the bottom with Fan to dryer without danger of checking the cooling ware.

THE KILN that we will guarantee to burn any kind of clay ware with nothing but Slack Coal from start to finish of burn.

THE KILN that will burn Paving Brick in from 30 to 60 hours less time and not injure the ware, as the cold air is excluded from start to finish.

THE KILN that has the famous **Swift Coking-Table Furnace** attached to it; the furnace which is to-day being attached to all kinds of kilns—Up-draft, Clamp, Down-Draft, Round and Square, and also one continuous Kiln, has been re-modeled, and is giving entire satisfaction.



THE SWIFT COKING TABLE FURNACE.

BEWARE OF IMITATIONS,

And do not purchase or use furnaces with coking table between two fires. Such tables are infringements on my patents and their use will subject users to royalty and the cost of collecting same. I am the originator of the idea of a coking bench between two fires, my invention is covered by letters patent and I propose to protect same fully.

F. E. SWIFT,

Send for Catalogue.

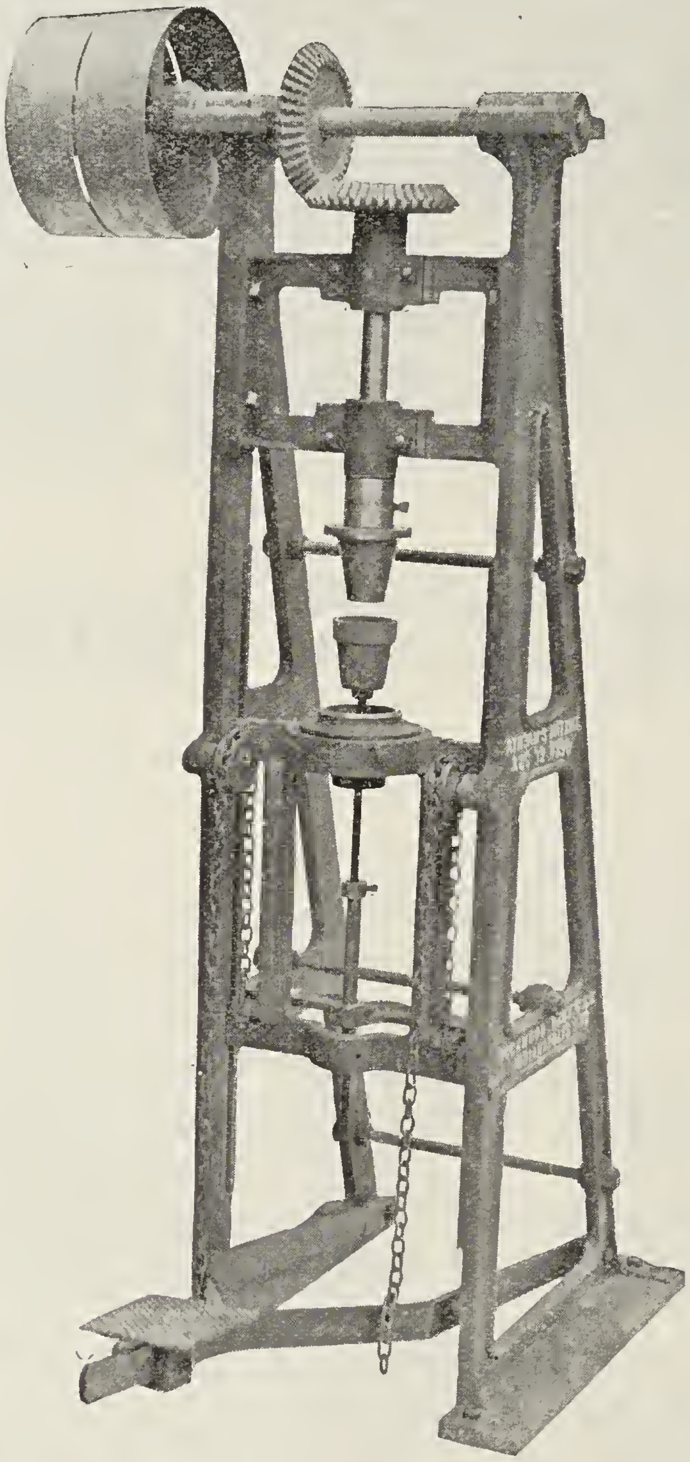
Washington, Iowa, U. S. A.

THE ONLY SUCCESSFUL FLOWER POT MACHINE.

(PATENTED.)

Capacity in Ten Hours:

6,000, 2 inch Pots.
4,500, 3 " "
3,500, 4 " "
2,500, 5 " "
2,000, 6 " "
1,500, 7 " "



Makes Better and Cheaper Pots than can be Made by Hand. Does not Require Expert Workmen.

Write for Circulars and Prices.

The Rockwood Mfg. Co.,

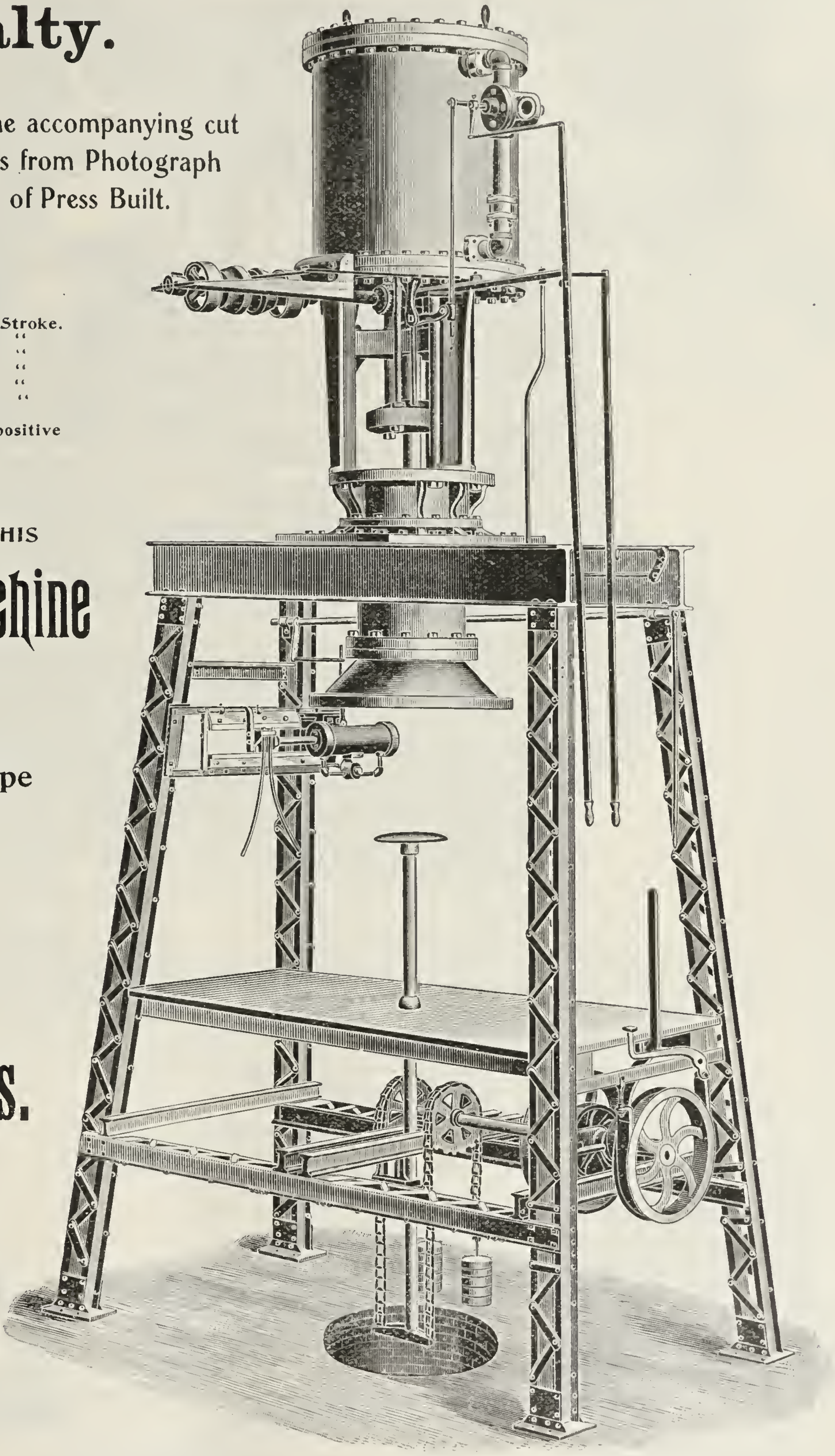
No. 332 South Pennsylvania St. *INDIANAPOLIS, IND., U. S. A.*

SEWER PIPE AND TILE MACHINERY,

Our Specialty.

The First Machine of this Type was manufactured for Montague & Co., Chattanooga, Tenn., November 1897. . .

The accompanying cut is from Photograph of Press Built.



DURING THE PRESENT YEAR
WE HAVE BUILT THESE SIZES:

44	in. Steam Cylinder,	20	in. Clay Cylinder,	42	in. Stroke.
44	" "	20	" "	50	"
48	" "	22	" "	48	"
48	" "	24	" "	48	"
52	" "	24	" "	48	"
52	" "	26	" "	60	"

All the above are in successful operation and are positive witnesses of their Excellence.

—•—

WRITE US FOR DESCRIPTION OF THIS

Strictly Up-to-Date Machine

—•—

To make the Most Pipe
—AND—
To make the Best Pipe

BUY THIS MACHINE
OUR DIES. . . . .

—•—

LET US TELL YOU OF OUR

Steele Frame,
Ball=Bearing

DRY AND WET PANS.

DON'T EXPERIMENT
WITH UNTRIED MACHINES.

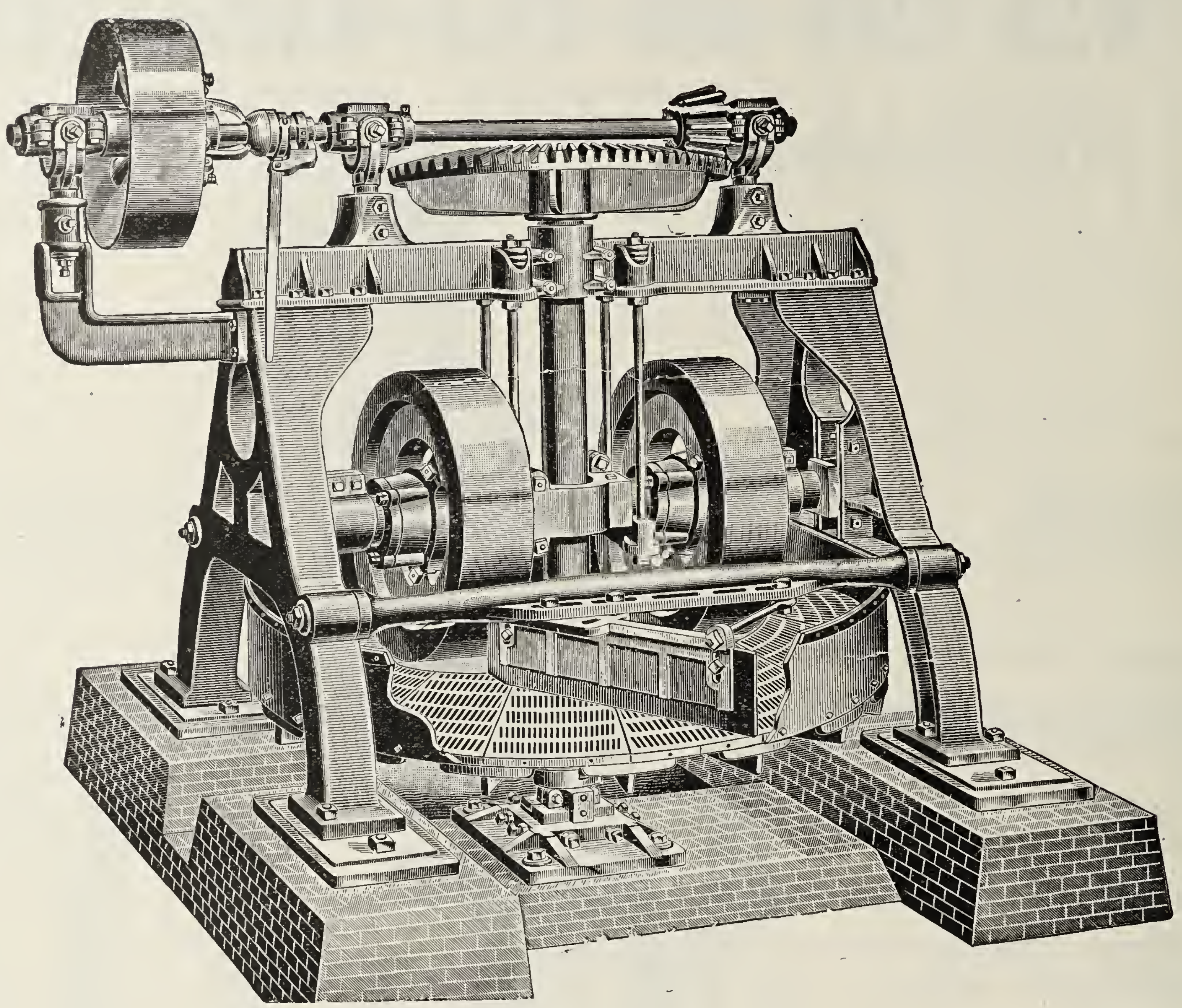
"Be Sure You're Right, then Go Ahead."

—•—

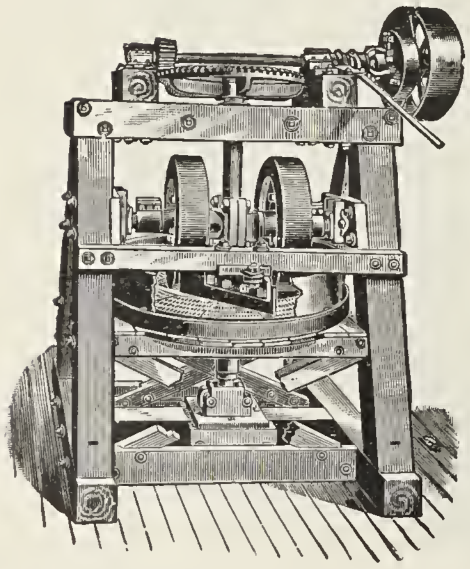
Our Pottery Machinery
Is Unequalled.

MANUFACTURED BY

TAPLIN, RICE & CO., AKRON, ...OHIO.

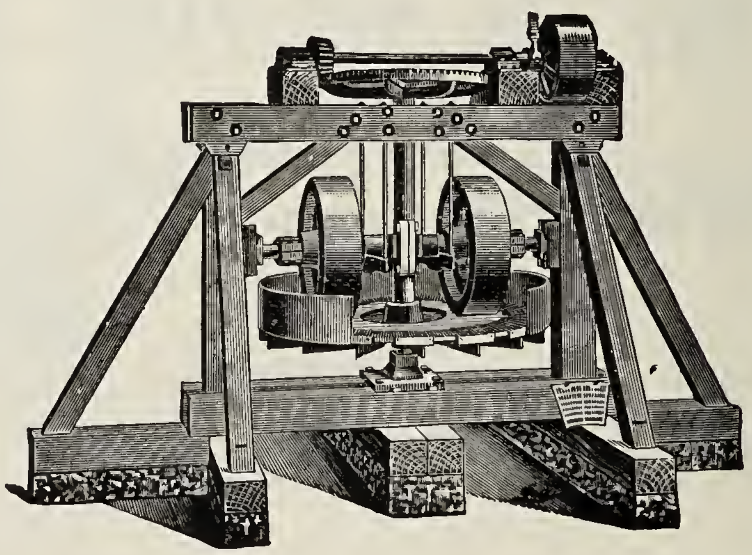


OUR SPECIALTY IS **DRY PANS.**



IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



......SEND FOR NEW ILLUSTRATED CATALOGUE......

FROST ENGINE CO., Galesburg, Ill., U. S. A.

We Lead! Others Follow!

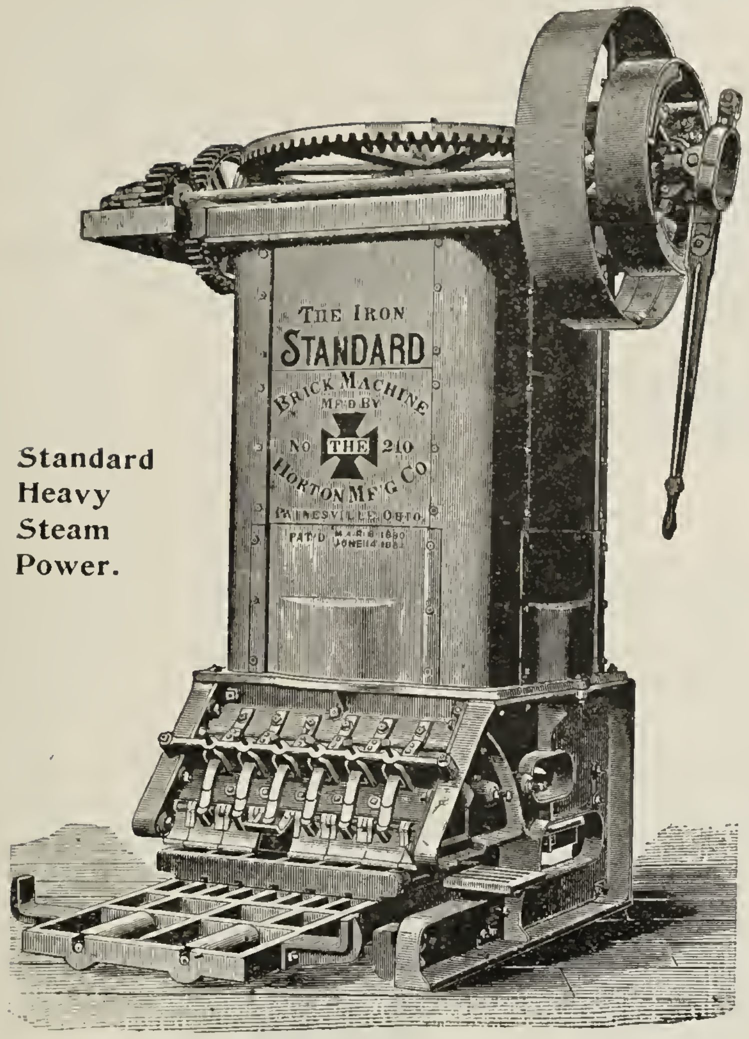
• • •

The Hercules!

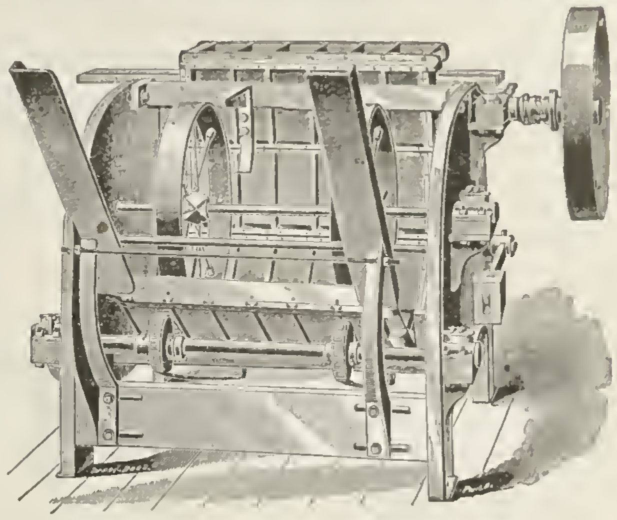
Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

The Standard Machine is just what its name implies.

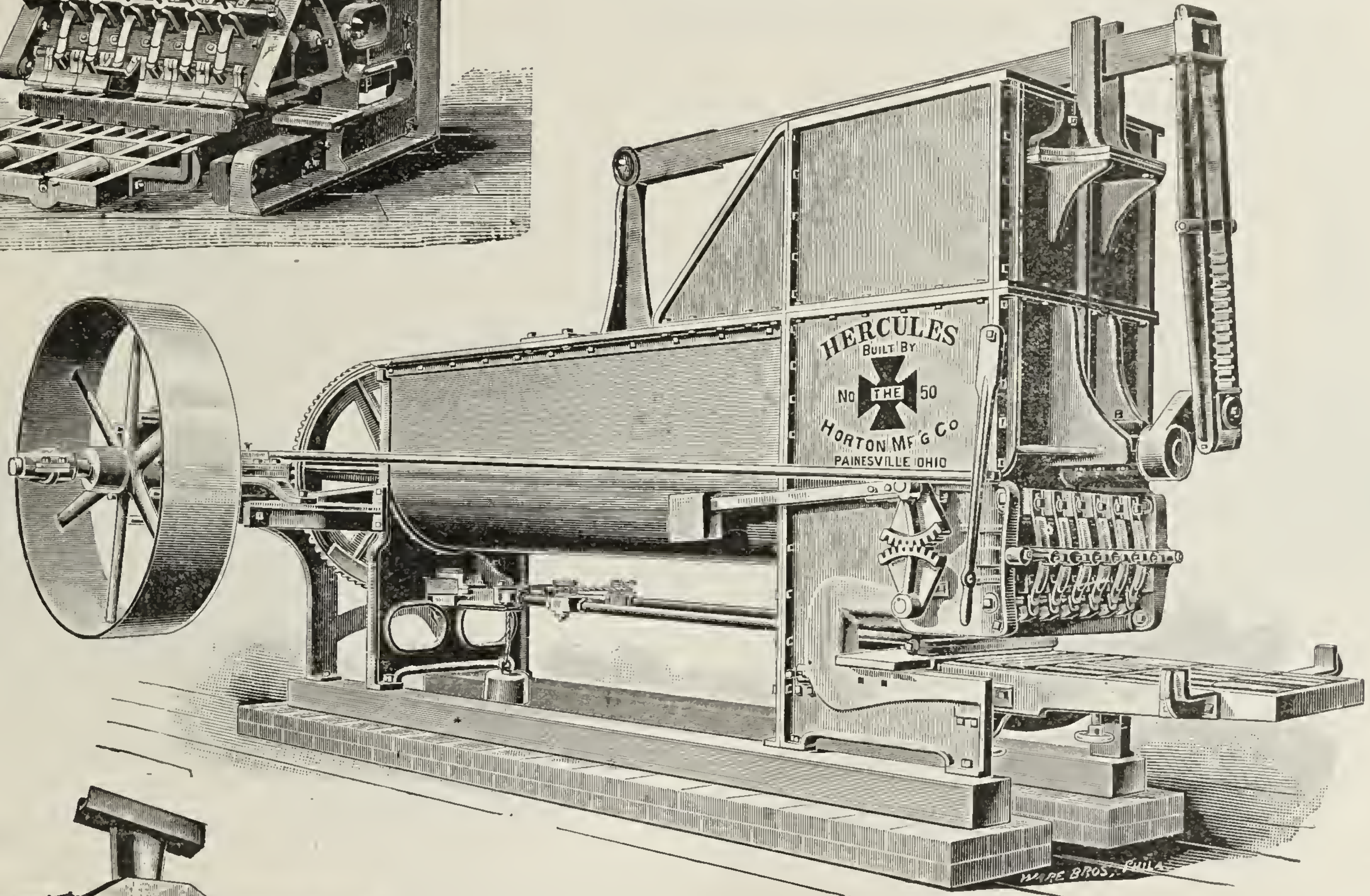
SEND FOR
1899 CATALOGUE.



Standard
Heavy
Steam
Power.

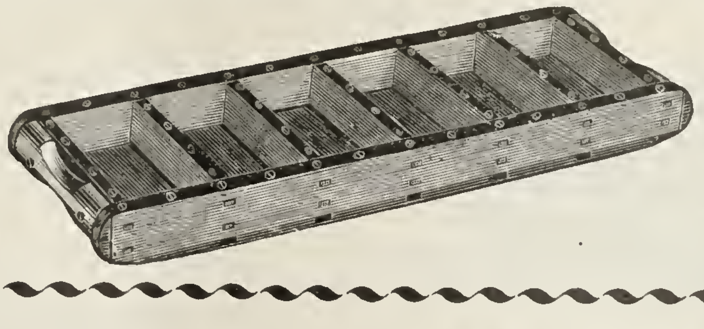


HORTON MOLD SANDER DIRECT FEED.

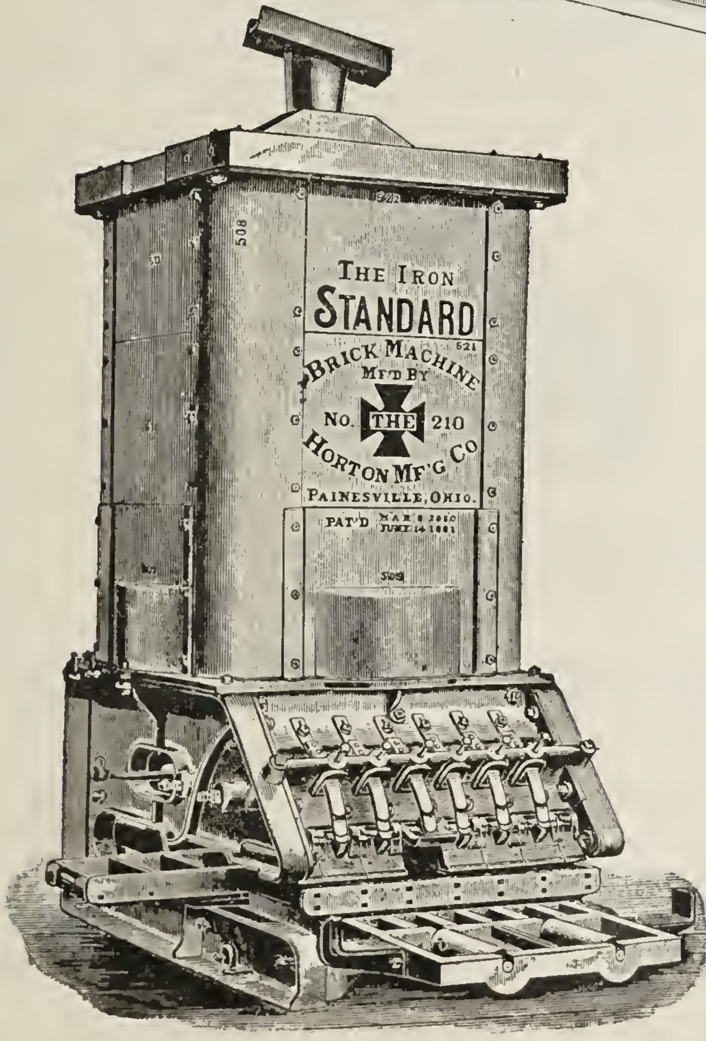


Hercules capacity 40,000
to 50,000.
Weight 15,000 pounds.

We are making a special drive on Molds this season. Send for our new circular on molds.



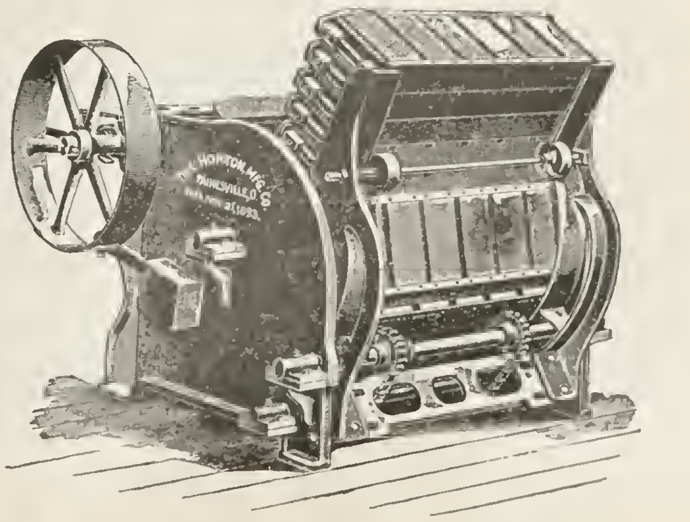
WE HAVE recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.



IRON STANDARD HORSE POWER.

The HORTON MANUFACTURING COMPANY.

PAINESVILLE,
OHIO.



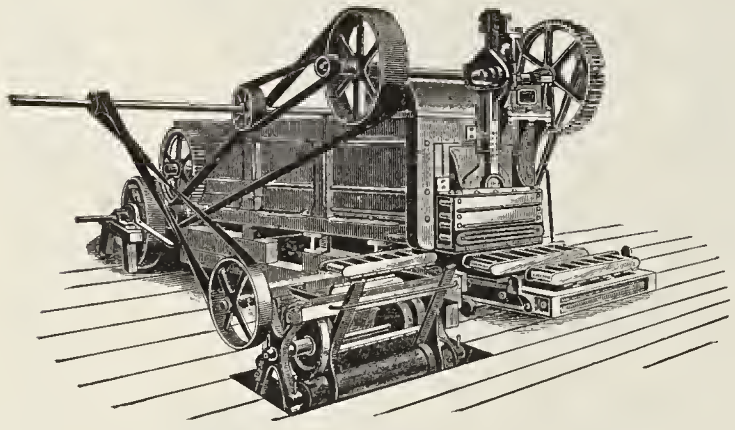
THE AUTOMATIC FEED MOLD SANDER.

DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the best, namely,

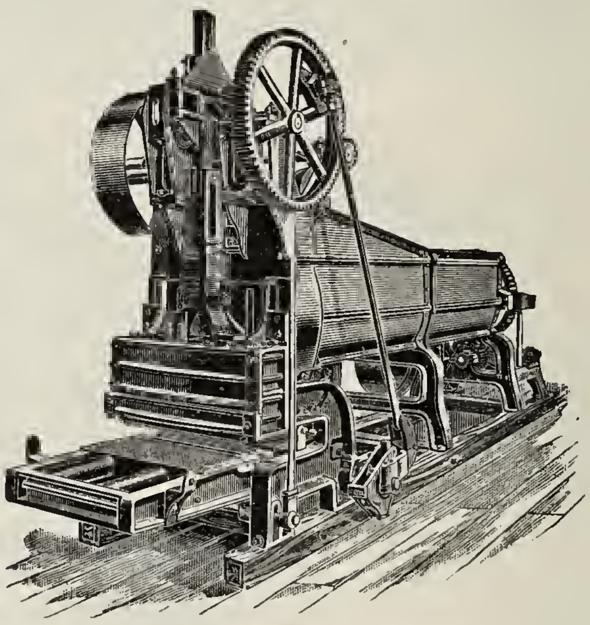
··THE··
POTTS Horizontal Stock Brick Machine

They do all Claimed for Them. You take no chances of an Experiment.



Wood Pug Mill.

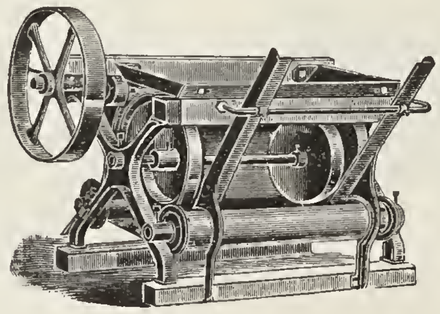
They have no equal for making Brick which have Clean, Sharp Corners and Smooth Surfaces.



Iron Frame Pug Mill.

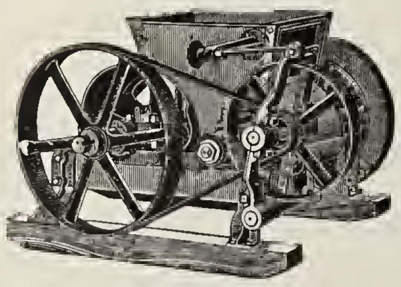
They are the only machines which will work the clay direct from the bank without the use of an extra Pug Mill.

They are **Simple in Construction, Strong and Durable.** Every machine guaranteed to do as claimed for it.



Mould Sanders,

Which have no equal for sanding the moulds, no light complicated parts to wear or break. They do not waste or spill the sand. Guaranteed to do all claimed for them.



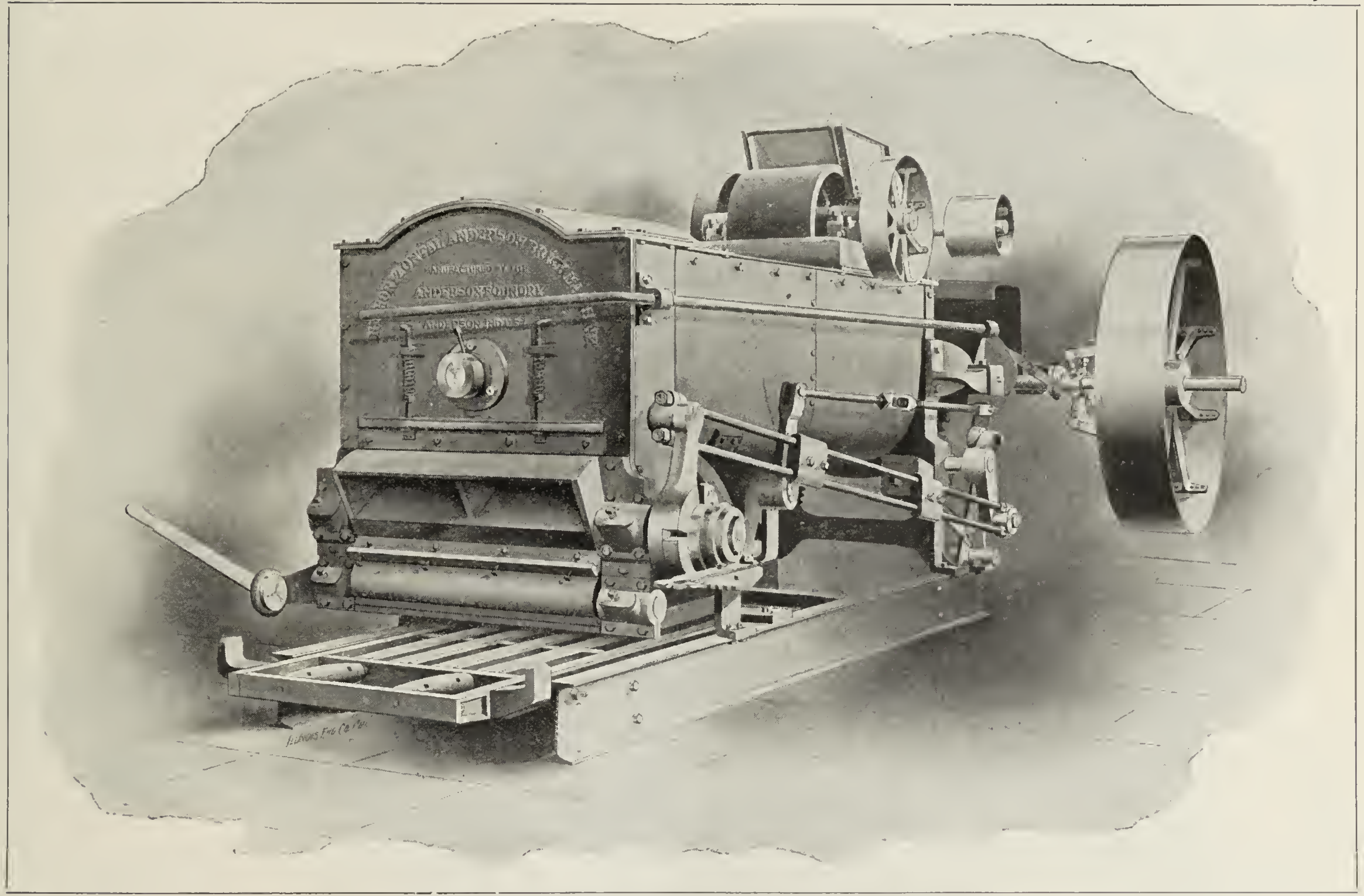
Disintegrators,

Built of good material, strong and durable. They do the work claimed for them, built in a number of sizes to suit any yard.

For terms and prices of anything needed on the brickyard write

C. & A. POTTS & CO., 814 to 824 W. Wash. St., INDIANAPOLIS, IND.

Combined Horizontal Anderson Brick Machine and Disintegrator.



Manufactured by

The Anderson Foundry
and Machine Works,

ANDERSON, INDIANA.

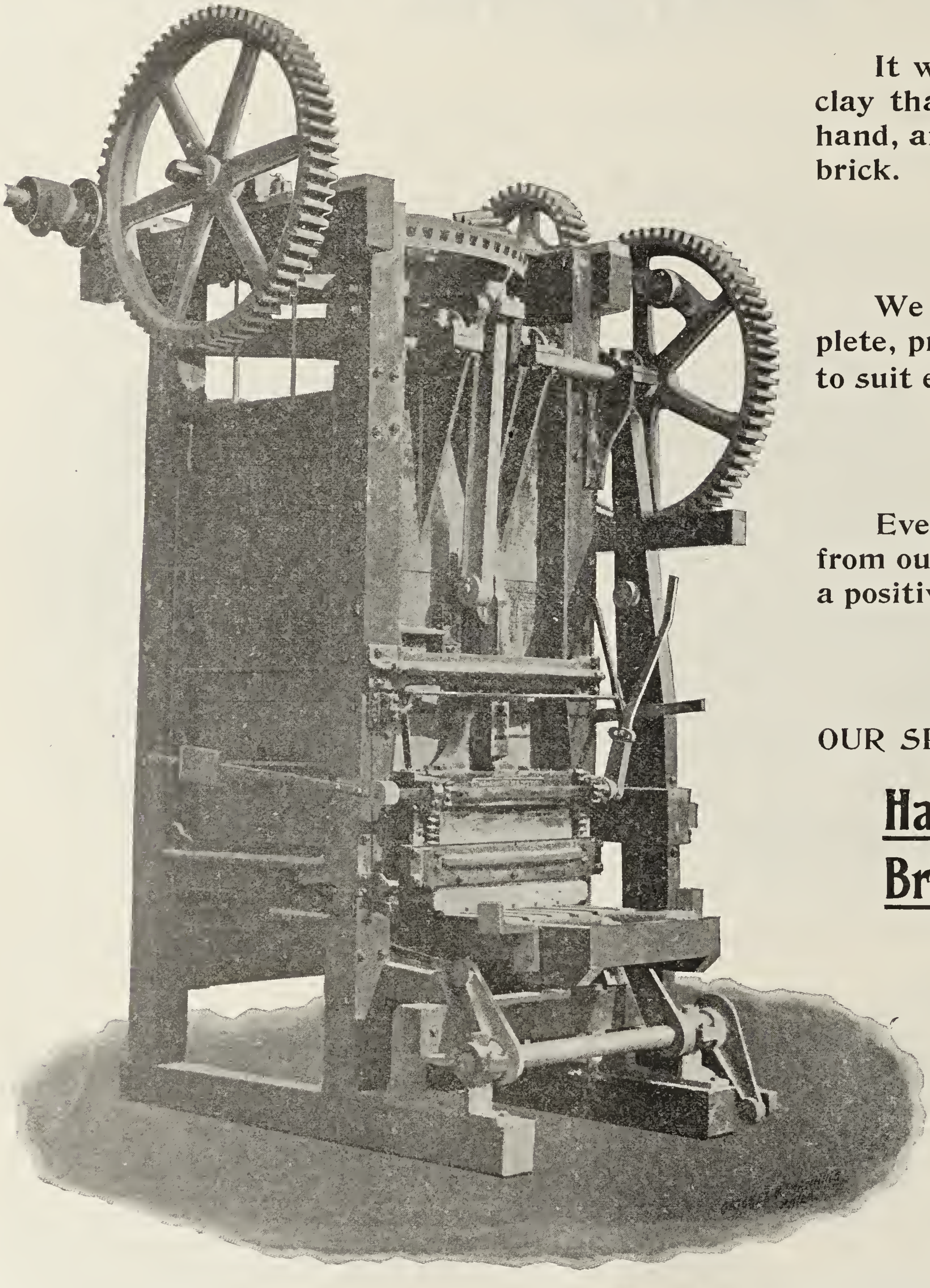
1857-1899.

THE

"Martin" Brick Machinery

STANDS UNEQUALLED FOR

Simplicity, Strength and Durability.



It will work any kind of clay that can be worked by hand, and turn out a perfect brick.

* * * *

We equip plants complete, preparing special plans to suit each need.

* * * *

Every machine shipped from our factory is sold under a positive guarantee.

* * * *

OUR SPECIALTY——

Hand and Machine Brick Moulds.

* * * *

All Inquiries
have prompt
and careful
attention.

* * * *

Send for General Catalogue. Mentioning anything you need.

THE HENRY MARTIN BRICK MACHINE MFG. CO.,

INCORPORATED.

LANCASTER, PA., U. S. A.

The Eagle Repress.

THE MACHINERY THAT NEVER DISAPPOINTS

It stands upon it's Record. If you are Interested, Particulars are yours upon request. Drop us a Line.

••••

MANY USERS SAY:

"THE EAGLE does More Than we Promise."

NO ONE HAS SAID:

"THE EAGLE has not done all that was promised."

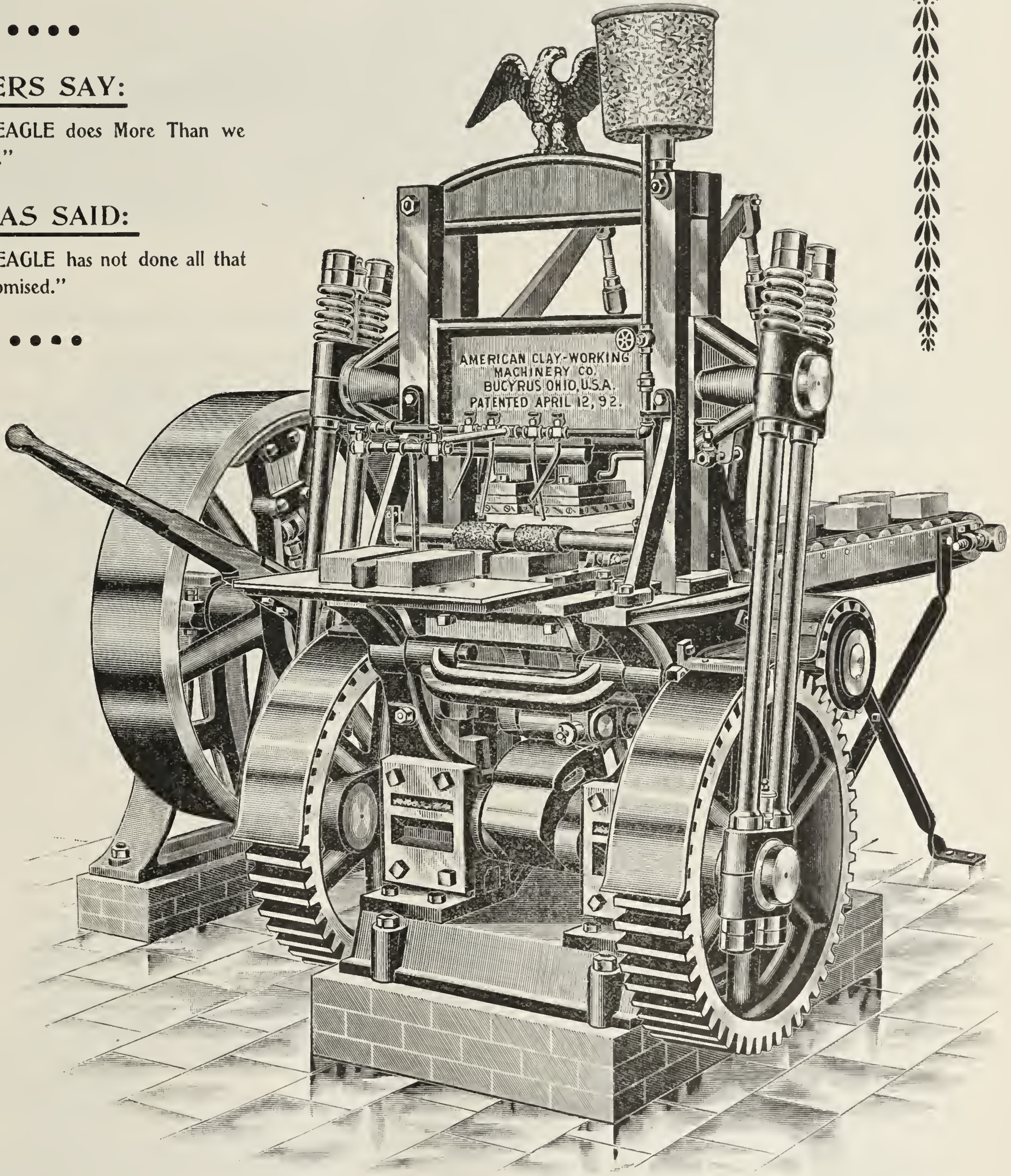
••••

Ten
Sold
in a
Single
Week.

••

How's
That
To
Start
1899
With.

••

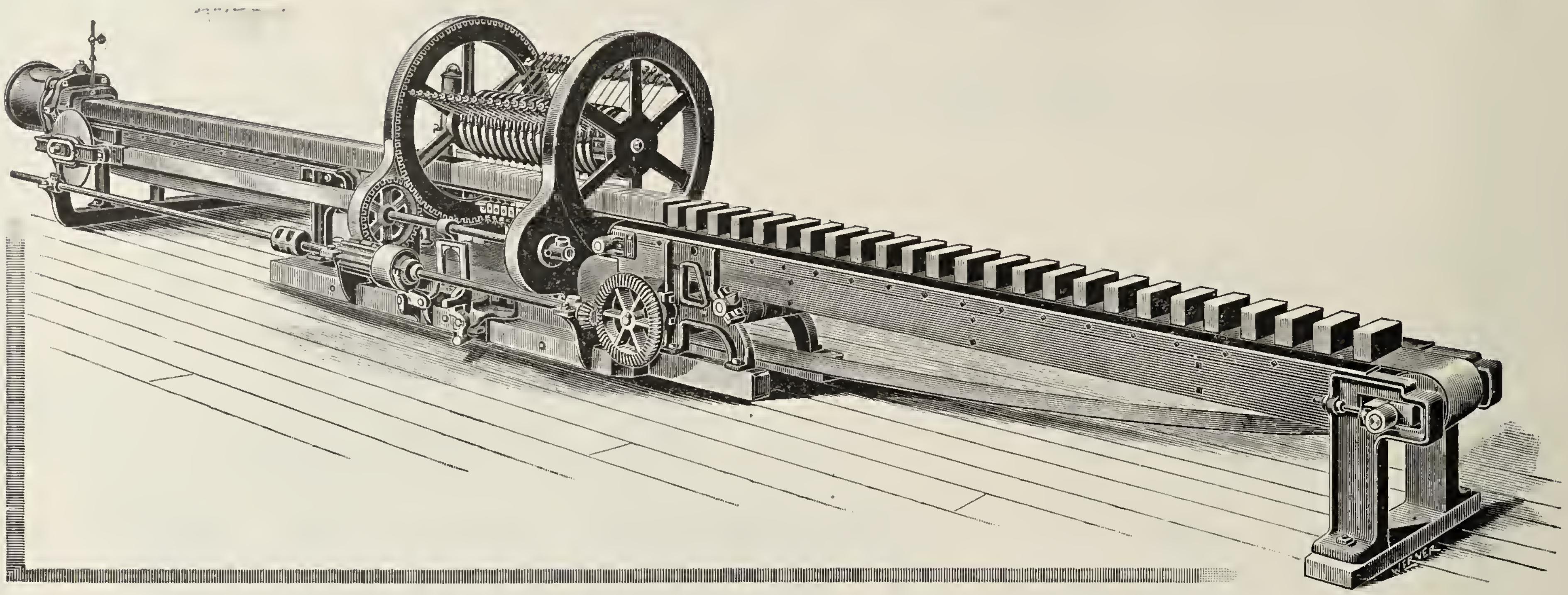

AMERICAN CLAY-WORKING
MACHINERY CO.
BUCYRUS OHIO, U.S.A.
PATENTED APRIL 12, 92.

We build a complete line of machinery and appliances for every branch of the clay trade.
Money saved on every purchase.
Write for complete catalogue.

The American Clay-Working Machinery Co.,
BUCYRUS, OHIO, U. S. A.

FINALLY

**Side Cut Brick
Automatically Cut
With SMOOTH EDGES.**



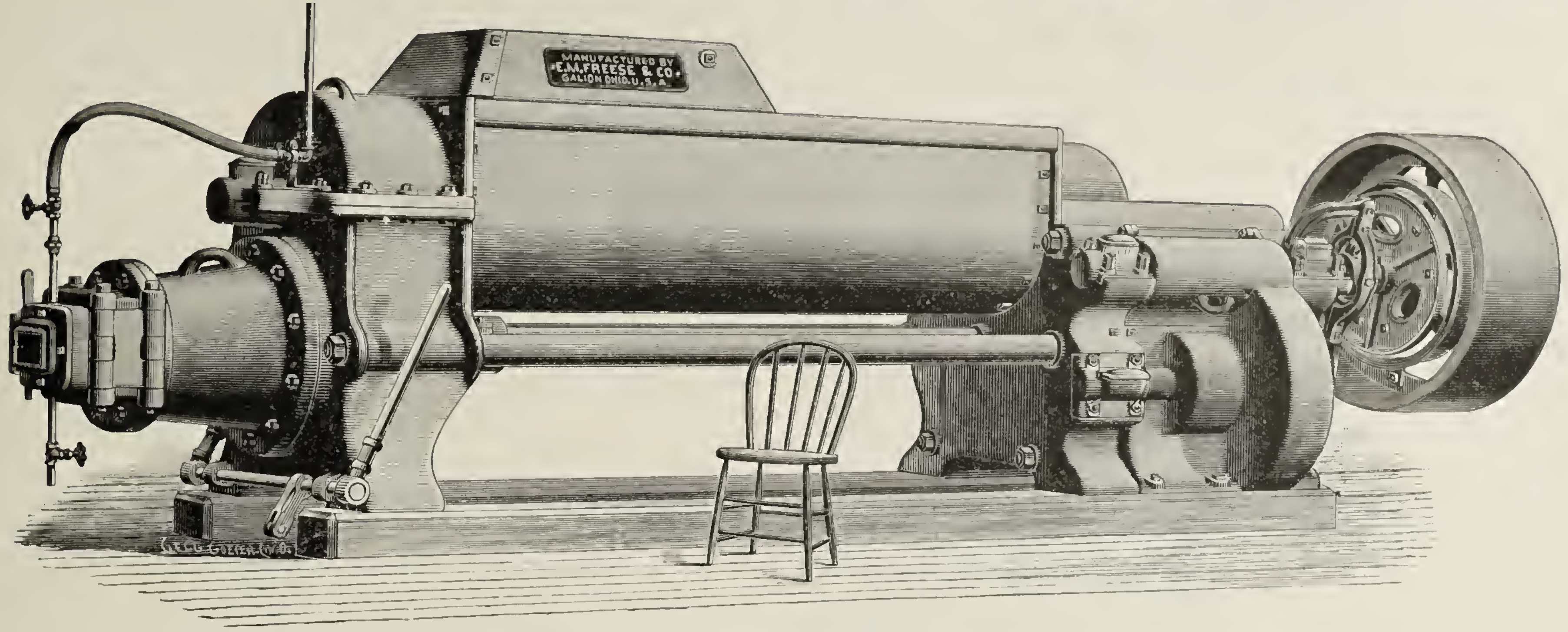
A New Rotating Cutter for Side Cut Brick.

POINTS.

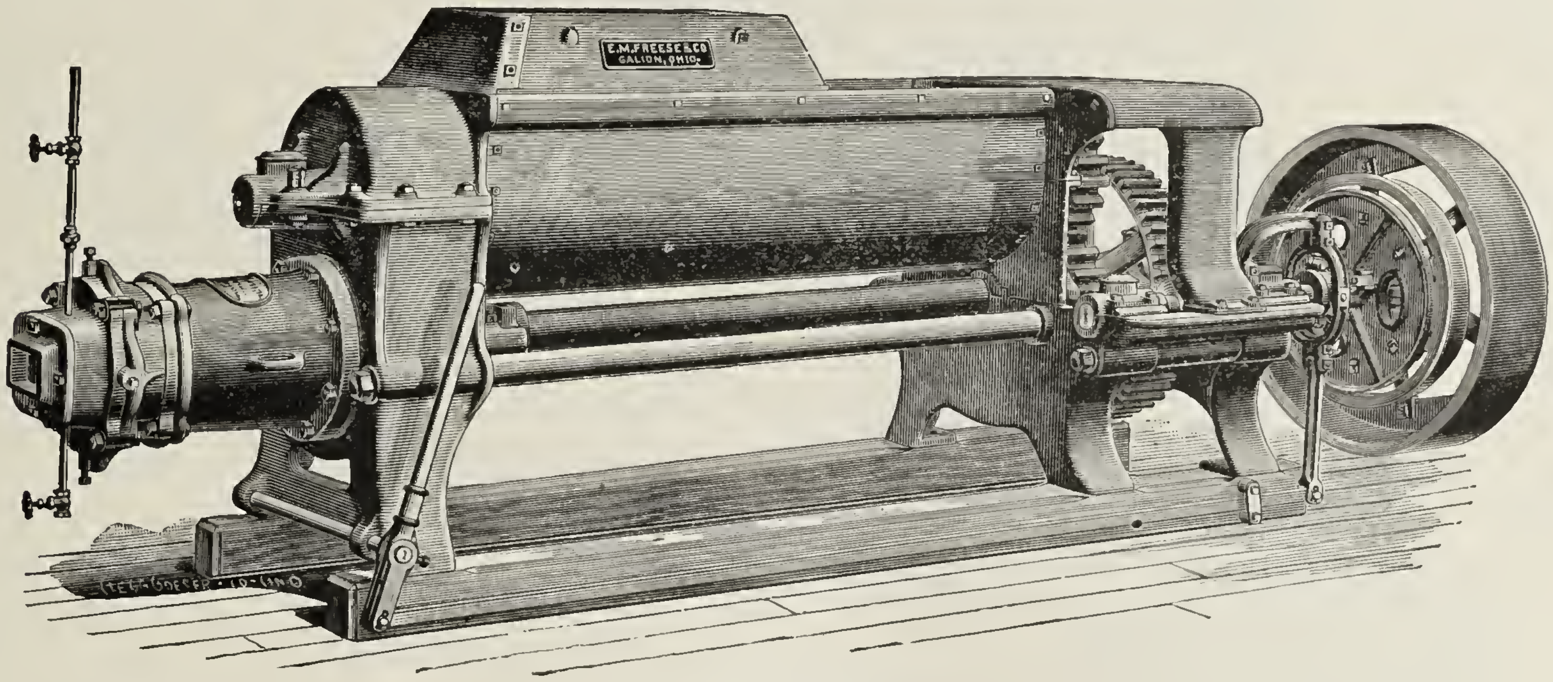
- Of simplest construction. Entirely automatic and positive in operation.
- A combined downward and lateral movement of the wires insures brick with **smooth edges.**
- The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
- Cutting wires are short and make a square and straight cut.
- New wires easily put on without stopping, stooping or poking end of wire through a hole.
- More than twice as much time is afforded for renewing wires as in other cutters.
- Movement of all parts is slow.
- Clay does not propel cutting wires.
- No auxiliary or friction belts used.
- No tensions to regulate.
- No regulation or adjustment required.
- No crank or pitman rod used.
- No reciprocating wire frame used.
- No machinery underneath.
- Absence of all complicated gearing.
- Cannot miss a cut or cut a crooked brick.
- All the brick are of the same thickness.
- Substantial and durable in all parts.
- Capacity ample for any brick machine.

E. M. FREESE & CO.,
Galion, Ohio.

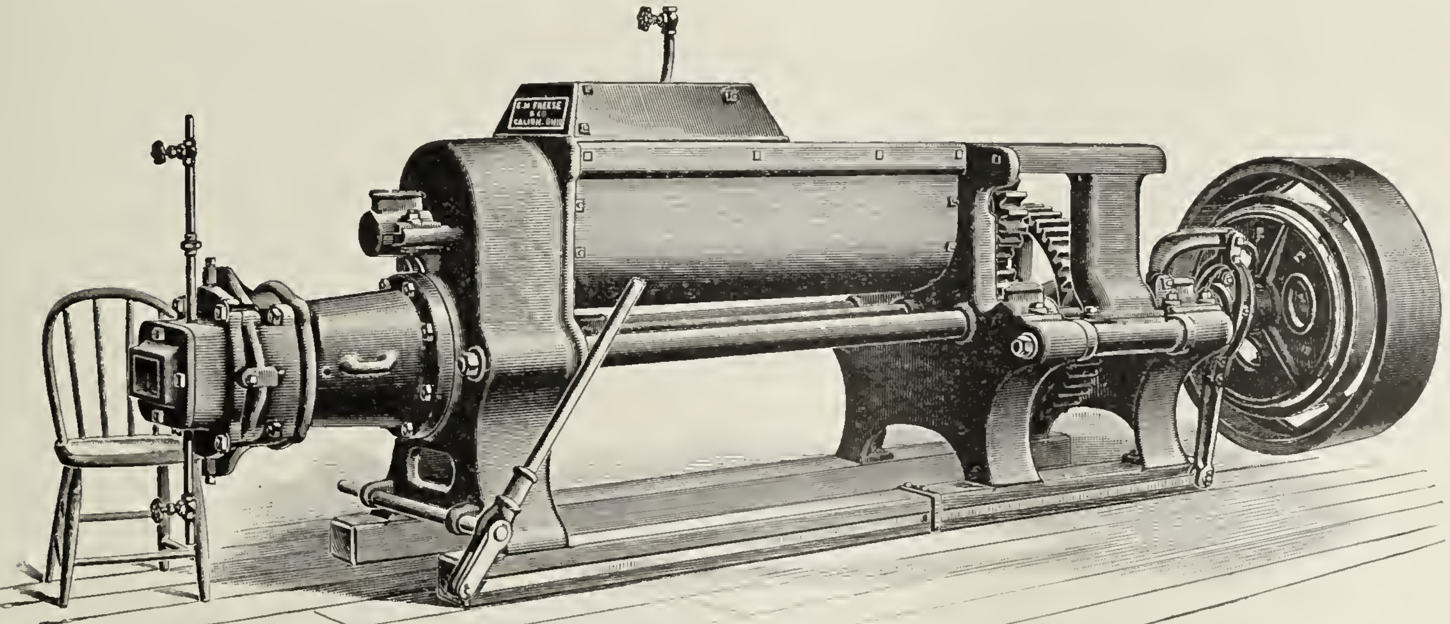
The Original Union Brick Machines


MANUFACTURED BY
E.M. FREESE & CO.
GALION OHIO U.S.A.

SPECIAL SIZE.
Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.
Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

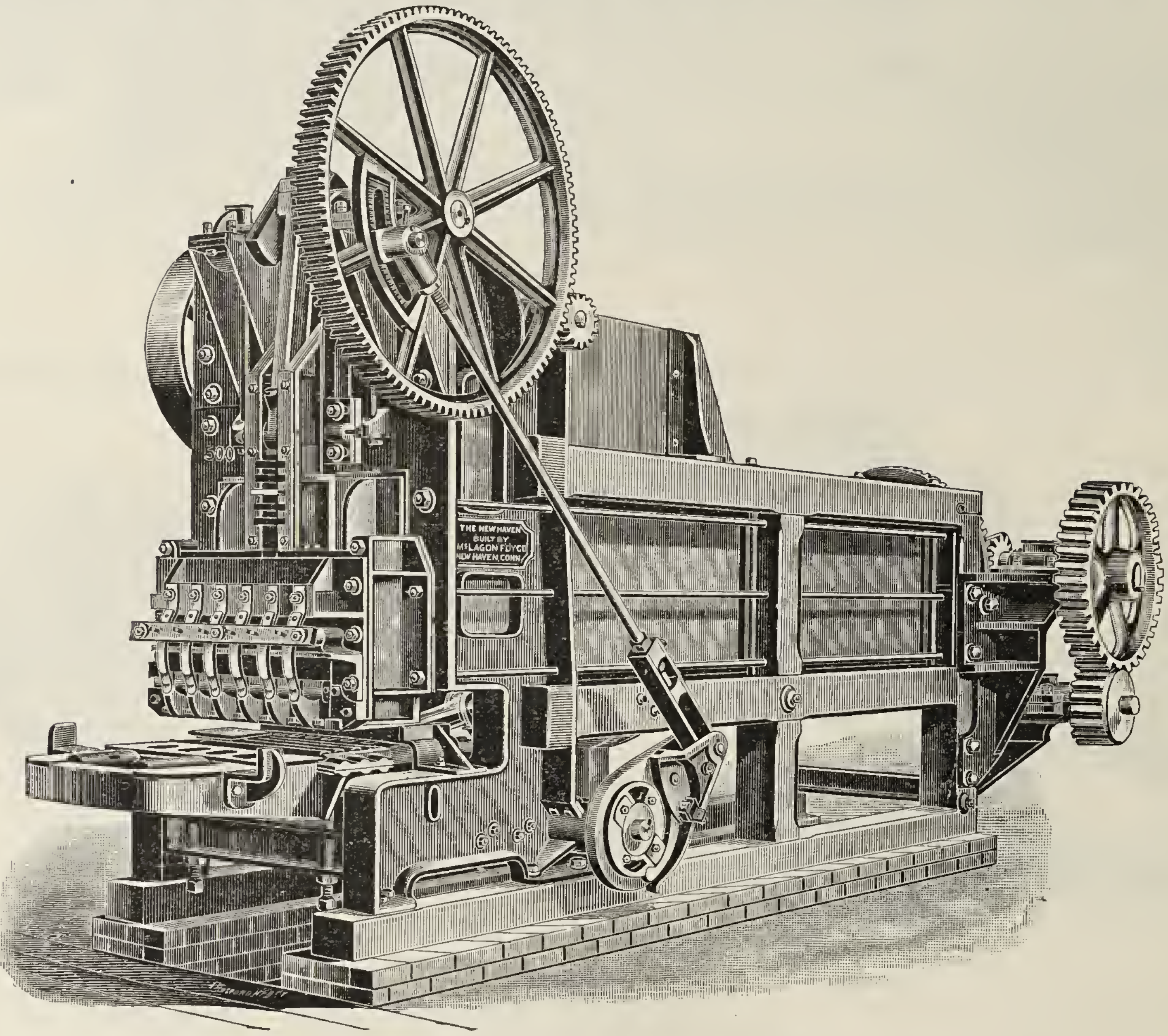
No separate Pug Mill required.

No. 2 SIZE.
Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

First Machine Nine Years Old, Second Machine Four Years Old.

REPAIRS LESS THIS YEAR THAN FOR PAST THREE YEARS.



WESTFIELD, MASS., Oct. 13, 1898.

THE EASTERN MACHINERY CO., New Haven, Conn.

Gentlemen—Our machines have given excellent satisfaction this season, and **the amount expended for repairs has been less than for the past three years.** We can only repeat what we have said many times before. In our opinion your machines are the best on the market. Yours truly, WESTFIELD BRICK CO.

This shows how well they wear. They will serve you just as well.

The Eastern Machinery Co.,

NEW HAVEN, CONN.

DO YOU WANT THE

BEST BRICK DRYER?

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel. It is a fuel saver and hence a money maker.

If you want the best and most economical brick dryer don't fail to get our prices. If you want a cheap dryer, its no use to write us for we don't build that kind.

* * *

Read what H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE: 60TH AND HAVERFORD STS. TELEPHONE 147, W. P.

H. C. CARROLL & SONS,

Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS:
57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

* * *

The Cummer Clay Dryer is now in successful operation at many places in the United States. Like our brick dryer it is fully guaranteed to perform its work in the most effective manner possible and in any desired capacity. The **Cummer Dryer** succeeds where others fail. It will afford us pleasure to demonstrate its superiority over all other dryers.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell you troubles to"

The F. D. CUMMER & SON CO.,

CLEVELAND, OHIO.

An "A. B. C." Brick Dryer

WILL SOLVE YOUR DIFFICULTY.

Send for Catalogue.

Have you been drying bricks on racks in the open air and found it necessary to shut down for dry bricks, when the sun refused to shine? Have you gone to the yard in the morning and found the racks collapsed and two or three days' run of half dried bricks all mixed up in the debris and spoiled?

Have you ever moved a lot of pallets of green bricks to the north side of the racks because the south wind was beating the rain in on them, and after you had done this, did the wind change to north just about dark?

Possibly you have a dryer that was guaranteed to dry a certain number of bricks every day, and you can only make it dry half that number.

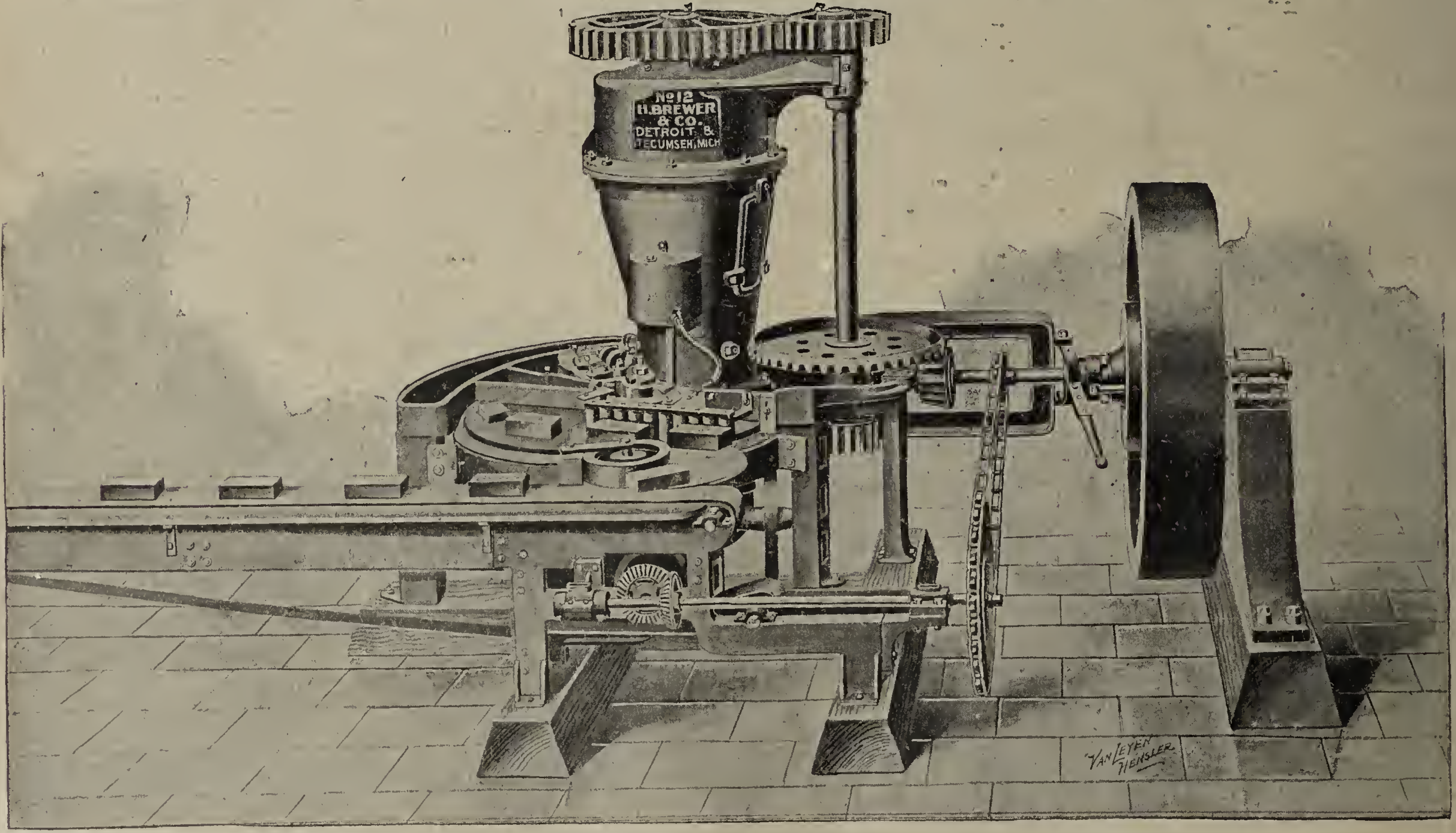
Perhaps your bricks are costing too much to make, your competitor is cutting prices, and you can't see how he can do it.

Perhaps the world looks dark to you for one or more of these reasons.

We can help you. We have helped others. Why! Their names would fill this page.

Can we serve you?

American Blower Company,
DETROIT, MICH.



No. 12 Mold Press Brick Machine, capacity, 40,000 to 50,000 standard size brick per day of ten hours.

H. BREWER, Tecumseh, Mich.

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THE CLAY WORKER

A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS.
INCLUDING BRICK TILE TERRA-COTTA SEWER PIPE POTTERY ETC.

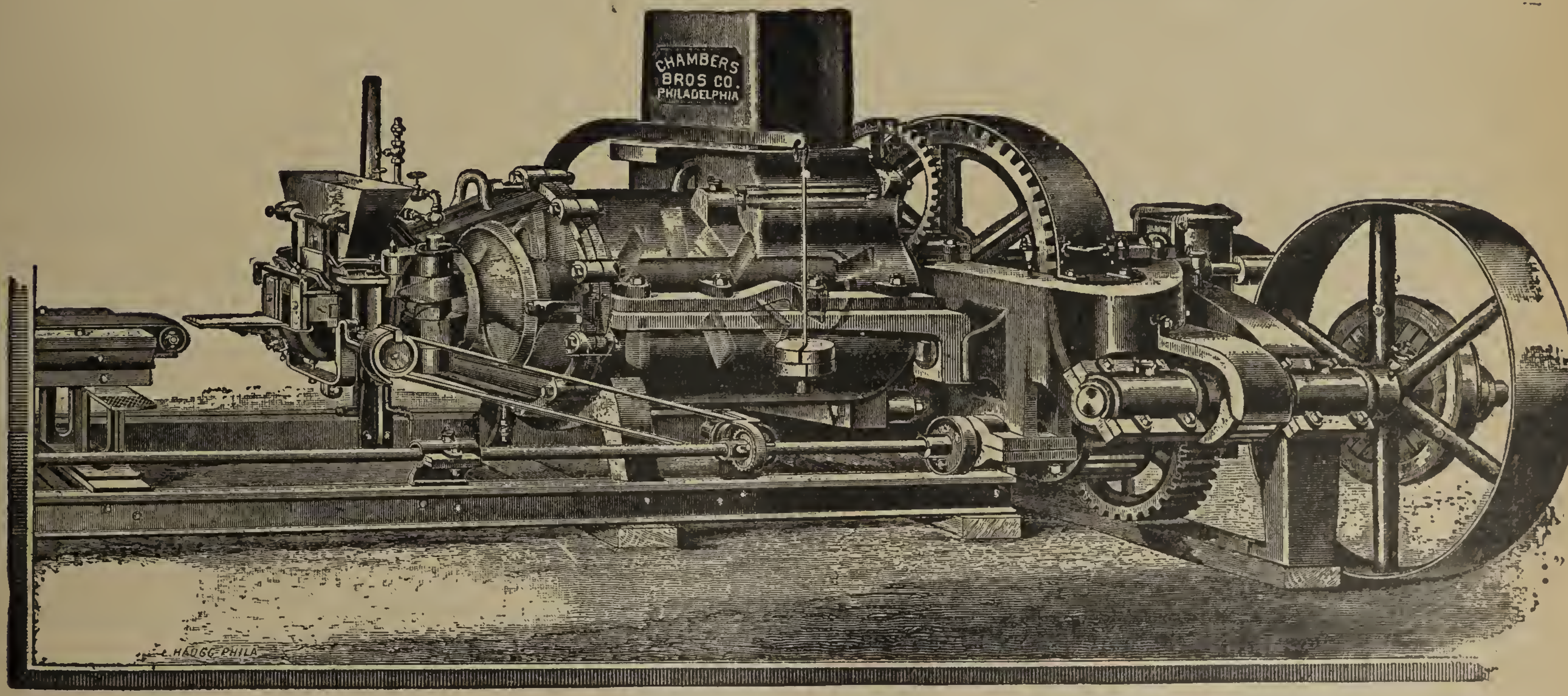
T. A. RANDALL & CO., PUBLISHERS.

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXI, No. 4. INDIANAPOLIS, IND., APRIL, 1899. $2.00 a Year in Advance.
CHANDLER SC. INDPLS.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.
We aim to Build only the Best in its Class.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

STEEL CARS.

WE BUILD a full and complete line of **Steel Dryer** and **Dump Cars** and believing that the users of these goods are fully convinced, many of them by bitter experience, of the fallacy of using the cheap cars with which the market is flooded, we confine ourselves exclusively to the building of strictly high-grade cars, to stand the rough usage to which they are necessarily subjected. However, the equipment of our plant enables us to name extremely low prices upon Cars of any description and to make prompt delivery of any orders entrusted to our care. We respectfully solicit your inquiries.

CLEVELAND CAR CO.,
148-152 Scranton Ave., CLEVELAND, OHIO.

Mention the Clay-Worker

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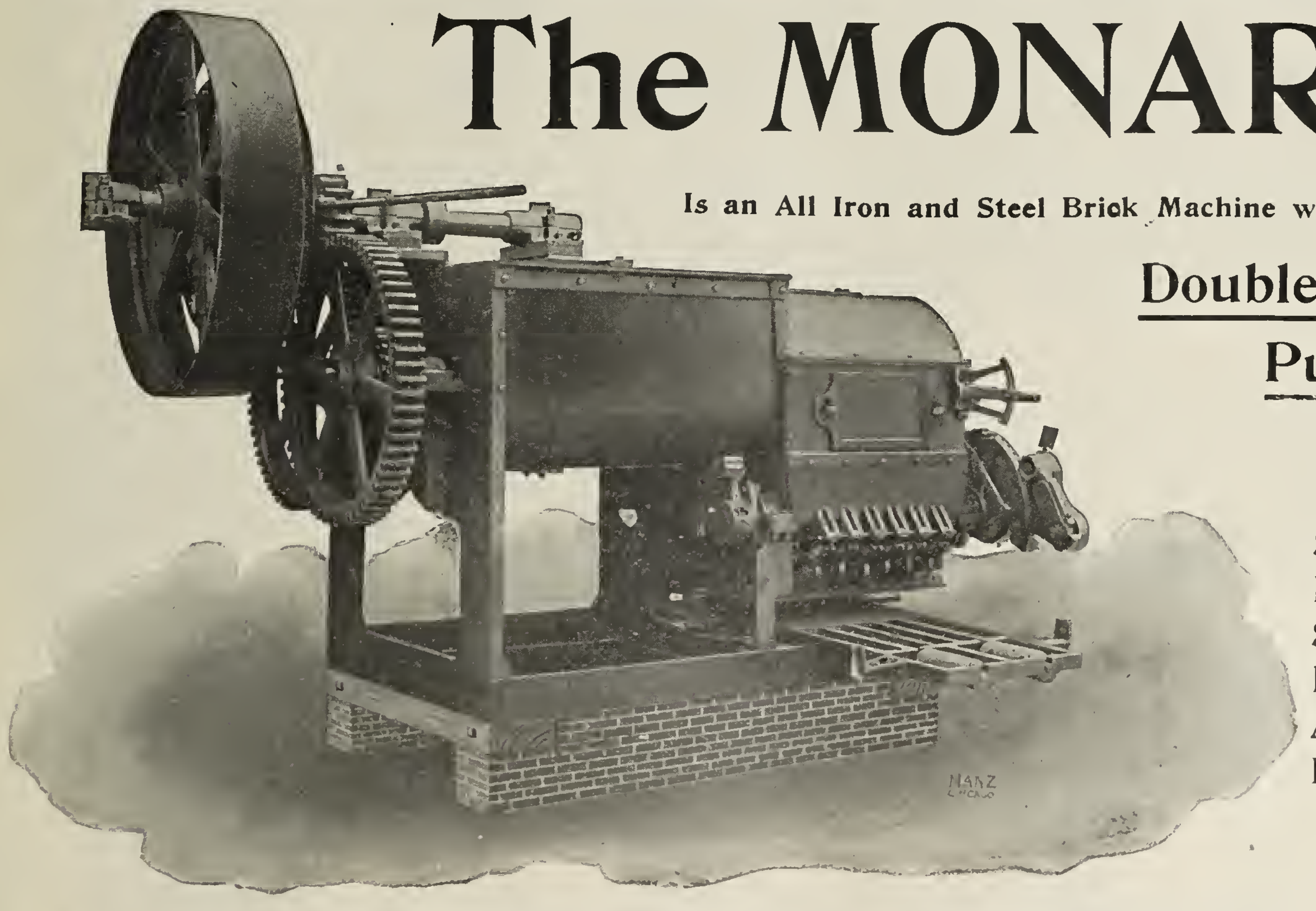

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SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

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Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for 1898 Catalogue.

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A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

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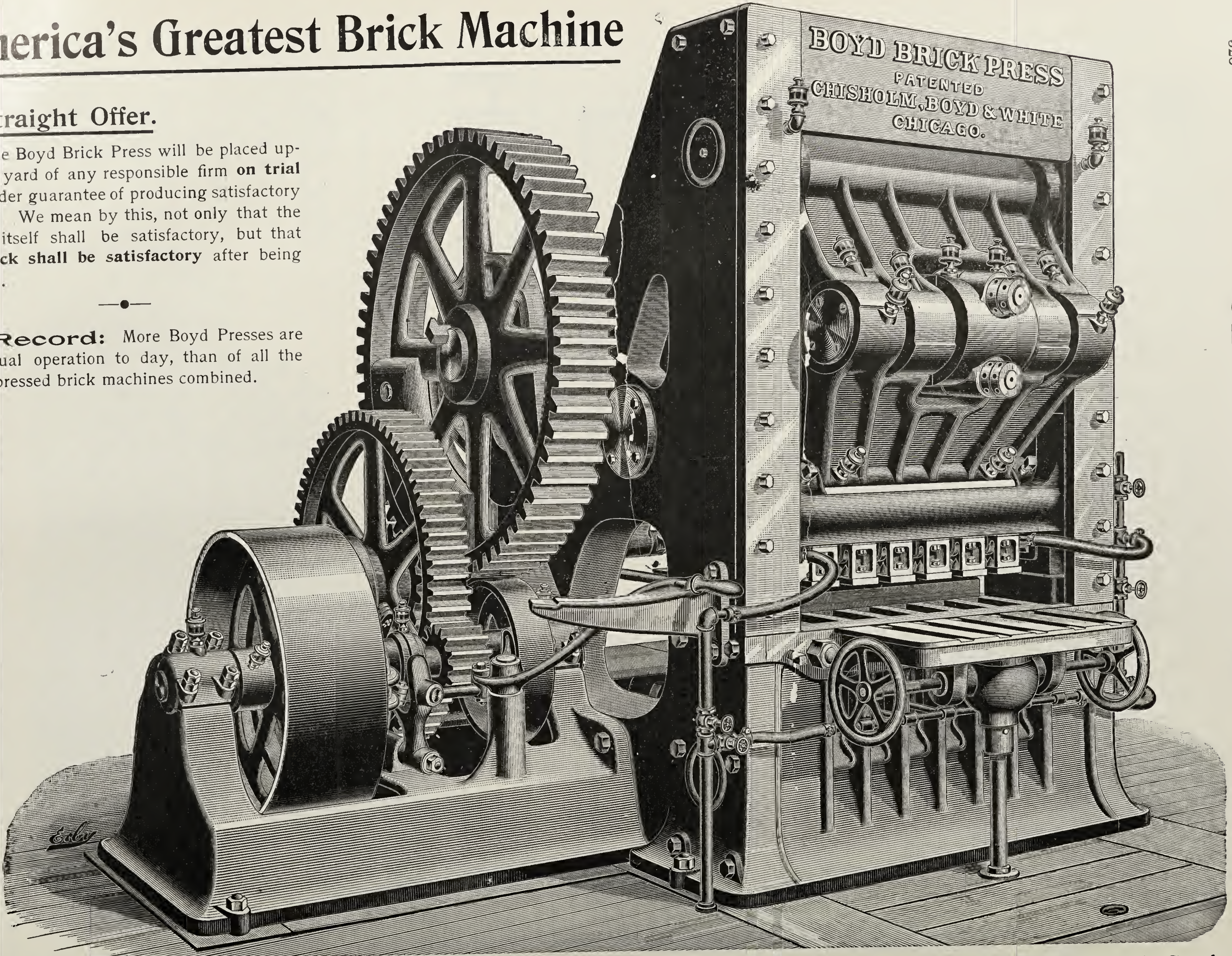
Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



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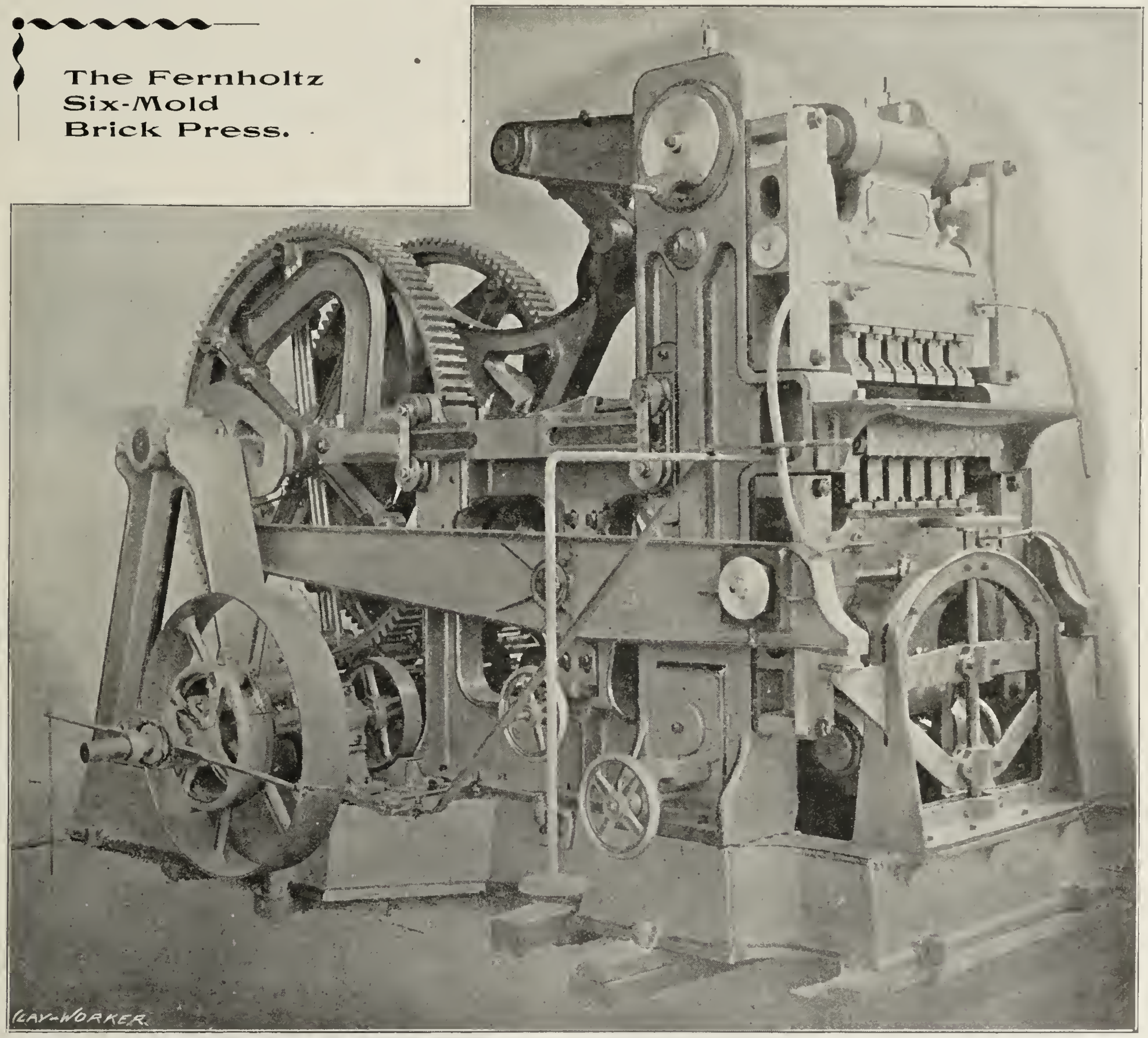
The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6-mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mold which is generally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible. We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**



The Fernholtz Six-Mold Brick Press.

The opinion of those using our press and full information on application.

The Fernholtz Brick Machinery Co.,

1214 and 1216 Poplar Street, ST. LOUIS, MO.

The Wonder Clay-

IS UNEXCELLED for the manufacture of **BUILDING BRICK, PAVING BRICK,**
Wonder Machines are made on original and correct mechanical lines. Second, they
known to expert mechanics. Hence their superior wearing qualities and large
Wonder Machines offer several distinct advantages: Owing to their peculiar
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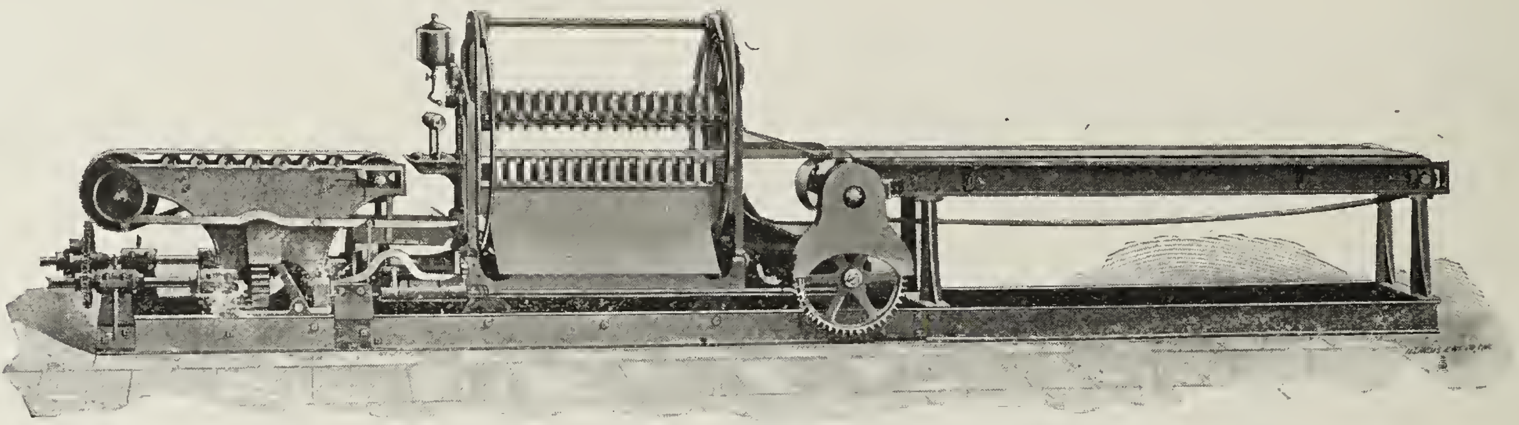

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OUR NEW COMBINED END AND SIDE CUT CUTTING TABLES ARE WONDERS TOO.

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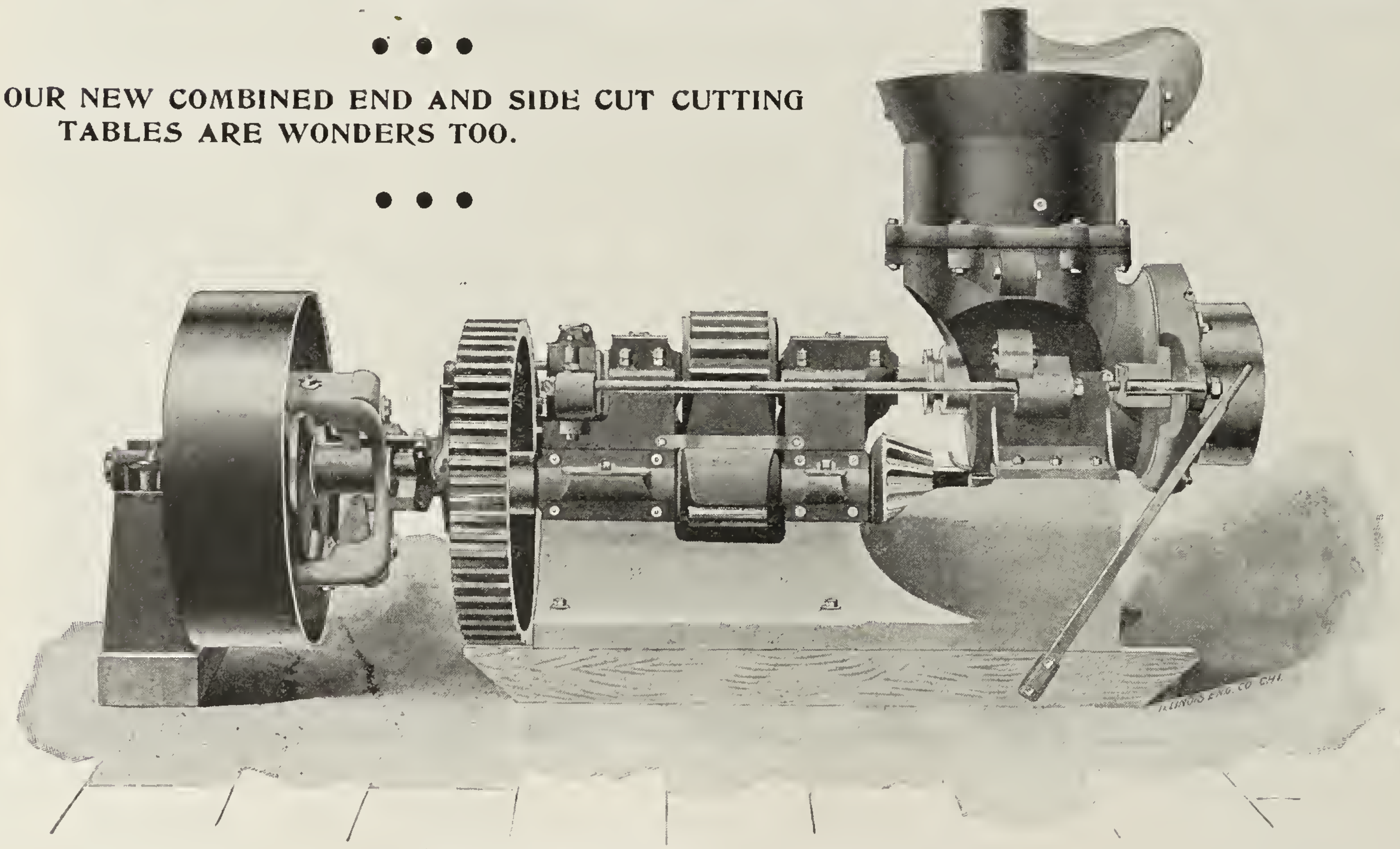

The Wonder Tile Machines, made in two sizes.

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Chicago Brick Machinery Co.,
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Working Machinery

HOLLOW BRICK and DRAIN TILE. This is due to several very good reasons. First, are made of the very best material; and Third, in the best and most substantial manner capacity.
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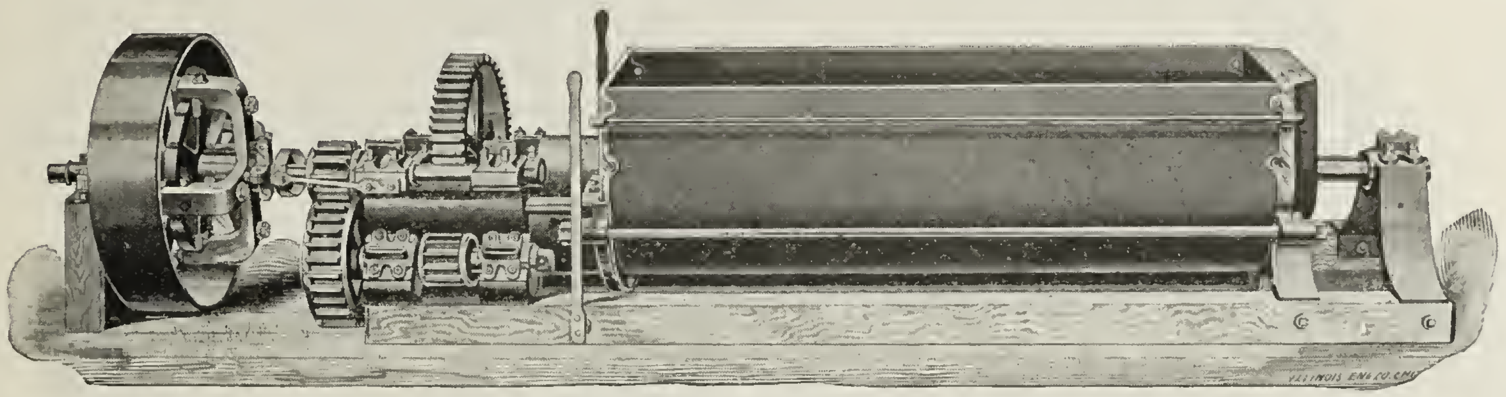
Crushers, Pug Mills, Clay Elevators, Screens, Barrows and all Brick and Tile Yard



Open Top Pug Mills of any size and capacity desired.

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WONDER BRICK AND TILE MACHINES WILL WORK ANY CLAY THAT IS ADAPTED TO THE STIFF CLAY PROCESS.

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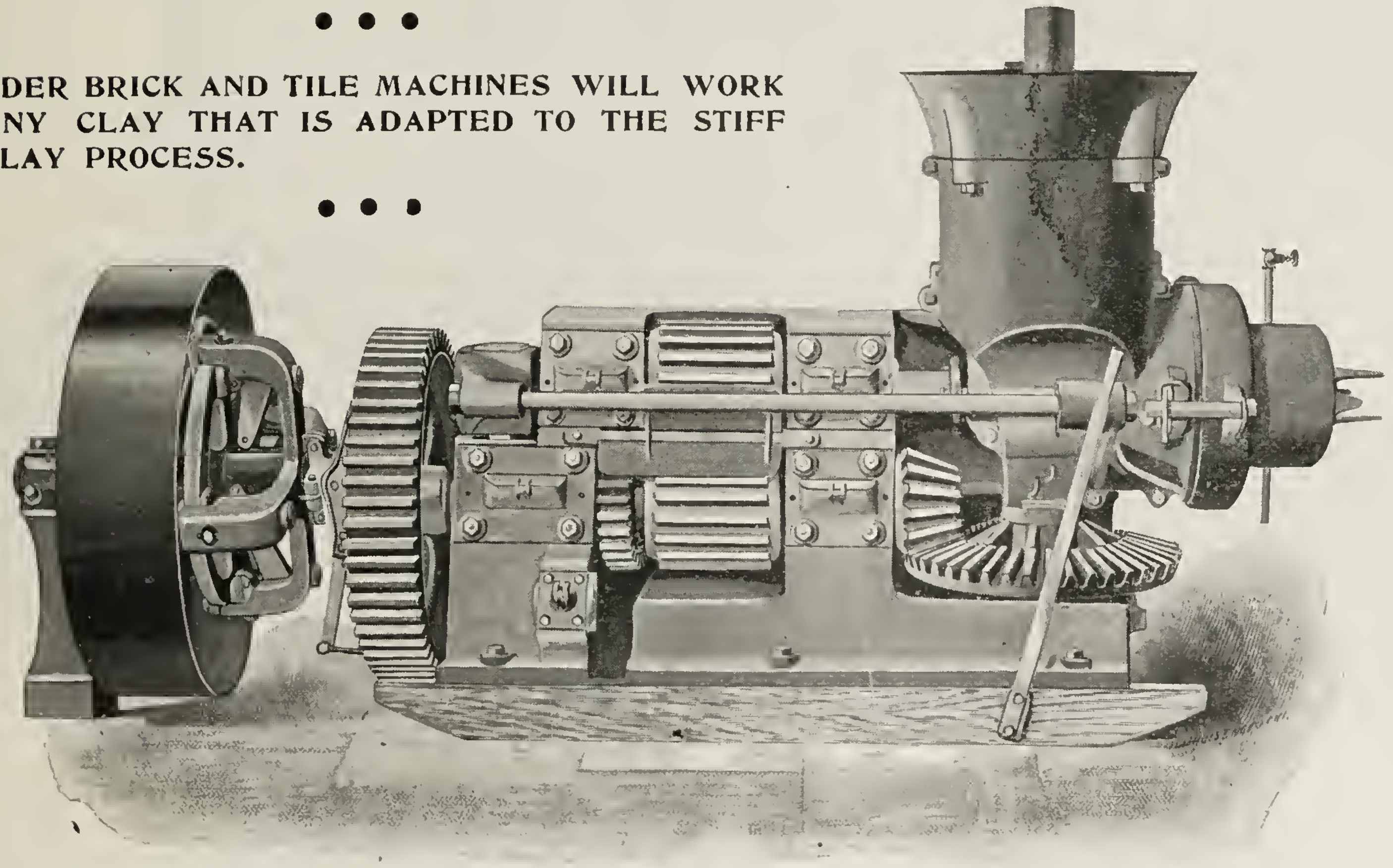

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Wonder Brick Machines, made in four sizes, with capacity ranging from 20,000 to 100,000 brick per day.

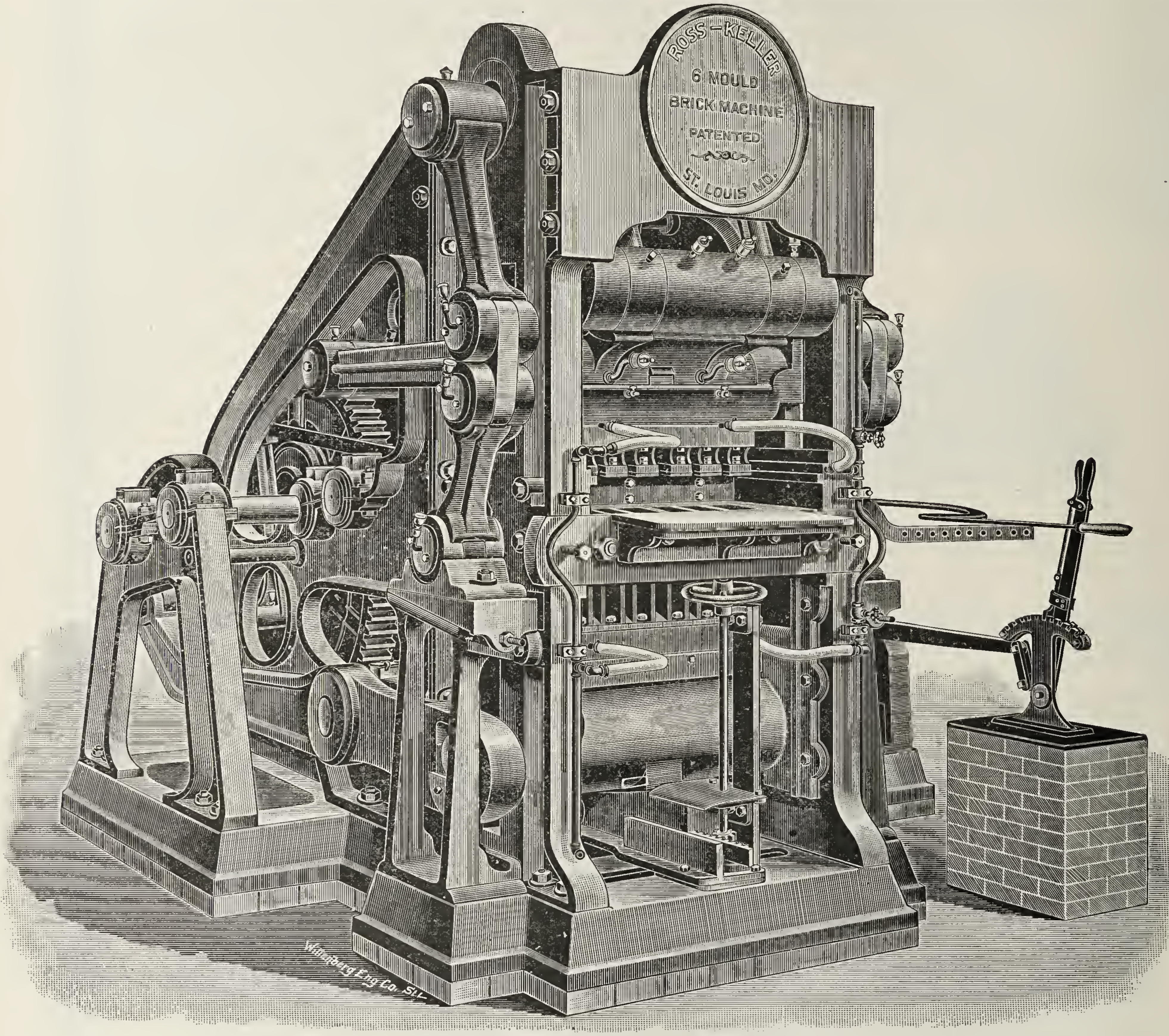
MANUFACTURING CO.,
Frankfort, Indiana.

The Latest Improved

Ross-Keller TRIPLE PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

BRICK SET IN KILN DIRECT FROM MACHINE.



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has **twice** the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made. Press is guaranteed for two years against breakage.

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We Insure Your Product

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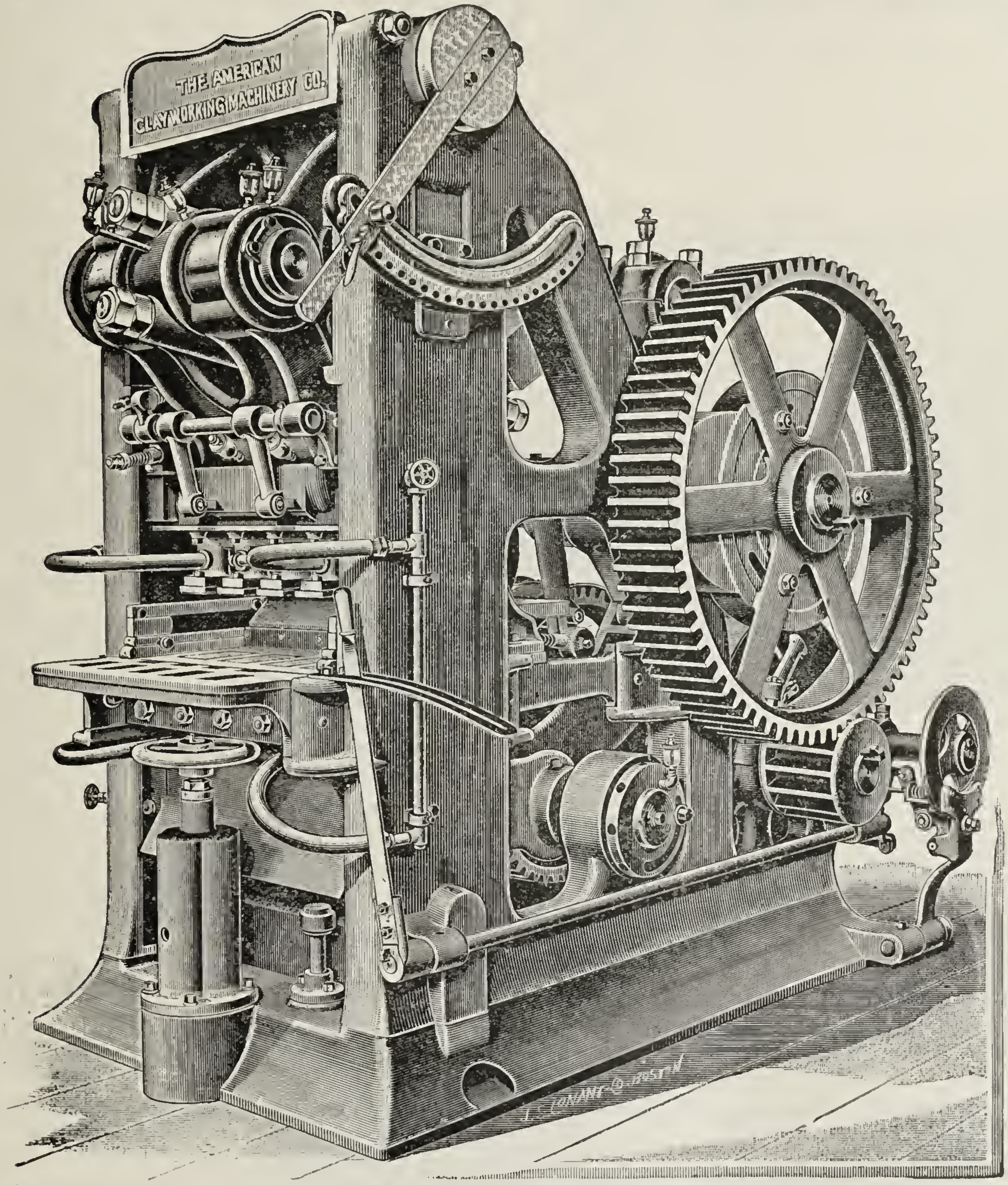


FOUR-MOLD PRESS BRICK MACHINE.

OUR recognized and acknowledged superiority of machinery in the stiff-mud line is maintained in the excellence of our machinery for the manufacture of dry press brick. There is no line of machinery for this class of manufacturing that will equal ours. It combines great strength, simplicity, durability and ease of operation. There are no weak or delicate points to annoy and pile up expense in delays and repairs. There is an increase in output and quality from our machines. Its increased quality, which makes you reputation, and increased quantity, which puts more dollars to your credit in the bank. If you want rightness in machinery—the lasting kind—write us for particulars.

THE MACHINERY THAT NEVER DISAPPOINTS

The American Clay-Working Machinery Co.,
BUCYRUS, OHIO, U. S. A.

UNBIASED TESTIMONY

IS THE KIND THAT COUNTS.

What a manufacturer says about his own product may sometimes be open to doubt. It would be a weak sort of man who didn't "stick up" for his own handiwork. But what **others** say—that's another story. We are willing that

The Standard

Brick and Tile Drier

Should be judged by its record as made up by users. On this sort of testimony—the kind given below—"we rest our case."

Ensley Brick Co., Ensley, Ala.

Ensley, Ala., December 9, 1898.

The STANDARD DRY KILN CO.,
Indianapolis, Ind.

Gentlemen:—We are very much pleased with your Drier—it does even better than you guaranteed.

This is very gratifying to us as our first experience with Driers was very discouraging; in fact, a failure both as to drying and handling our material. The great mistake we made was in considering a proposition from and awarding the contract to a party who made us a lower price than yours, on our first Drier. In buying the second time we did not consider a bid from the first builder at all. Now we see the difference. There is no comparison between the two Driers, neither in equipment, workmanship or system.

Respectfully,
ENSLEY BRICK CO.,
H. L. Finkler, Sec'y.

Indianapolis, Ind., Nov. 3rd, 1898.

The STANDARD DRY KILN CO., Indianapolis, Ind.

Gentlemen:—The eleven track Steam Drier you put in for us at our Martinsville plant has been in use nearly one year, during which time it has been subjected to numerous and trying tests. Beginning as we did in the Winter with the clay wet and sloppy, and the shale full of frost, our soft mud brick entered the dry house cold and clammy. Under the scientific yet common sense method of distributing the heat and nature's own way of carrying off the moisture, our brick came from the Drier, sound and thoroughly dried and free from checks or fracture.

We dry our soft mud shale brick in 24 hours and our brick made from clay in 48 hours. The Drier is easily controlled, in fact it runs itself with no expense so far, for repairs or renewals; all that is required is steam sufficient to keep the temperature at 120 degrees at the receiving end, and about 165 degrees at the discharging end.

The cars we purchased of you with Cage Roller Bearings and well supported and braced steel racks, without doubt are far and away the best and most practical we have seen or tried. In fact the Drier with its outfit is to us an agreeable surprise, in the matter of durability, practical use and expense on account of repairs.

Yours very truly,
THE ADAMS BRICK CO.,
J. C. Adams, Pres't.

The STANDARD Is the Drier that does not disappoint. It invariably does all and a little more than is claimed for it. It satisfies in every instance.

Our Catalogue and much more "Unbiased Testimony" can be had for the asking.

The Standard Dry Kiln Co.,

186 South Meridian Street. ***INDIANAPOLIS, IND.***

THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. XXXI. INDIANAPOLIS, IND., APRIL, 1899. No. 4.

Written for The Clay-Worker.

OLD BRICK BUILDINGS IN ENGLAND.

Homes of the Common People of the Mother Country—Brick Inside and Out—Cosy and Comfortable Though Hundreds of Years Old.

I RECOLLECT seeing, some years ago, an advertisement on a tea wrapper, the first two lines of which were these:

> "'Tis many hundred years ago
> Since first I was observed to grow."

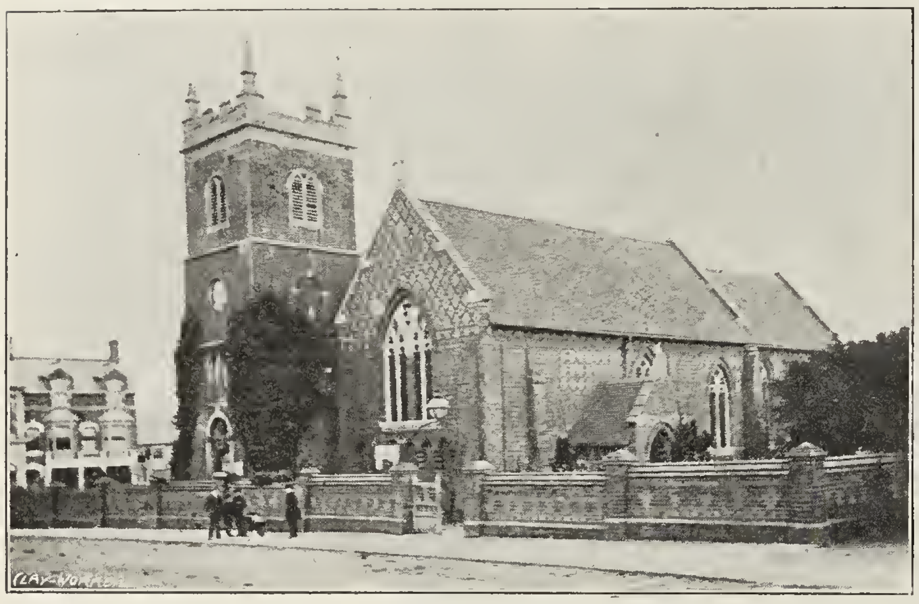
No one would ever ask, I suppose, how long stone has been used for building, supposing that it has always been so used. And there are some people, concerned only with the immediate present, who never exercise the least thought as to how long bricks have been used. Others there are who suppose them to be a modern invention, and hence untried. The few fragments, therefore, which I have to set down will, I trust, fall into the hands of the latter class.

ANCIENT BRICK HOUSE WITH THATCHED ROOF.

I doubt not that if one, knowing little or nothing about brick, were solicited by a brick salesman, he would ask, how long will they last? That means how long will they wear, compared with other building materials, such as wood and stone. This is a question which the American brickmaker is learning year by year to answer. He must, however, draw his evidence from other lands. Circumstances—better nature—have made it so. While ample timber remains close at hand other building materials will not be used, but, just as sure as there becomes a scarcity of this article, other materials will be used. A scarcity of that article for wholesale building purposes is already felt. Men have directed their attention to something else, and that something else is clayware. One is astonished when he reads magazines published in the interests of clayworking to learn of the enormous output of brick factories. Here and there over the land we read almost every week of some newly chartered brickmaking company. All this shows an extraordinary demand for this kind of building material. But, after all, there is an impression, especially among the rural folks, that a house made of wood is as durable as one made of brick. Some day the demand for brick in rural building is going to be large, but that time will not come till the feeling that wood is as good as brick is dispelled from the people's minds. No doubt the high price of timber will hasten it. So far, I believe, little has been done to educate the ruralist to the use of brick. If in some way it could be brought home to the farmer that a brick house is superior to a frame one, and brick stables and homes and sheds are very much better than wooden ones, and in the end cheaper, I am confident that we would see what we now very rarely see, a brick farmhouse, surrounded by a good set of red brick buildings. This would be a picture seen at almost every turn in the country of which I am writing. It detracts, perhaps, from the naturalness of things around, but it adds a picturesqueness. Very few farm buildings in the British Isles are now made of wood. Brick, brick, brick on every hand. Large public buildings, however, are mostly built of stone.

I have traveled over a good part of England and Scotland, and I never saw a wooden house, or what we Americans call a frame house. In Scotland they build of stone; in England of brick. Not only do the English use brick in the construction of their buildings, but most floors are made of the same thing.

In the accompanying picture you see an old cottage with a thatched roof, the straw being from eighteen inches to two feet thick. The floors on the ground floor are made of red brick. I do not say they are better than board floors. In the winter they are very damp, except where the house stands on very dry soil, and very unhealthy. I have often thought that the English who live in such houses for years and do not have rheumatism must be very hardy. I am rather loath to say much about the old house in the picture, because the people living there allowed me to take them in the picture. Should they read what I would like to say here, I fear their hospitable doors would be closed to me when I go that way again. I will say, by the way, that the quaintness of the outside is only excelled by the neatness and cleanness of the inside. The old chimney corners are the spots sought for by the bairns on wintry nights. I have been in hundreds of English homes, but I never yet saw a stove. Grates are used universally. For cooking purposes there are kitchen ranges fulfilling the same end as a cooking stove. As a rule the ceilings are not more than six feet high, which makes it easier to warm the houses. I wish I might elaborate on the thatched roof. I fear the British people do not realize what they are fast losing. No new homes are being thatched. All are being slated or tiled. That means hotter houses in the summer and colder ones in the winter. How cozy and warm those bedrooms are in the winter under those thatched roofs only those who have tried them know. It is true one is tormented sometimes by a stray flea, but what is that, compared with the charms of dwelling under a thatched roof in


A Parish Church and Brick Fence.

> "Sweet Auburn, loveliest village of the plain,
> Where health and plenty cheer the laboring swain?"

All "Sweet Auburns" of Europe are made up of just such rustic villas as you see above. It is a charming sight to see, from a hill, a village of thatched cottages on the plain.

For the age of these houses I rely upon what the villagers themselves say. They are not, it is true, made of strawless Egyptian bricks, but the brick in them might say, in the words of the tea advertisement,

> "But many hundred years have flown
> Since first my properties were known."

They date from the age of Queens Mary and Elizabeth, in the sixteenth century, making them from three hundred to four hundred years old. I can readily believe that many of them now standing are fully that old. In the brickwork of the house pictured may be seen a framework of wood. Nearly all houses of this type have a similar frame, mortised and generally made of oak wood, indicating that English oaks were more numerous in those days than to-day. The frame is wonderfully strong; it is the strength of the house. Often the walls are only the width of a brick thick. The frame is as easily detected inside as outside in many houses. As a rule, however, the insides are plastered and either whitewashed or papered. Oftentimes, as in the picture above, they are whitewashed outside. It is a shield to the bricks, but how long that practice has been common I could not learn. It is a rare thing that a cottage of the above type has two full stories. I remember very vividly staying over in one of them for the night. Being accustomed to walk upright, and, though I am only of medium height, I struck my head against a beam in the ceiling of the bedroom the first thing, and the next step almost brought the same throbbing pate in collision with the top of the doorway leading into an adjoining room.

To look at some of these old houses one would think they will last another three hundred years. The bricks, on examination, are found to be well burned, of a good red color, and of similar dimensions with our modern brick. One sees other houses, in which this strong wooden framework is absent, almost or quite as old as the others. They were well built. The mortar was far superior to much that is made to-day. The years some of those thin walls have stood is wonderful. They have stood the life of two or three frame houses.

Just a word about the photograph itself. I left the people of the house after some days still wondering how the bonnie lass and her parasol got into the thatch of the roof. Her position, I think, should be commended, though the photograph is nothing of which to brag.

AN OLD BRICK CHURCH.

The second photograph is of a parish church. Brick churches are rare things in England. Nearly all are made of stone. Having gone through the above church, worshiped in it, and seen it from all sides, made me particularly desirous of obtaining a picture of it. Inside the walls are as the mason left them. The barrenness is a little depressing at first, but, taking a seat and looking all around, the depression wears away as you see from the nave the beautiful altar and plain but becoming reredos. One might easily suppose the mason's hand had but recently left the brick. The tower, while not imposing, is the best brick tower I have seen. It shows no signs of age or disintegration, though it was built in the year 1726. The church, there is reason to believe, is very much older than the tower, yet the brickwork does not make it evident. The church is in the parish of Fenny Stratford—a quaint little town indeed—one of the old stagecoach stopping places. It is on the famous old Roman road called now for many centuries Watling street.

I saw while in London an old brick schoolhouse, but did not photograph it, built and established by King Charles himself. Its walls are firm and strong, after standing 350 years. The weather, of which London has seen a good deal in those centuries, has not defaced the walls at all. Work in those days was done very thoroughly. "There were giants in the land in those days."

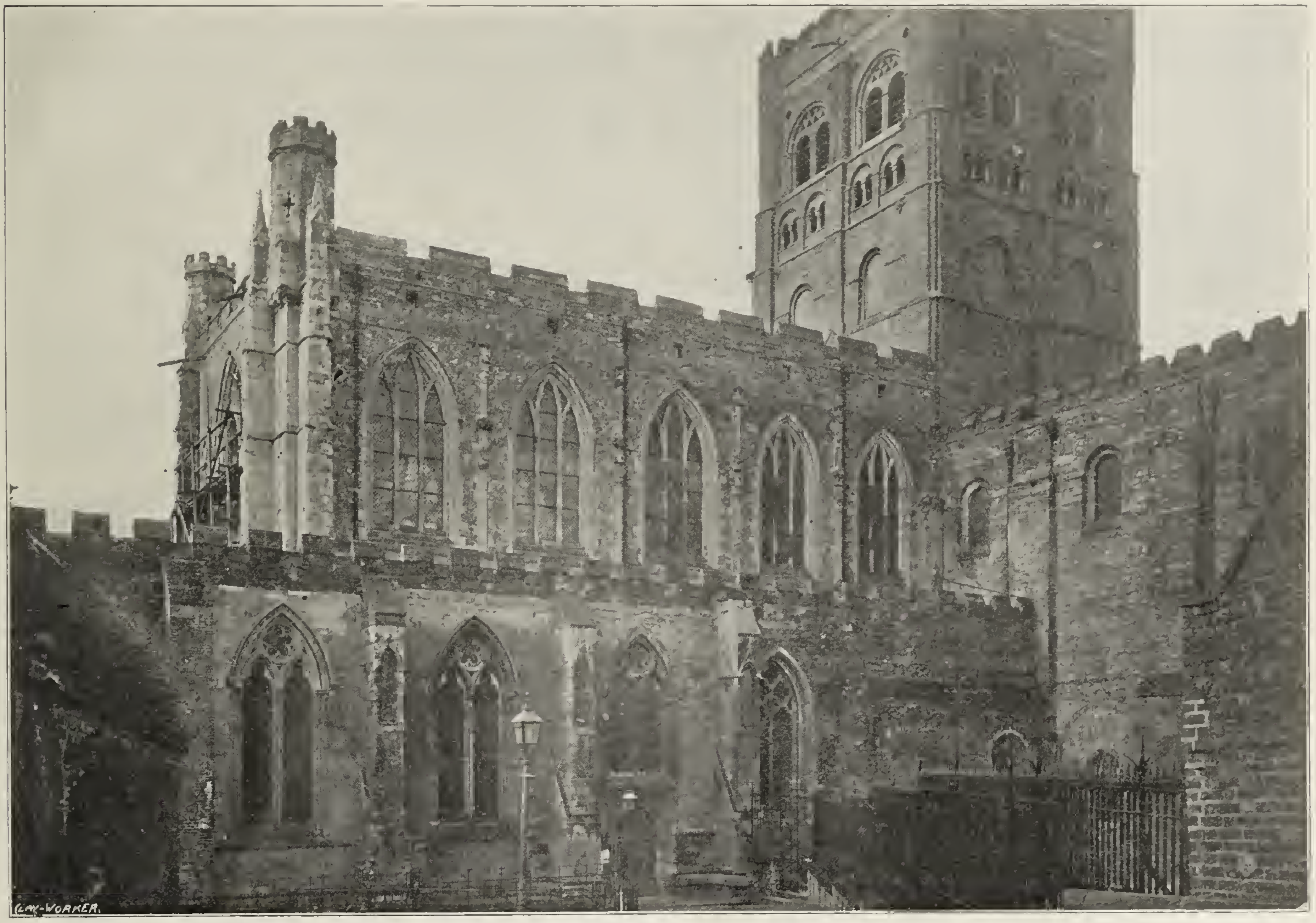
What we need to-day in America is not better brick, but better brickmasons. Our bricks are as good as those made by the Romans centuries before the Anglo-Saxons became a nation. We live too fast to do things well. After awhile something or somebody will call a halt and admonish us to go slowly. Then we can build our edifices and do work which shall redound to the glory of the nation.

I have spoken of Roman brick. Here they are in evidence In the third picture you see one of the most interesting buildings in the United Kingdom of Great Britain. It is St. Alban's Cathedral, named, like the ancient city in which it stands, in faithful memory of the first martyr to the Christian faith in England. It is a venerable old pile of masonry, and, as I look at it and my notes, I scarcely know where to begin. Were I not writing to prosaic readers—all readers of scientific literature are prosaic—I should be inclined to beg your indulgence to say a little about the environments of this truly noble edifice.

When Julius Caesar landed in Britain, in 55 B. C., and forced his way up the country, he found, about twenty miles north of what is now the metropolis of the world, a very strong British fortress. Strength of arms overcame the native tribes, and a Roman city soon began to rise above the ruins of what was one of the oldest British strongholds. The Romans called their city Verulamimu, and for three hundred years it bore that name. From that ancient name that famous family from which the illustrious and far-famed Francis Bacon came got its name. Here that great man received his tuition and spent much of his life, and, according to his pious wish, was buried here by the side of his mother in one of England's oldest parish churches. The vicissitudes through which this wonderful old place has passed are of the greatest interest, both historically and archaeologically.

But of its modern name: In the year 286, as the venerable historian, Bede, tells us, a certain pagan convert named Alban, a native of the old city, who had served in the Roman army seven years, was led forth to be martyred for the faith. Years afterwards the name was changed from Verulamium to St. Albans, for this good pagan convert has long since been canonized. Since that time others have given their lives in the same cause. It has been the scene of many national events. Two famous battles were fought there during the wars of the Roses in 1455 and 1461; but not of least importance among the historical interests of the city is the fact that it was one of the two municipia of the Romans. In 54 A. D. it was so made, and to this period let us turn our attention.

In the northwest portion of the ancient city is the site of a Roman brick field. What the brickmaking facilities were we do not know, but that the output during Roman occupation was large is unquestioned. What is left to us demonstrates the good quality of their work. As the visitor approaches the cathedral he is struck by the strange appearance of the wonderful Norman tower. He is surprised to discover that it is built of brick. It is the only cathedral tower in England, I believe, built of Roman brick, and, as far as I have learned, the only church tower at all built of Roman brick. The brick two thousand years old, serving in more than one building, have stood the disintegrating influence of frost and rain, and yet look as good as new. A Roman brick is peculiar in shape. It reminds one of a flooring tile or slab more than of a modern brick. It is at least fifteen inches long, nine inches wide, and only one and a fourth inches thick. The strength of a building constructed of such material is only understood where one can put his hand upon the date of its erection. This imposing tower was built during the reigns of William the Conqueror and William Rufus, his son, begun in 1077 and completed in 1088. It is one hundred and forty-four feet high and nearly fifty feet square. In the Middle Ages it had a lofty lantern—similar to that on Ely Cathedral and that on the Cathedral Church of St. Nicholas in Newcastle-on-Tyne—resting upon the summit and high turrets at each of the four corners; but since that has been removed its Norman simplicity comes out in all its original plainness. But the tower is not the only part in which Roman brick are found. One can scarcely turn his head without seeing whole patches of such brickwork on the walls of the cathedral proper. There is no reason to disbelieve that the whole church was once made of these ancient brick, but in the many enlargements which the cathedral has had a great deal of the original work has been lost. What an enormous number it must have taken! Fancy a church 550 feet long and proportionately wide, with walls thick enough to make a footpath through them. Such a build-



St. Alban's Abbey from the Cloisters.

ing was not built in a day, nor were the bricks made in a year.

Perhaps, by looking closely at the picture, you can see the layers of brick in the walls and tower. These bricks were taken from the old city walls and buildings for this very purpose. Before the abbey church was built—for such it originally was—there stood an abbey and monastery on the adjoining spot of ground. The monastery was built by Offa, king of Mercia, in the middle of the eighth century, and the abbey was built at the same time as the church. A part of the old abbey still remains as the oldest grammar school in the kingdom. That, too, is built of brick. It was my pleasure to see while there some excavations made on the side of the old monastery. The monastery was dissolved in the time of Henry VIII, and the income taken to fill his ever-empty purse. The grass has grown over the old foundations for many decades. The object of the excavation was to discover the plan of the monastery and the limits of the foundations. They had discovered the northwest wall and corner, and among these foundation materials were to be seen many Roman bricks. I was going to obtain one to bring back to America, but, remembering that a good many miles were before me and my bicycle, I sacrificed the opportunity.

There are a few other places in this ancient city which I hope some day to photograph and write up. A great many things are coming to light regarding them, and it is hoped that with the strong interest taken in St. Alban's and its antiquities we shall soon know their full history. There is, for example, the oldest inhabited house in England in the older part of the city. It used to be used as a hostelry called the "Fighting Cocks." In many an old print of St. Alban's this strange octangular structure figures. A signboard, I was told, used to be affixed to it with this inscription:

"The Old Round House.
Rebuilt After the Flood."

One can hardly doubt the assertion, though it is evident the brick are not the straw-made ones of Egypt! Its antiquity would give credence to almost any story. It is constructed of brick and timber. There is little doubt that it has ever lacked a tenant since the Saxon period of British history.

Within the last few years the old Roman streets have been traced out, an amphitheater has been discovered and unearthed—the only one so far found in Great Britain—pavements, urns, tesserae, lachrymatories, coins, paterae, etc., have occasionally been brought to light by the plow. There is one other old building which should be mentioned. It is Sopwell Nunnery, built in 1140. All that remains to-day are fragments of brick and flint walls, containing large, square stone windows. It was in the chapel of this nunnery that the unfortunate Anne Boleyn was married to King Hal.

The history of such places which this old city contains is all too enchanting, and it was not my purpose to talk so much about it, but, "when the steam is up, the engine goes." So far so good, however, and these few fragments of the home of the Roman brickmaker, the martyr, the traveler, the historian, the abbot, the nun, the scientist, the scholar, the earl, the lord and the king will not, I trust, be void of interest to the busy clayworker of our own day. THOMAS JENKINS.

TEXAS INDUSTRIES PROSPERING.

The lignite deposits found in some parts of eastern Texas promise to be of considerable value in the development of manufacturing industries in the Lone Star State, says the Age of Steel. Experiments made with this lignite—a form of bituminous coal—show that it is serviceable for smelting and other purposes. It is proposed to start several blast furnaces which have been idle for some time for lack of cheap fuel. Iron furnaces at Rusk are being successfully operated, and the same form of coal can be used with the same advantage elsewhere. It is also proposed to build a 20,000-spindle cotton mill at Rusk, which will also utilize this fuel. This may be followed by others. The grade of Texas cotton is of a high order, and there seems to be no reason why, if cheap coal is available, Texas should not come into line with other cotton-mill States. This means the consumption of large quantities of building brick. So, while the ironworker and the cottonworker is busy, the clayworker has his inning, too.

Written for the CLAY-WORKER.

BUTTON-HOLE TALKS.

THERE WAS REALLY no excuse for my going to sleep, but I had evidently dozed off. To be sure I had been handed along the line from one to another until I had been filled full and overflowing with information. Then, too, I was needing sleep for they had kept at me so late and began so early, even handing me in breakfast, lunch and supper with one of those in line so that I was dead tired, though being tired is, I know, a frivolous excuse. Anyway, I was ashamed that he caught me asleep, and the sad injured look he gave me as he solemnly quit and passed me on hurt me, but I had no time or room for such sensations, as the new arrival hooked on and briskly proceeded.

"You were talking with a fellow last night about the wonderful painting that millionaire paid a fortune for. Now I am no millionaire, but I want to tell you that I have a picture gallery such as your millionaire never rests his eyes on, and painted by an artist that even his money cannot control. He has never seen my pictures, and he never will. He can look at his paint and canvas by the electric light's glare, but they are a very poor imitation of the magic effects in my gallery. The very fact of the arrangement of the hours of exhibition of my gallery precludes his ever seeing it, and, indeed, makes the attendance very exclusive. When these pictures are on exhibition your millionaire is deepest in slumber. The exhibition opens with the earliest peep of dawn, and the pictures are painted in light and air, in mist and water, on cloud and sky. Their lines are designed and their color placed by the hand of the Almighty. First there comes on the black wall of night, the faintest possible tinge of pink. It grows and widens, while the floating clouds catch it up and hold it and fondle it, while they grow and glow in its light and fire. Then the whole heavens vibrate with crimson and gold, untarnished and uncontaminated by the smoke and dust of your polluting city. The distant hills and woods stand clear-cut and dark against the gorgeous colorings, the flaming glories of the morning sky, fresh from the hand of a living God. But still it grows. It widens and extends until, from very fullness, the heavens overflow and cannot hold it, and it spills out into the valley, glorifying and exalting as it travels, until the picture is complete. He who cannot see it, who will not see it, who is too sordid to see it is not worthy of it, and himself is no perfect work of the Almighty. Men go on neglecting these pictures, and wear themselves out with the worry and fret of sordid cares and of dirt and grime and then try to buy a semblance of this in canvas and pigment. This they hang in their dust and smoke-begrimed rooms, and they look at it by artificial light and through sin-soiled and worn-out eyes, and wonder that they miss the exaltation and stimulus of my pictures. My pictures are so free, so accessible, so common that few appreciate and prize them, but they exalt and entrance the beholder and make him better, nobler and broader, bringing him closer to mankind and to his Creator." GATES.

All Phases.

A brickmaker named Moon, living at Lisbon, was presented with a brand new daughter by his wife. That was a new moon. The fellow was so happy that he got drunk. That was a full moon. When taken home he had only 25 cents left. That was the last quarter.—New Cumberland Independent.

Written for The Clay-Worker.

THE VALUE OF ORNAMENTED HOLLOW BLOCKS AS TRIMMINGS FOR BRICK STRUCTURES.

By E. G. Durant.

ONE OF THE REASONS why ordinary brick construction—by which designation we desire to be considered as including buildings erected in the use of common and repressed, or stock brick—has not been more frequently employed for dwellings, lies in the fact of the *sameness* which has characterized buildings of this class, especially where economies must be studied. Wood sills, and frequently wood caps, have been employed or, at best, a segmented or a flat arch or a cap, except in regions where stone is cheaply quarried. Wood cornices and porches have been the rule rather than the exception even in brick houses of the better grade; perhaps not one building in fifty constructed of brick for dwelling purposes, dispensing with wood and substituting stone or hand-made terra cotta for trimming purposes.

If any large advance is made in the future in this important field of building operations which shall increase the demand upon the brick manufacturer for his wares it will be because *a greater variety and a higher grade of ornamentation can be secured without the imposition of an added burden of cost.*

At the annual meeting of the National Brick Manufacturers' Association, held at Pittsburg in 1898, a committee of three was appointed to take into consideration the question of "The Extension of Trade." The appointment of this committee followed the reading of papers, and extended discussions upon "The Economy of Brick Structures as Compared with Wood," "Why Do Some Brickmakers Live in Wood Houses," and "How to Increase the Use of Brick." This committee, after wrestling with the problem twelve months, make a report of "practically nothing accomplished."

At the Columbus meeting of the Association, but just held—the feeling of need remaining—a new "committee of the whole" was appointed, with the editor of the "Brickbuilder" as its chairman, to take up the same question, to be known as "The Committee on Trade Relations."

It is hoped that this paper may serve to point out *one way*, and that a very important one, by which the desired end may be reached.

It is noticeable that brick are rarely employed in towns and villages save for the construction of public and business buildings and for foundations and chimneys; and in most sections of the country not even for such buildings, except as corporation laws require something to be used aside from wood in certain prescribed fire limits.

In the discussion referred to as taking place at the Pittsburg Convention, it was noticeable that the attention of the speaker *was wholly given to the use of brick for dwellings;* this was quite natural, since probably an average of fifty or more dwellings are erected where there is one public or business structure, therefore, to largely increase the demand for building brick, this field is the one of largest promise, and must be invaded, and, to our mind, there is little use in attempting to make any large advance in this particular field, so long as the conditions remain as in the past.

To make plain what we understand to be the "conditions," let us suppose a case. Mr. A. lives in a place where excellent common brick can be had at a reasonable price. He is alive to their value as furnishing the best building material that can be had where comfort and the coming years are taken into the account, and permanence and protection from the elements are duly considered. He is about to build a house, and in going to his architect for plans, he clearly indicates his preferences for brick as the material to be employed.

The architect is advised about how much money his client is willing to invest and what amount of room; what conveniences of plumbing, etc., and what the general character of the interior finish.

If the architect has a sufficient sum at his disposal to enable him to gratify his own taste and to meet what he knows will be the demands of his client for the artistic on the exterior, he will cheerfully proceed on the lines of his client's wishes regarding brick. But if he finds the amount designated is insufficient to meet this demand in the use of brick, he will more than likely, failing to secure a larger money appropriation, present alternate plans or suggestions for a wood structure, which will enable him to satisfy his client's demands for the ornate, whereas he has found himself unable to do this in the employment of brick. *The trouble lies not so much in the cost of the wall proper as in the cost of trimmings to make them attractive.*

It is only now and then that a man is found who is willing to accept the plainer brick structure in place of the ornate and more attractive wood, and even less seldom, perhaps, that "my lady" can be brought to entertain the same views.

The fact is, an artistic standard has been set up in every wide-awake neighborhood or community, and that standard must be maintained; to sacrifice it for the more solid and enduring qualities which brick are supposed to possess, requires an indifference to the prevailing opinion which few only possess, and these are the "present conditions" to which we referred.

E. G. Durant, Author of "The Development of Hollow Block Manufacture."

This brings us face to face with the question, *what can be done to* popularize brick? All are ready to concede that they have superior qualities, but so have many young ladies, who "good but homely" are passed by in the quest for a pretty face. "A great mistake," you say, but how many make it?

We have a belief born of much study of this matter of ornamenting brick dwellings and brick structures generally that the day is not far off in which brick may be able to score its deserved triumphs (as against wood, mind you), but to do this, like Adam of old, it must have a companion that shall be "bone of its bone." Clay must come to the relief of clay before any further notable advance is made.

While we have been thinking upon this matter, we have had no little help from an object lesson in the line of our thoughts. We have been watching, as several times a day we have been called upon to pass, the beginnings and the steps towards completion of a fine residence in course of construction on a street lined with fine residences. Just to the north of it stands a beautiful home with walls of yellow pressed brick, freely ornamented with fine carved stone work, a building to be noted for its beauty among a thousand. Erected by one who had only to reach a conclusion as to what was best and most to be desired to say, "I will have it."

But this later residence is being built by a young business man who has not earned a competence. What will it be, placed, as it is, amidst its fine surroundings, millions of capital being represented in the homes on at least two sides of it. We knew nothing of the plans, and hence watched the progress with curious interest. "There will be a struggle for a fine appearance, of course," we thought. No doubt on that score. The foundations laid said it will be a large structure, and as they appeared above ground a fine cut stone facing kept them company, in due time capped with a handsome and massive stone water table. To my surprise, a wood frame next appeared, but placed back far enough upon the wall to indicate that the superstructure was to have a brick veneer face. When this veneering—which was of fine, buff pressed brick—reached the height of the first story it ceased, and we noticed that short sections of 2x4 scantling were being spiked to the boarded framework above the brick, these scantlings, about 18 inches in length, were set vertically about 16 inches to center, and between them common brick were laid. Over this and nailed to the short studs an elaborately molded and ornamented belt course next appeared. Watching the placing of this belt course we noted the time employed upon it, and, being no less familiar with the details and cost of woodwork than of clay, we were able to intelligently calculate its cost and compare it with the same character of ornamentation as brought out in hollow plastic fire clay blocks, and, somewhat to our own surprise, we confess, we came to the conclusion that in this case, which we think may be taken as fairly representative, clay could be made to take the place of wood without the cost being increased. Of course, with the advent of this wood belt course our expectation of seeing the walls of the building completed as a brick veneer ceased, and we were not surprised to see the next story faced with a narrow siding and crowned with a frieze to correspond with the belt course.

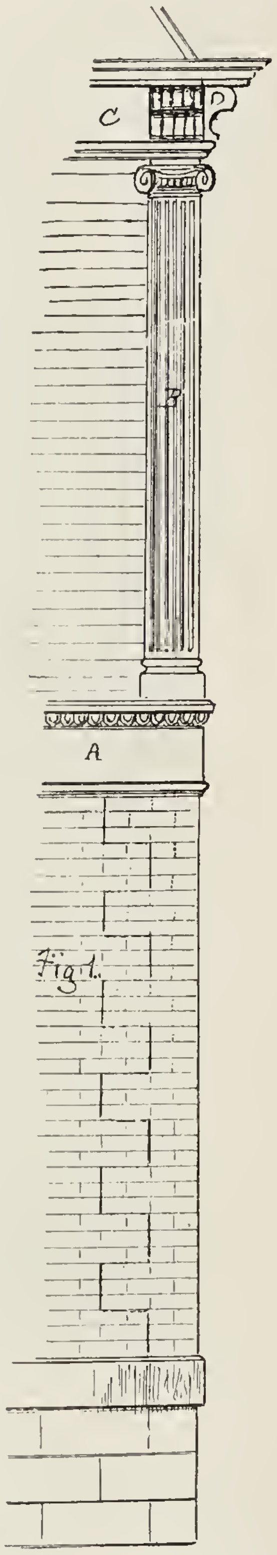


Fig. 1.

The corners of the building above the belt were ornamented with pilasters, crowned with carved capitols, the frieze being decorated here and there with staff or plaster ornaments.

In Fig. 1. we give a sketch of a front corner of the building, in order to a further and more intelligent discussion of it, in connection with the question, "How might the material which entered into the entire wall face have been supplied by the clayworker and the architects design have been carried out?" and to link with this question another, viz.: "Could this have been done without adding materially to the cost?" We believe it could have been, provided—and here comes the rub—the clayworker was alive to his opportunities.

It will not be profitable in a paper of this character to enter into the details of cost in either case, and we can only hope to present the matter in such manner and shape before the reader as to convince him that we are close to the truth in the conclusions we present.

As will be seen from the sketch, the only attempt at ornamentation in the laying of the brick may be found in the ashlared quoins at the corners, and an arched doorway not shown; the window caps being either flat or cambered brick arches; the jambs all being plain; the wood trimmings being solely depended upon for ornamentation.

It will be seen that the belt course consisted of the plain section "A," about 12 inches wide. Molded at top and bottom, the top molding included a carved egg and dart member.

On this projecting top molding rested the pilaster "B," the body of the column projecting perhaps 2 inches from the face of the siding and apparently supporting the entablature "C." The heavy bracket "D" placed directly over the pilaster furnished an appropriate cornice support in harmony with the general design.

Here is a house costing $10,000 to $12,000. Brick were used as a facing for the first story only to give it some character for stability and permanence apparently, and then everything else was abandoned for show and ornamentation. The design is good and the general effect is pleasing, noticeably so; but the pity is that every attempt at ornamentation served to render the walls more vulnerable to the attacks which the elements will make upon them. In the nature of things the broad, plain members of the belt course will check, and the joints will open, and the rain will beat in behind the moldings and begin the sure work of decay. This will be specially true of the cap and base of the pilaster. Paint and putty must be frequently resorted to, to repair and hold in check, and at no little cost to the owner. But we need not dwell upon this, and we have only referred to it at length to emphasize the fact that clay wares may be made, as we believe, to do duty in carrying out what may be called a more than ordinary ornate and difficult design—from the brickmaker's standpoint—and that without any material addition to costs. This can only come through hollow machine work, slightly supplemented by hand work, which the machine made ware manufacturer must be prepared to furnish in order to complete the architect's designs. Two questions will at once be raised by objectors and doubters, the first of which will be, "Can you get the architects to accept your stock designs?" coupled with the assurance perhaps that you will be called upon to get up a new design for every fresh job. To which we may answer: "That depends very much upon how wisely your designs are chosen."

That the manufacturer must have more than one stock design we will admit, but let us reason from the design before us. It is not necessary that a house be built to duplicate the one shown, in order to secure the use of the particular pilaster shown; the same pilaster is equally appropriate for ornamenting doorways, and is as applicable to a first story as a second. It is a classic style, and has survived the changes of twenty or more centuries, and is as likely to survive the next. The same is true of the egg and dart and other moldings. Let the manufacturer have a few good stock designs and see that the architect is made acquainted with the fact, and he will, if his work is honest and good, be surprised to find into how many new combinations and designs of the architect they can be made to enter. No doubt he will be called upon for others from time to time, but these he will be as ready to furnish as the architect is to furnish a fresh design for his next client.

A second question will be—or it may come simply as the expression of doubt as to the ability of the manufacturer to furnish this class of clay wares at such a price as to admit of their free use.

Perhaps we can best meet this questioning or doubt, whichever it may be, by an illustration or two drawn from the ornamental features of the building we have had under consideration.

Take first the capital of the column. We may feel sure that the cost of material and labor entering into it when made of wood and carved by hand, as it must be, will cost as much as the clay and the molding of the same—after the molds have once been furnished—the class of labor need not be of any higher, if as high grade, and the time required for the molding will be less than that required for the carving to produce equally as artistic work. The burning may be fairly offset by the painting, puttying, etc., requiring several successive operations, while the final placing in position may be as quickly performed in the one case as the other.

When we come to consider the body of the pilaster, a cross section of which, in clay ware, may be seen in Fig. 2, it may be stated that such blocks having 1-inch walls will weigh about 42 pounds to the running foot, and that when dies are once in position a machine will easily produce an average of 400 feet per hour. This is about 200 feet less than is produced of ornamented blocks 8¼ inches square.

We are acquainted with more than one factory manufacturing ornamented hollow blocks and mining their own clays and coals that are operated, including all office and selling expenses, at an outlay of less than $12 per hour running time, that are abundantly able to do the amount of work named. As on this class of wares we may not expect to set our dies for a day's continuous run—we will double the time named in order to cover the cost of setting dies, etc., and doing so, we find that 400 feet of such blocks have cost us $24.00, or 6 cents per running foot. Let the doubter add what he may please to this estimate in order to feel safe, and it will still be apparent that there will be abundant margins for profit to the manufacturer without adding a necessary burden to ordinary brick construction, as against wood trimmings of equal character of design, by calling them into service. Referring to Fig. 2, it will be noticed that the column laps upon the brickwork a half inch or more, and, also, that beyond this point of lap it takes the place of brick in forming the corner, and can be tied to to the woodwork in the same manner as the brick. It will not be questionable but that it can be placed in position as quickly as the brick it will supersede.

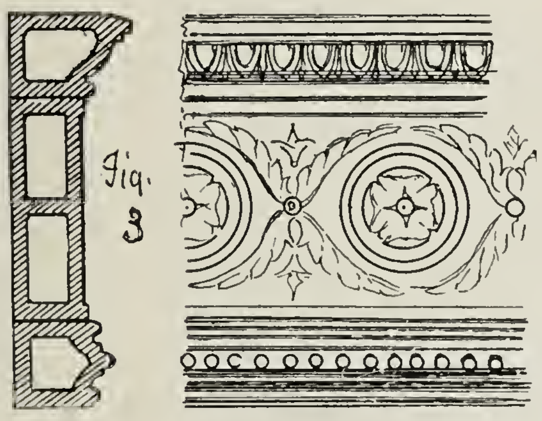


Fig. 3

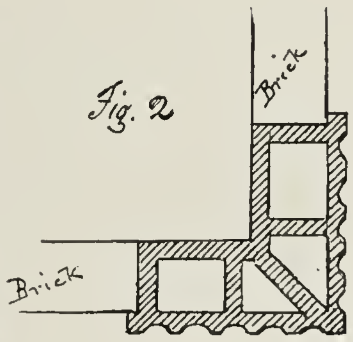


Fig. 2

These column sections may be 1½ or 2 feet in length, and longer, if required.

In Fig. 3 we show a cross section and face view of the belt course divided into three courses.

The upper molded section being 4¾ inches high as the equivalent of two courses of brick. The mid section as 12¼ inches, representing five courses of brick, and the lower molded section, 4¾ inches, or 2½inches as preferred.

Such heights of face are deemed desirable, as permitting the use of each independently of the other, and as insuring their being used in harmony with brick courses in whatever place required.

The 12¼-inch member may give place to a 9¾-inch, representing one course less of brick.

In comparing this clay work with the wood belt course which it is designated to supersede it will not need that we make another estimate of the cost of clay work, a basis having already been furnished. We wil say, however, of the wood belt course, shown in Fig. 1, we satisfied ourselves that, including metal flashing, placing in position, painting, etc., it cost in excess of 40 cents per running foot, exclusive of the backing of brickwork and scantling, upon which it rested, which backing cost certainly much more than the setting of the clay belting could be estimated at. Were we contracting for this class of claywork we would be glad to furnish it at the estimated cost of the wood.

And referring to Fig. 3, it will be seen that we could add an element of beauty wanting in the wood, viz.: a graceful design to adorn the mid section.

Still another question will come to the mind of the honest doubter: "How are you going to meet the demands for color, shade, etc., which are likely to be excessive?" To this we make answer; Two or three standard shades of the staple designs may be carried in stock, such as will be acceptable for use both with red and buff brick. We have in a former paper shown how these shades may be obtained, and by a simple process be made quite uniform. Such a course would meet a large portion of the demand, no doubt. Some experience would be required, and good taste and judgment exercised. What demand could not be met in this way could be met by special production at a modest addition to cost above stock prices. Works outfitted with a second block forming machine to which any special die could be adjusted without interrupting the regular work going on at the time, taking the time of but a single workman until the machine was ready for operating, and color conditions and designs already arranged, would enable a concern to meet any special requirements at short notice and at little additional cost.

IN CONCLUSION.

The illustration we have made use of was not selected by us, indeed was not such an one as we would have chosen. We had in mind the presentation of the case by illustrating with more common grades of work, but, on reflection, we have not been sorry that this particular example came to our notice in such way that we could make a comparative study of it, and so be made the basis for this presentation.

It certainly shows how and why brick are crowded out, and, if in a case like the one presented, then much more frequently in the case of those who would build houses costing from $1,500 to $5,000. And if it seems fair to expect that we may meet the requirements of the more exacting, we may feel sure that the needs of the general building public may be met.

It needs not that we make any comparisons with handmade terra cotta, too much cannot be said in its praise. It has a field of its own which we need not invade. There is "plenty of room" in this case *below* the level of handmade work, but *above* the brickmaker's capacity to produce. Handmade work occupies a comparatively limited field; its products are for the few. Our aim should be to produce its best features as nearly as possible for the multitude. If we cannot do all that they do, we can furnish at less than one-fourth the cost that which shall enable the makers of good machine brick to largely extend their sales by furnishing for them a suitable trimming—wood belittles brick.

Reference to former papers will indicate how porches and verandas may be produced of the same class of wares to further supplement the good work of substituting clay for wood. Our forests are fast disappearing, our clay banks are inexhaustible.

A man may be warmly clad with coat, vest and pants of excellent material and yet for want of collar, necktie and boiled shirt be unpresentable. This is Brick's case. There is money for the enterprising clayworker who has a good clay and will use it to complete Brick's outfit, for he represents a large family, the most of them having similar wants.

The Largest Chimney in the World.

The 353-foot chimney with a 22-foot core, which has just been completed at the Ninety-sixth street station of the Metropolitan Street Railway Company, New York, is said to be the largest in the world, and the tallest on the continent. So far as height alone is concerned it is eclipsed by the 460-foot stack at Hutte, Saxony, by several in England and within a few inches of equaled by the 352-foot 7-inch chimney of the Omaha & Grant Smelting Company at Denver, Col.

The 70,000 horse-power station which this immense chimney is designed to serve is being erected on the East river, between Ninety-fifth and Ninety-sixth streets, upon a site which was once under water, but which has been filled to a depth of about 25 feet with earth and ashes. Beneath this filling borings revealed successive layers of blue clay, beach sand, fine red sand and clay, rock being struck at 125 feet below the datum line.

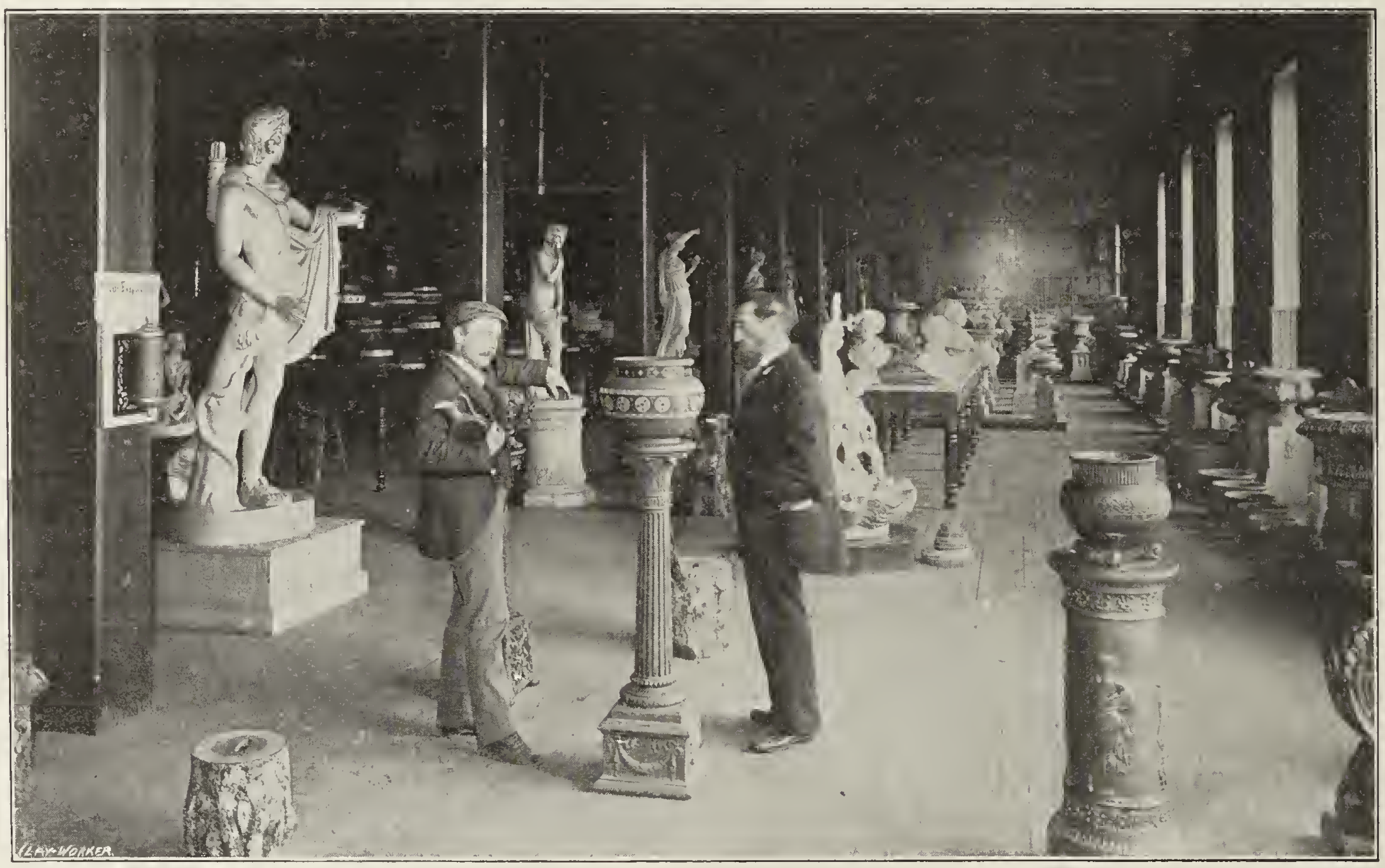
To provide a suitable foundation for the great shaft, the earth and ash filling was removed from a space about 85 feet square to a depth of 20 feet below the level of the station floor. Into the floor of the basin thus formed piles were driven by drivers hung upon booms, as shown in our engraving, over the entire area, spaced two feet three inches and two feet six inches apart. The usual depth to which the piles were driven was 40 feet, at which depth it was found that a 2,500-pound hammer falling 20 feet drove them about one inch on an average. Toward the last the driving became so difficult that the last 20 or 30 piles could not be driven over 15 feet. These piles, of which 1,300 were driven, were sawed off about one foot above the surface of the ground at the bottom of the pit, which was then filled with a mixture of one part Giant Portland cement, three parts sand and five parts broken stone, making, when set, a gigantic block of concrete 85 feet square and 20 feet in thickness. Upon this block was built the chimney 353 feet in height and weighing 8,540 tons.—Power.

Written for the CLAY-WORKER.

TERRA COTTA ORNAMENTS AND STATUARY.

IN DEALING with the uses of terra cotta as an outside or exterior form of embellishment we must not altogether neglect the argument it offers for interior decorative purposes. In our present day form of building every opportunity is offered to the clayworkers of our wealth-ladened States to advance artistic desires and further the education of our fast rising generations to procure and live in, as did the Greeks of old, an atmosphere charged with the efforts of men who devote their lives to the production and reproduction of the beautiful.

A few years ago and the open fireplace was held in place by the dignified but cold slabs and mantels of marble. Marble is beautifully cold, but it has always appealed to me as something belonging more to the dear, dear dead, than to the living. Plans and specifications to-day usually call for the introduction of brick and terra cotta in the adornment of the fireplace in the dining, sitting and billiard room, not forgetting the den. It is at once warm and inviting, neutralizing the fierce red heat of the fire, and centering harmoniously into the warmer tints essential to the tastefully planned and decorated room. Moreover, it may be said, as a resisting agent, to stand far better the heat waves and gaseous actions of the coal or gas fire than does marble. Again, it is less costly and bears ornamentation in an acceptably economic condition far better than the material now almost obsolete.



SHOW ROOM, WILLIAM GALLOWAY.

We are slowly but surely emerging from the cold grave age of the Puritans to take on a garb of color and ornamentation that pre-historically has always given evidence of wealth, education and aesthetic refinement. The Greeks reveled in it and the Latin races of Europe to-day find the gloom of their labors and poverty lightened by the presence of the sculptural and fine art themes handed down by a former generation. Here in our illustration we have a facsimile of the world known Appollo. What is it? It is a terra cotta reproduction of what only one nation in the world can possess. Therefore, all other nations must be content to adorn their institutions with the best possible reproductions. The modest but artistic citizen is, therefore, enabled to adorn his home, delight his mind and educate his children in classic sculpture, obtaining specimens for sums ranging from twenty dollars to the amount unlimited.

The modus operandi among our terra cotta manufacturers is to obtain from London, Paris and Florence plaster casts of celebrated pieces of statuary. These are turned over to skilled workmen, modelers who deal with the sections according to their specialty; some are good at making heads, hands or feet and, sometimes, mistakes—pardon the facetiousness of that remark.

The clays obtained are made up in a combination or texture suitable to the prescribed requirements of the piece and fired, the burning being less than that usually applied to commercial terra cotta. The result being that our institutions of art are awakening to the broad possibilities of clay, not as a rude factor, governing only the domestic side of life, but as a plastic quality, that, in the hands of experienced workmen and artists. may be called upon to assist in the sculptural decorations of our cities, parks, institutions and homes.

The Warwick vase here reproduced is but a replica of the celebrated vase seen by tourists at the country seat of the "'Great King Makers and King Breakers," as they were termed in Warwickshire, England. This is shown to-day by the caretaker, who, after describing the history of the famous vase and the quantity of punch it will hold, winds up with an "Hi hexpect a fee." The figure of Flora is but another charming figure handed down, presumably, from the Rhodian School or Praxiteles, 320 B. C., to give this age a problem in art wherein we may develop as did the Greeks in that period in making and creating the nobler specimens of human figurement, not to ourselves alone, but for those of ours that are to come. Apart from all this, it proves the utility of the material, and, better than all, it means the provision of labor in a broad and unlimited field.

Ho, clayworkers, ye that make plain, hardened stretchers, have ye stopped work and thought queitly over a pipe of the immense possibilities of clay? Have ye thought of how the exterior of your house may be all clay, brick ornamental details right up to the finials and the inside, floors, mantels, ornaments, and, instead of having a miserable charcoal drawing, don't you think a nicely finished and well-modeled bust of your lost one would appeal more strongly to you? Sure.

The manufacture of this material, so far as Philadelphia is concerned, is confined exclusively to the plant of William Galloway, at 31st and Walnut Streets, a house that dates its establishmment in 1810, and which for many years was identified with the large show rooms at 18th and Market streets under the name of Galloway and Graff. During the Centennial of 1876 this firm made an elaborate display of artistic and sculptural reproductions and pottery, and sought by many means to induce the American visitors to create a commercial interest in American work and skill in terra cotta.

Modelling Room, William Galloway.

Along in 1889 the plant was removed to its present location. This, however, was totally destroyed in 1894, leaving nothing but the kilns. Since its restoration many improvements have been made. The exhibition room covers 90,000 feet floor space, while in the rear fine quarters are devoted to the modeling, drying and glazing department. In the grounds proper are four muffled kilns, three down drafts and one square, averaging sixteen feet. In the off season about 130 men are employed, the busy season calling for over 200 men, who are constantly employed on what is known as architectural garden embellishments, statuary, fountains, vases, images and other ware.

W. P. LOCKINGTON.

A Case of Misplaced Sympathy.

Among the visitors to a fine art exhibition were two old ladies from the country. They were engaged in examining with great interest the statue of a young Greek, underneath which were inscribed the words, "Executed in Terra Cotta." "Where is Terra Cotta?" asked the elder of the two, turning to her companion. "I haven't the least idea," replied the other. "I never heard of the place before." "Ah, well," observed the first speaker, "it doesn't much signify. The poor man who was executed there is not the less to be pitied, wherever it may be."

THE MANUFACTURE OF SLAG BRICK.

IN THE THIRD convention of the German Concrete Association Mr. Meyer made this the subject of an interesting esting paper.

The manuafacture of slag brick is not a new industry. As early as 1859 brick were made of blast furnace slag and lime mortar at Osnabrueck, by the hand mold process. In the seventies an Osnabrueck firm built the first successful press for pressing the slag and lime mixture, so-called piston-presses, which are in use yet to-day, and thus developed the new process into an independent branch of industry. The brick made, as a rule, were good, and were used quite extensively. But not always was it possible to produce faultless brick, and especially annoying was the introduction of unslaked lime particles into the brick, due to carelessness in slaking the lime. This caused this method to be abandoned and to be replaced in 1890 by one which uses in place of lime slag cement and ground, dry, blast-furnace slag with lime hydrate.

The new method was a pronounced success, as is shown by the fact that while in 1893 5,000,000 brick were made at the George-Marien furnace, the same concern in 1898 manufactured 15,000,000. The slag brick actually answers all requirements of a good building brick. It is porous, somewhat more so than the clay brick, has a high crushing strength, over 1,375 pounds per square inch for brick only a few months old. The brick becomes harder and harder with age, since the chemical combination between the slag and lime becomes more and more intimate.

The manufacture of the slag brick proceeds as follows:

The slag flowing from the furnace is directed into running water for the purpose of granulation, and is then taken to the brick works on cars. The wet granulated slag is intimately mixed with slag cement in the proportion of eight to one in mixing machines, and is then pressed into brick. The presses are of the one mold type, and turn out 10,000 brick per day. The brick can be hacked immediately, and the rest is left to the air. After from two to four months the brick are ready to be laid. A dry brick weighs 7.7 pounds, its dimensions being of the large German standard. The color is grayish white.

Owing to the rough, flat surface the brick can be laid with thin mortar and thin joints. If the brick are not very old they can be cut very nicely by the bricklayer. By using ochre different colors can be produced. Since mortar and brick have similar properties an old wall cannot be torn down without breaking every brick, as they unite so firmly. The resistance to heat is quite great, and stacks, as well as hot gas flues, have been built with such brick. The absorption of water is about equal to that of clay brick when the slag brick is fresh. Hardened brick absorb water much slower. Churches, schools, hospitals, dwellings, as well as all the buildings of the George-Marien furnace, are built with these brick. They have likewise been used in the construction of water basins, canals, foundations of bridges and foundations for machinery, and have proven satisfactory.

It is the intention of the concern to manufacture face and ornamental brick from granulated slag in the near future. It has also been found that cement mixed with fine grained slag in the proportion of one to eleven produces an excellent concrete.

(Slag cement is being manufactured in the United States at present by the Illinois Steel Co., the Pennsylvania Steel Co., the Briar Hill Iron and Coal Co., and the Clinton Iron and Steel Co., Pittsburg.)

Written for the CLAY-WORKER.

HOW IS YOUR CHAIN?

A MODERN BRICK PLANT may be likened unto a chain. As the strength of a chain equals that of its weakest link, so the capacity of a brick plant is regulated by the capacity of the slowest machine or department of the plant. Say, for instance, a new company starts in the dry press brick business. They have sufficient power to drive one nine-foot dry pan, have ample screening capacity for all the clay the pan will grind, have a four-mold press, running at the rate of 24,000, from which is expected 20,000 per day of ten hours; have ample drying apparatus and kilns for 20,000 brick per day. The outlook is bright for success, but a contingency arises. It is found, after a period of operation of the plant, that when the clay is ground in proper condition to make the most dense and perfect brick the grinding capacity is reduced to, say, 12,000 to 14,000 per day. The company realizes that instead of having a 20,000 plant they have an unlucky 13,000 on their hands, and begin to figure on ways and means of correcting the cause. The superintendent calls their attention to the fact that he is unable to grind sufficient clay to make 20,000 brick and make them right, and that if he were to grind clay for 20,000 brick the clay would be so dry that the brick would be inferior, and, having instructions from the company not to sacrifice quality for quantity, he is necessarily making 13,000 good brick rather than 20,000 inferior ones.

In this case the capacity of the plant is ruled by that of the dry pan, and we will now consider the remedy, if remedy there may be. The board of directors hears the statement of the superintendent and talks the matter over, and decides that his representations of the case are correct and that more grinding machinery should be installed. But another consideration arises. It will be necessary, in order to run more grinding machinery, to increase the power, because the engine is just strong enough for the original outfit, and the boilers have all they can do to run the engine and furnish steam for the dryers. So it is not a question of, say, the cost of the new grinding and screening outfit, but also of the power and additional buildings.

A critical moment in the company's history is just here, and the success or failure of the plant depends on the action taken at this time. What will the board of directors do? Let us consider the points in the case.

The company has barely enough working capital to run on, consequently that cannot be touched for the purpose of betterments. It is inconvenient to increase the capital stock of the company to raise the funds, and not desirable if the plant makes money, as is expected. The only convenient way to act in the matter is to have a meeting of the stockholders and authorize a loan on paper, indorsed individually by the directors, who are secured by mortgage or deed of trust. The old engine is disposed of by advertisement through the clay journals, new boilers are added to the plant, the grinding capacity is doubled, and, as far as the grinding machinery is concerned, the capacity is 26,000 instead of 13,000, from which capacity we can well count on the 20,000 average, and the success of the plant is assured.

Suppose the board of directors should have taken the opposite course, and decided: Whereas, It is shown to our satisfaction that we should have additional grinding machinery; and whereas, the present condition of our finances is such that we cannot spare the required amount from our working capital; and whereas, we hope the coming season will be so prosperous that we can make the said improvements next winter; therefore, be it resolved, that we concur in the recommendations of the superintendent, and authorize such changes as he suggests—at a future time.

By such action the board of directors is laying the ax at the root of the tree from which they hope to gather fruit. At the end of the season they realize they have been paying wages for 20,000 and only get 13,000. The men were willing to make the 20,000, and the howl for "more clay" was a common one in the yard, but the clay came not, and the directors were obliged to indorse the company's paper to make good a deficit, instead of voting a stock dividend for improvements they had hoped to make.

The life of a company under such circumstances depends largely on the personal responsibility of the directory. If they are exceedingly strong they may drag the company along for years, but if of only ordinary rating the life of the company will be short, and, we may say, the shorter the better, under the circumstances, because "soonest over, soonest mended," and a new company can benefit by the experience of the old, and start right and keep right.

The moral seen in consideration of the above is plain, and shows the importance of repairing a weak place the moment it is observed. The brickmaker knows what the capacity of his plant should be. If the capacity is short, study the cause. Do you get your clay promptly to the grinding machinery in sufficient quantity? Do your feeders get the clay into pans or pulverizers as regularly and as fast as they should? Does the attention paid by the men to their old tobacco pipes and scrap pouches interfere with your capacity? Are your pans kept in right condition all the time so as to work to best advantage? Do your elevators run fast enough to carry all the clay without clogging? Do you watch the belt fastenings, that they do not give out on you during working hours? Do you keep your belts tight, that they do not fly off the pulleys when you have a dozen or more men under pay? Does your pressman shut the press down every time a chum or visitor comes around and wants to chat with him? Do you see that your "no admittance" signs are properly regarded? Do you see that your engineer or other employe who causes an unnecessary delay or stoppage of the machinery does not do it the second time? Do you see that no weak, old man or incapable person is holding a job through your sympathy, and that you are not running a charitable institution? Do you keep all nuts and bolts tight? Do you see a break before it occurs and prevent it? Do you find a hot place before it heats, or a worn place before it wears?

Always give your chief attention to the weakest link in your chain. Make it able for its share of the work along with the rest, so that by making and keeping all links alike you may expect and get full capacity out of your plant.

Your business will grow according to your ability to do business. Your customers will stick to you if they can depend on you for their supply. They will desert you if you disappoint them from time to time.

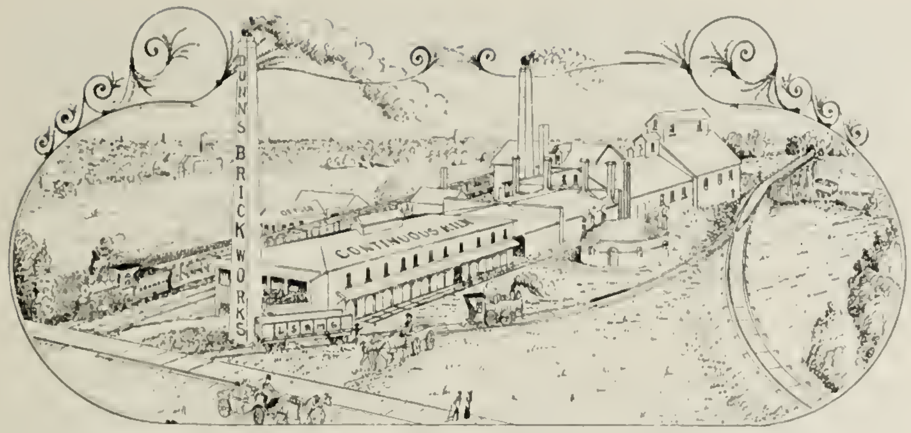
Keep your plant right, your stock right, your collections right, and you will be able to keep your family right.

When you know a change should be made in your plant, make it at once, regardless of first cost. If it means the consignment of a costly machine to the scrap pile or to the second-hand machinery advertisements, let it go, as it has its hands in the company's pocket, taking its good dollars, as long as it holds a place that should be occupied by a better machine. The same can be said of kilns, etc. If the addition of improve-furnaces will cheapen the cost of your fuel and improve the quality of your brick, why not take the advantage of this profit?

Of course, your best judgment must be used in considering the various schemes and contrivances that are offered brickmakers, but a practical man's good common sense will generally steer him clear of fakes, and he can generally tell to a certainty, after a short, critical examination, whether a machine, or a furnace, or a convenient article can be profitably used in his plant.

See that the links in your chain are kept uniformly strong, and you will seldom, if ever, go very far wrong.

T. W. CARMICHAEL.



BRICKYARD SKETCHES.

THE BRICKYARDS OF ERIE, PA.

IF YOU ARE a brickmaker and thoroughly in sympathy with your profession, it might be of some interest to you to make a personal visit to all the brickyards in the Gem City of the Lakes. There are seven of them, and they represent all the processes of brickmaking—soft-mud, stiff-mud and dry-press. The first requisite for making a good brick is to have a good material from which to make it. There is no first-class brick clay to be found in or near Erie, although there is quite an abundance of excellent shale. I will speak more particularly of the material used as we visit each factory.

THE LAKE SHORE BRICKWORKS,

H. D. Schoonmaker, proprietor, successor to the Selden Brick Company, is located in the city, at the foot of East avenue and on the bank of Lake Erie. The view of Presque Isle bay and the lake is very fine from this point. The dry-press process is employed here, and both clay and shale are used. They have two clays—yellow and blue—neither of which is very strong, and both quite sandy, but, when well mixed with shale, which is found beneath the clay, it makes a brick of a very superior quality. The yellow burns a beautiful red for fine face brick, and the blue burns a dark reddish-blue color, but very pleasing.

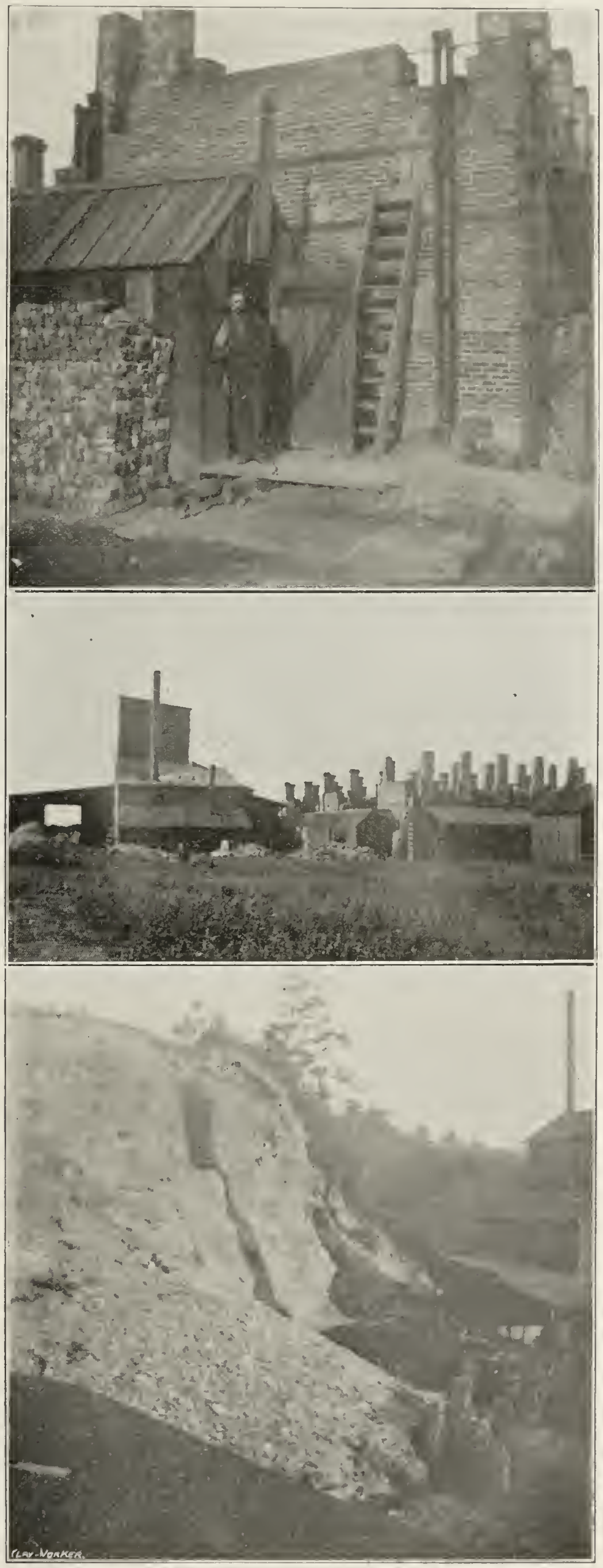
The material is brought into the factory on wagons, and ground on a Stedman pulverizer and screened on a Richardson shaking screen. It is then presssed into brick on the Simpson dry-press and burned in Eudaly kilns, of which there are three. This plant produces about two million brick annually. This yard has been in operation nearly thirty years, and formerly made soft-mud brick, but was changed to dry-press some six years ago. Mr. I. M. Justice, ex-secretary of the Ohio Clayworkers' Association, had charge of the works during 1897 and 1898, but gave up the superintendency last winter to go on the road for the Horton Manufacturing Company, and, I am pleased to know, is quite successful as a machine salesman.

GLENWOOD SHALE BRICKWORKS.

Mr. T. J. Paradine & Son are owners and proprietors of this plant, which is situated about one mile south of the city limits, and is adjacent to Glenwood Park, a beautiful summer resort. This plant manufactures only fine dry-pressed, red face brick, which, in color and quality, are second to none found on the market anywhere. They are made from pure shale, of which there is a most remarkable bank. There are about sixteen acres of it, and where the bank is being worked it presents a perpendicular face of sixty feet. This is so near the factory that only wheelbarrows are used to bring it to the crusher. It contains no stone or waste matter of any kind. A Frost drypan is used for grinding. The screen is of the stationary, inclined style, with a light bumping attachment at the upper end. The brick machine is a four-mold United States dry-press, with which Mr. Paradine seems well pleased. There are two large, square, down-draft kilns, both of which connect with a large brick stack. There is a neat office and stock shed for storing the best grades of brick. The market of this yard has been mostly local, but in the future they hope to secure considerable outside trade. The brick will sell on their merits.

DUNN'S BRICKWORKS,

Mr. H. C. Dunn, owner and manager, is located on East Twelfth street, near the city limits. This plant is the largest and best equipped of any in the city. The stiff-mud process is the modus operandi in this factory, and the brick are made from



1. Lake Shore Brick Co's Kiln and Burner. 2. A Section of the same Company's Works. 3. The Glenwood Shale Brick Co's Clay Bank.

pure shale of a very excellent quality. This shale bed covers about fifteen acres, and at present is being worked about fifteen feet deep. This plant was erected by Mr. Dunn in 1896, under the supervision of Mr. I. M. Justice. The material is brought into the factory up an inclined track, on dump cars, with cable and winding drum. It is then put through a Stevenson dry pan, and screened on an incline stationary screen, the upper end of which has a slight vertical movement and a light bump to assist in keeping it clean. From the screen the material is delivered into a Richardson hopper and feeder. It now comes to the brick machine—a combine "Mammoth" from E. M. Freese & Co. The cutting table, Freese patent, is semi-automatic, and the brick pass from it to a separating belt, from which they are loaded on double-decked cars and passed into the dryer. This is a steam dryer 110 feet long, and contains fourteen tracks. The heat is supplied by one of the E. M. Link Machinery Co.'s Erie, Pa., heaters and fans, which uses both live and exhaust steam. The heat enters beneath the cars at the discharge end and passes through to the receiving end, carrying the moisture off through large stacks. This dryer is not patented, but it is a success. The brick are burned in a sixteen-chamber Wilford continuous kiln. The operation of this kiln is a complete success, producing the most uniform burns of all hard brick that I have ever seen. Much has been said both for and against the continuous kiln in this country, and, to my knowledge, a number of them have been abandoned and torn down as utterly worthless, and the cost charged to profit and loss. But that proves nothing, as many other kilns have met the same fate. The continuous kiln, when properly constructed and skilfully operated, is the best and most economical system of burning common building brick known today. Mr. Dunn also uses one round down-draft kiln, known as the Smith kiln. The L. S. & M. S. Railway tracks run into the yard, which afford the very best facility for receiving coal and for the shipment of brick. Mr. Dunn, who is an old-time and popular member of the N. B. M. A., has always lived in Erie, and has been twenty years in the brick business, and during that time he has built four yards. The clay being exhausted each time caused a removal. His output this year will be about five millions.

1. Dudenhoeffer's Works and Foreman Decker. 2. Erie City Brick Works. 3. Dudenhoeffers Three of a Kind.

DUDENHOEFFER BRICKWORKS.

This is the largest soft-mud yard here, and is located about two miles beyond the city limits, south of the city. Frank Dudenhoeffer is well known in the city, and enjoys his full share of the local trade. He has a fine bed of soft yellow clay, as good as can be found anywhere in this vicinity. The clay is generally worked out and weathered during the winter. It is then hauled by dumpcarts and loaded into a dumpcar about six hundred feet from the factory. It is then drawn up by a cable to the crusher. It first goes into a crusher with corrugated rolls, from which it is delivered into the brick machine. The machine is a "Hercules," built by the Horton Manufacturing Company, Painesville, O., and is new, only being used the past season. The drying is the pallet system, under large sheds, and also on the open yard. There are three large, up-draft kilns of the common style, with permanent side walls with furnaces. This yard produces a first-class sand-mold brick of a good red color.

M'CARTY'S BRICKWORKS.

James McCarty's brickworks are located in the city, at the foot of Parade street. Mr. McCarty has been many years in the brick business, and manufactures by the soft-mud process, using a mixture of blue and yellow clay. This clay has the same fault that all clays found here have—weak and sandy. However, when the two are thoroughly mixed, it makes a good building brick. In this factory the clay is brought in down an incline track on dumpcars by gravity, a brake being used to regulate the speed of the car. The clay goes direct to the brick machine without any preparation. This machine is one which was designed by Mr. P. J. Paradine, a local genius, some years ago. The brick are mostly dried on pallets in the open yard, the cheapest system while there is plenty of wind and sunshine. There is a small direct heat dryer which is used in the late fall and early spring, when business demands it. There are three large up-draft kilns, with permanent side walls, with furnaces. The burns are fairly good, the only difficulty being, as in all up-draft kilns, to get all hard brick, which the trade now demands.

GENCK BROTHERS' YARD.

This yard is located just beyond the city limits, south of the city. The material used here is a very good soft yellow clay, and makes a first-class common building brick. The yard is operated by the soft mud system, the clay being brought in on dump carts. It is run through a crusher, and is screened before entering the brick machine. This machine is the same as used by Mr. McCarty. The drying is all done on pallets in an open yard. There are two good up-draft kilns, having side walls and furnaces. Genck Bros. are good brickmakers, and their brick are equal to any soft mud brick put on this market, though the output for the past year was small.

ERIE CITY BRICKWORKS.

Mr. H. Hogan is proprietor of this yard, which is located in South Erie, near Twenty-eighth street, between Holland and German streets. The material used is a yellowish soft clay, but badly mixed with gravel stones, and is very difficult to work into a smooth brick. It is brought into the factory by dump carts, and is put through a small pug mill before entering the brick machine, which is a "Monarch," from the Wellington Machine Company, Wellington, O., a very excellent machine of its class. The brick are loaded on cars by the pallet system and passed into a steam dryer of Mr. Hogan's own design. The dryer is heated by a system of steam pipes running beneath the cars, and the moisture is carried off through numerous small stacks on top of the dryer. Exhaust steam is used to supply the heat. We now come to the kiln, which is a Radford continuous. This kiln consists of one continuous chamber, round, like a race course. It has been in operation for two years, and produces very nice, uniform burns, at very low cost per thousand.

The amount of capital invested in the brick business in Erie is, roughly estimated, $150,000, and the entire output of brick for the year will scarcely exceed 11,000,000. The greater part of these were sold at the close of the season, and the stock carried over for spring trade was light. The year 1898, generally speaking, was an off one for the Erie brickmakers. Prices have already declined for the past three years. On large contracts for all good hard brick $5 has been the ruling price, and the softer grades bring considerably less, while sidewalk paving brick only bring $6.

An agreement of all the manufacturers which would secure to them better prices would be a good thing, and it is not improbable that such an agreement may be in vogue by the time this matter is in print.

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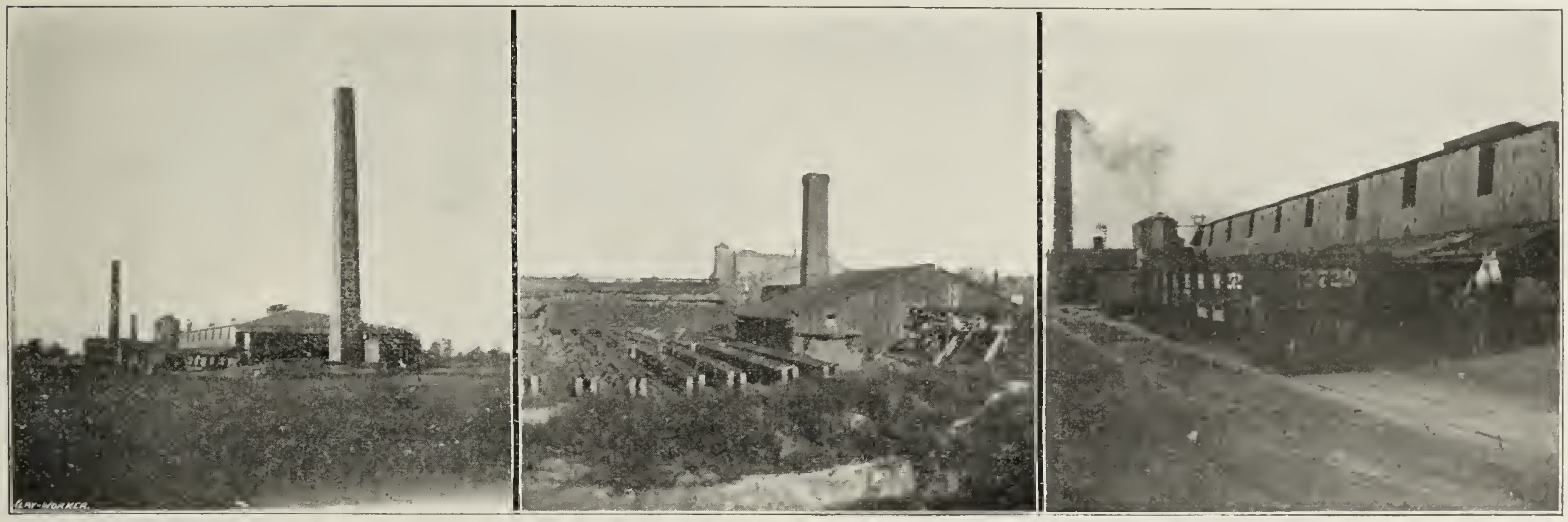


1. Dunn's Factory. 2. McCarty's Yard. 3. Rear of Dunn's Factory.

Written for THE CLAY-WORKER.

MODERN AMERICAN FRONT BRICK. No. 15.

THE CHEMICAL TESTING OF CLAYS.

A COMPILATION of the opinions of clayworkers in regard to the value of clay analysis would make an interesting little volume. It would be very small in size and its chapters very brief. The average opinion prevalent among the craft in regard to this point is not hard to guess. It may safely be assumed that it expresses a more or less strong doubt as to the value of an analysis. Some would deny flatly that any benefits are to be derived from it; others would allow it some credit in a rather indefinite way, and still others would not have any opinion at all. Now, as a matter of fact, there are many cases where the chemical examination of a clay would not result in the slightest financial benefit to the manufacturers. For instance, a man making common brick which are sound and hard and have a good color, brick which he can sell readily, does not need a chemical analysis any more than he does a Greek grammar. But supposing a man had the choice between two beds of clay, located about equally advantageous. It would obviously be his desire to take hold of the better clay. Of course, the first thing he will do is to test both clays practically—that is, he makes brick out of them. If he goes to work right he will be pretty sure to detect gross flaws in the character of the two materials; but would it not be a nice thing to know how much soluble salts is contained in them, so as to ascertain which one is the most liable to show whitewash? Again, if both clays are limy, it certainly must be an advantage to know which contains more. It seems to the writer that in such a case, wherever one has the choice of materials, a well-made analysis is a paying investment. But let us now turn our attention to the higher grades of clay ware. In manufacturing pressed brick chemical analysis is almost a necessity. It is essential to know the quantity of soluble salts; it is necessary to know in what shape the iron is present, as ferric oxide, carbonate or sulphide; whether bituminous carbon exists in the clay, and, finally, how much sandy matter goes along with the clay proper. The higher we go in the scale of ceramics the more important a place will chemical research hold. For instance, in the case of glazed ware, constant chemical examination will save many a dollar and take away most of the mysterious air surrounding the subject of glazes; in other words, it will put methodical work in the place of the rule of thumb.

But there are analyses and analyses. It must be confessed that there is something very dry and uninteresting about the average clay analysis; there are so many per cent. of silica, so many of alumina, lime, magnesia, potash and soda. What do these figures mean? It is true the amounts of lime and alkalies may tell the practical man something about the behavior of the material in burning, since the substances named are fluxes. Yet the whole does not succeed in conveying a definite meaning in regard to the make-up of the clay, its constitution, and, what is worse, the general analytical chemist does not try to interpret it for us. He gives us no key to unlock the peculiarities of the material, no clew to the difficulties we are liable to meet. His work ends with the bare enumeration of the elements.

Now, is it possible to convert the uncompromising figures of the chemist's report into expressions having an actual bearing upon our work? Science has not been altogether negligent of the clayworker's needs. It has given him methods for dividing clay into its foundational components, which represent the essential qualities of the clay, and it is the duty of the chemist to make his report according to this rational method. What are the essential qualities of clay? Are they not its plasticity, its color, its vitrifying and melting points? These qualities depend upon the constituents of the clay.

Plasticity is proportional to the base of the clay proper, the clay substance, or, as the chemists call it, the hydrous silicate of alumina, which we all know by its soft, unctuous feel; of course, the more of this substance there is present the more plastic will the clay be, and, at the same time, the more shrinkage will it show. It obviously is important that we know the actual percentage of this constituent regardless of its chemical composition, since it determines both plasticity, the property of being molded and shaped, and the shrinkage, which is such a great factor in our work. On the other hand, substances like quartz sand, hard minerals and the like, showing no signs of plasticity, naturally decrease the total plasticity of the clay, and it is well to know how much of such matter is present. Again, it is a well-known fact that the principal fluxes of clays are the alkalies and lime. Usually the former are present in the shape of insoluble minerals—that is, as alkali silicates, generally feldspars. The reason of this is easily explained. Since clays are the product resulting from the weathering of the old, the so-called igneous, rocks, which consist of quartz, mica, feldspar, hornblende and several other minerals, it is but natural to expect that fragments of these minerals, or what is left of them, are found with clays. Feldspar is especially prominent among these mineral detritus, for the clay itself has come from the softening of it; in fact, it may be said that it is a universal constituent. But we know that the typical composition of feldspar is as follows: Silica, 64.7 per cent.; alumina, 18.4 per cent.; potash and soda, 16.9 per cent. We notice that this mineral carries a high per cent. of the alkalies combined with the silica. Hence, if by analysis we find the percentage of feldspathic residue, we know at the same time that this acts as a flux. Experience has shown that this alkali-silicate, though helping to lower the melting point of the clay, causes vitrification to take place slowly; therefore, the danger of overburning the ware, if ordinary care is taken, is quite remote, unless lime or magnesia greatly overbalance the feldspathic flux. If the latter condition exists—that is, if lime, especially in the form of the carbonate, is in excess—the clayworker's security is badly disturbed. By the way, lime and magnesia are twin brothers. One behaves like the other. It is a notorious fact that lime in clay causes sudden fusion to take place, the vitrifying and melting points being very close together. A calcareous clay, for this reason, is very difficult to burn, and constant vigilance must be exercised at the critical stage. It also shows peculiarities in color and physical structure which make it unfit for many purposes, but also extremely desirable for a few. The hardest paving brick ever seen by the writer was made of a clay very high in lime, burning to a greenish color and showing a wonderful density. But it required the highest skill to obtain even approximately satisfactory results. For the application of tin enamels this kind of clay is very desirable, as well as for the manufacture of filters. The writer knows of a clay body used for the last-named purpose which contained 40 per cent. of lime. Of course, in this case vitrifaction was not desired, as it would have destroyed porosity.

Although not one of the foundational constituents of clay, like clay substance, quartzsand and feldspathic matter, iron may form a very important part. As has been repeatedly stated in these papers, iron may appear in three forms, as ferric oxide, ferrous carbonate and as sulphide, and each condition has an important bearing upon color, refractoriness and behavior in burning. This has been sufficiently discussed in previous numbers, but the writer wants to point to the fact that, although the shape of the iron present is of the greatest importance, yet the ordinary gross analysis reports simply the total iron, thus ignoring the very points which are of vital interest to the clayworker.

Last, but not least, the rational analysis reports those accidental, but only too often present, soluble salts, lime sulphate, which are the direct cause of efflorescence. This is another point usually neglected by the average chemist. Let us now put together the information given by the clayworker's analysis, as the rational method might be properly called. First, we are informed in regard to the percentage composition of the foundational constituents, clay substance quartzsand and feldspathic residue; second, we are told the contents of the secondary constituents, which include the determination of the forms of iron, the carbonate of lime and finally the sulphate of lime. It does not require very much of an imagination to assemble from these data a correct picture of the peculiarities of the clay with which we are dealing, when we connect the idea of clay substance with a plastic kaolin, that of the quartzsand with any sand, that of feldspathic matter with grains of feldspar, that of iron carbonate with pieces of spathic iron, of the iron sulphide with those hard, glittering grains of mineral known as fools' gold, of carbonate of lime with limestone pebbles, and finally of lime sulphate with plaster paris. These are all substances which we know, and of which we can form concrete conceptions, both as to their appearance and the way in which they behave in a clay. Of course, it must not be understood that the grains in which these minerals appear are of the same size in all clays. It is evident that they must differ in proportion to the treatment to which the clay has been subjected, and, according to the size of grain, their influence is more or less intense.

Considering the vast amount of work applied to the chemical consideration of clays in geological reports, it seems a pity that the rational method is not made use of oftener. It is true the manipulation of the "rational" involves more labor, but then the results are so much more valuable. The writer wishes to advise every clayworker who has an analysis made to insist on having it executed according to the above method. It may cost a few dollars more, but the extra expense will pay. Although these papers are not written for chemists, perhaps it will not be out of place to indicate the principle upon which the separation of the mineral constituents depends. It is very simple. The analysis consists of two parts—the first the usual gross analysis, the second the separation treatment. The latter depends upon the fact that clay substance proper dissolves in boiling sulphuric acid, while the quartz and feldspathic matter do not. By thus treating a clay with boiling sulphuric acid, and afterwards with boiling carbonate of soda, the clay substance is removed, and is known from the difference between the original weight of the sample and the weight of the residue. The mineral matter left behind is then analyzed with the aid of hydrofluoric acid, and we thus know its composition. From the percentage of alumina and other bases in the residue the amount of feldspar can be calculated, which, subtracted from the total residue, gives the amount of quartzsand. From the gross analysis we can calculate the composition of the clay substance. The other constituents, iron carbonate, lime carbonate, etc., are dissolved out from the clay by means of muriatic acid. Now right here is where the learned chemist will get in his say. Why, he will tell you this is not a strictly scientific process. The separation cannot be made perfectly accurate, since we do not find the minerals sharply defined, especially in the impure brick clays. This we will freely acknowledge. It is not a strictly scientific method, but, as has been proven by actual work, it is sufficiently accurate for practical purposes, and many times as valuable as the ordinary gross analysis. Any chemist not acquainted with the rational analysis has no business to work with clays.

In the next paper we will show the usefulness of this kind of chemical examination in a practical way.

AMERICUS.

A ST. LOUIS ENTERPRISE.

The Fernholtz Brick Machinery Co., of St. Louis, Mo., have purchased the plant of the Fernholtz Brick Press Co., and are starting out with bright prospects for the coming year. They will continue the manufacture of the Fernholtz improved brick press and the Fernholtz patent pulverizer and other brick machinery in their own shops, and have a thoroughly equipped repair department, manned by skilled and experienced machinists, in which they expect to accommodate all brick manufacturers who have need of repairs, no matter what machinery they use.

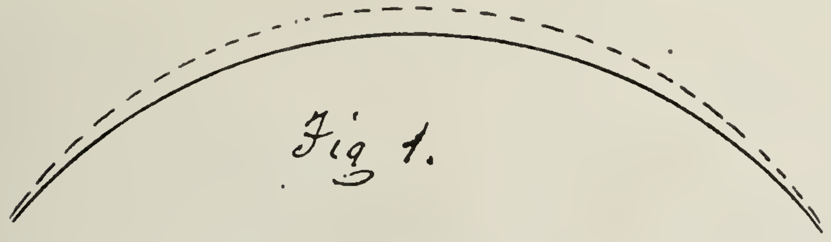
This company have quite a number of brick presses in active service, and they state that every user is their friend. The stockholders are most all practical machinery and brick men, and fully realize the needs of a modern brick plant, and have studied carefully to meet the requirements, and their success is proven by merits of the machine they make.

Any one considering the purchase of brick machinery would do well to investigate their line. They extend a cordial invitation to brickmakers visiting St. Louis to call at their shops, 1214 and 1216 Poplar street, and see how their machinery is made, and will also conduct visitors to the brickyards where the presses may be seen in operation.

Written for The Clay-Worker.

WHAT KILN SHALL I BUILD? No. 4.

HAVING CONSIDERED in the December issue of this journal the construction of kiln walls, and having made special reference to round kilns, in due order the question of *crown construction* should now be taken up. It will probably be conceded that no part of a kiln requires more care, skill and judgment in its construction, and for several reasons—first, because subject to the greatest heat, if we may except furnaces and fire bags; second, because the crown is naturally the largest source of heat waste, acting as it does as a storage reservoir of heat before the heat is put to service, and because it is subject to a *constant pressure* of heat, instead of the contact with heat currents as are the side walls. Yet, strange to say, the general practice is to give a crown but about one-half the thickness of the wall. Third, the weather conditions more largely affect the crown than any other part, forming, as it does, a lodging place for rain, snow and ice. Each in turn, especially when not under fire, working for its destruction, and, when under fire, the forces of expansion and contraction find the crown the most inviting field of attack. The spring of the crown, being held in rigid position by iron bands, when expansion occurs its only method of relief is that of lifting itself upwards, thus forming a new line of curvature, as seen in Fig 1, and in the crushing and partial destruction of its mortar joints, rendering them, to a greater or less degree, passage ways for the escape of heat to the exterior.



We will assume that the lower line of Fig. 1 represents the position of the crown when not under fire. If our kiln has a diameter of 25 feet, and a rise of 5 feet be given to the crown, and if, in the process of burning, the kiln be heated to 2,500 degrees Fahrenheit, which may be, perhaps, taken as a fair average of heat required for burning pavers, sewer pipe and shale and plastic fire clay products generally, we may assume that the brick forming the inner course and very likely the only course in the crown will be for at least one-half the length of the brick heated to at least 2,000 degrees, being less affected by the heat than the stock being burned, because of the rapid loss of heat by outward diffusion.

What does this mean in the matter of crown expansion? We answer about 5¼ inches in the increased circumference of the lower courses, decreasing toward the top in due proportion, and an expansion of two inches if measured across the diameter. In the nature of things this expansion crowds the crown outward and upward, increasing for a time its diameter and height, and in doing so and in settling back in position there must and will be lines of disruption at the weaker points, this tendency to disruption being aggravated by the fact of the material difference between the heat condition of the outer and inner ends of the brick forming the crown. The inner ends expanding most, the result must be almost as many checks as mortar joints at the cooler ends, measuring some inches in the aggregate when the total diameter is considered. We may be deemed as dwelling at undue length upon these details, since we went practically over much the same ground in treating of kiln walls, but we are dealing with the same class of facts and principles *under different and more aggravated conditions*, and it seems necessary to correctly diagnose these conditions, in order to find a remedy for the apparent ills, as the M. D.'s would put it.

We will let these facts stand awhile, keeping them in mind, however, while we take up another phase of the crown question, viz., that of height of crown, in order to answer the question of which is the better.

A HIGH OR A LOW CROWN?

By the term "high crown" we will designate one having a rise of one foot in a diameter of four feet, though there are many higher ones, and a low crown shall be considered one foot rise in each six feet and more of diameter. We think the tendency in late years has been towards a reduction in crown heights, and that the tendency is a healthy one. The advocates of the low crown may properly contend that the high crown compels the maintaining of heat in a larger unoccupied area of kiln, and that this means a larger crown surface for carrying off and wasting heat and for keeping in repair, and entails an unnecessary addition to the cost of construction. What do these claims amount to? Let us take a 25-foot kiln having a rise of 1 to 4 feet and compare with one having a rise of 1 to 6 feet of diameter. We find that the higher crown has about 90 superficial feet more of masonry construction, or, say 15 per cent. more of surface for carrying off heat, and adding an equal per cent. to cost of building and repairs, and, since most of the loss of heat from a kiln is through its crown, this 15 per cent. of saving is no inconsiderable item. On the other hand,

THE ADVOCATES OF THE HIGHER CROWN

May present the greater danger of the slumping or flattening of a low crown, its earlier disintegration requiring more care in maintenance, and its comaparatively shorter life arising in part from the fact that the stress of the thrust thrown upon the wall bands is greater, and that, in consequence, the mortar joints are more sure to crush and crumble. While in the light of experience we are not ready to concede all that is claimed by the high-crown advocates, we are ready to believe that a high crown of the same grade of workmanship as a low crown will keep its shape longer than a low crown, but that, nevertheless, it will be more wasteful of heat, because of the larger exposure of surface. We have no evidence tnat leads us to believe that, other things being equal, the life of the low crown will be any shorter than the higher one, and that the net gain an equal per cent. to cost of building and repairs, and, from the reduction of surface of the low crown may be the saving of 15 per cent. or more of heat accruing therefrom.

These facts and conclusions naturally lead us to the consideration of the care needed and that should be given to the construction of a kiln crown. We have been gathering from variou sources information as to methods of construction pursued by intelligent and sucessful manufacturers East and West, some of which we now lay before our readers.

A SUCCESSFUL OHIO MANAGER,

Who is a practical man, writes: "Our 26-foot diameter kilns have a 4-foot rise of crown. In starting the crown we use end and side skewers, and then for the remainder of the crown use straight brick, with keys in about every fourth or fifth course. The flatter the crown the more keys will have to be used. What fire clay we use is put on with a trowel, in the form of mortar." It may be noted in passing that the 26-foot kilns of which our correspondent writes are recently built, and, therefore, represent his latest conclusions.

A DOWN EAST MANAGER,

Well known as a contributor to the interest of our National Conventions, writes of the heights of crown of his kilns that he has a great variety; ranging from nearly 1 foot rise of crown to 4 of diameter down to 1 foot in 7 of diameter. He says of his last kiln built, the crown of which had a rise of a little more than 1 in 4, that, was he to build again, he would reduce it in height 20 per cent. He says of the height just what we have already stated: "The only advantage in making a high rise is the fact that it does not require so much masonry and iron work to withstand the thrust of the arch. It is generally the practice to take bullhead or wedge brick, and, daubing them with fire mortar with the trowel, to lay them in as snugly as possible. This is the way our last crown was laid, but," he adds, "I do not believe it is as perfect practice as ultimate economy demands." Our third citation shall be gathered from an interview recently had with the intelligent manager of

A LARGE ILLINOIS CONCERN

Having thirty or more round down-draft kilns running from 26 to 30 feet in diameter, and used in the manufacture of plastic fire clay wares. We noticed that the crowns of most of these kilns were quite low, and, commenting upon it, we were told that he would make the rise of new kilns, were he to build them, "less than 4 feet in 26 of diameter, rather than more." As to the manner of laying the crown, he stated that they were of common-shape fire brick (not wedged), and were laid with the use of a trowel. We noticed that the crowns of the kilns in the yard referred to had lost the true line of curvature from a point midway to the center of the kiln.

We think the quotations and statement made will fairly place before our readers a fair average of what may be called good practice in crown construction throughout the country at the present time. It will be noticed that our Eastern manufacturer, in deference, no doubt to the higher cost of coal in New England than in Ohio and Indiana, uses only wedge-shaped brick. These were used only in about one of five courses in Ohio, and not at all in Illinois, the use of wedge-shaped brick resulting, of course, in a lessened use of mortar in making a joint. In each case the kiln crown consists of the one course of fire brick laid as headers, though our Eastern manager suggests that, "if the kiln is out of doors, a platting of brick laid flatwise might be used in protecting the fire brick from the weather." The professional kiln builder has much to do, we may suppose, in setting the standard, and he, no doubt, goes just as far in the direction of high-grade construction as the competition he meets and the compensation he receives will warrant. We venture to quote a few paragraphs from a little pamphlet of W. A. Eudaly on this point: "The skew back for the crown should be cut from good fire brick, to fit accurately with the proper pitch." "In kilns of small diameter it is very important, if not absolutely necessary, to have the crown brick cut or made to fit the proper radius." "It is always the best to use several courses of end wedge or radius brick in the setting of any crown." And again: "I do not believe a mortar trowel should ever be used in building a kiln crown."

It will be seen, then, that the theory of the intelligent professional kiln builder is far ahead of the practice which prevails, and we have reason to believe that the kiln builder rarely carries out his own theories in practice, because his client doesn't find it convenient to furnish the proper material. It is too much trouble to get wedge brick, when the other thing "will do, you know." In *practice* a standard has been set which few are far-sighted and painstaking enough to break away from. It has come to be considered by most manufacturers that a certain grade of kiln for certain uses has about so many years of life; that it must (especially the crown), after the first few months of use, be treated as an invalid, to be doctored and doped after each sucessive heat—if the manager is of the painstaking sort—and that, to cover repairs and depreciation, 15 per cent. per annum of its original cost will be none too much to meet the requirements. We have no doubt that this is true of kilns as ordinarily constructed, but we believe that 10 per cent. is ample if kilns are properly built, and that this difference of 5 per cent. saved, which, on a kiln of 25 feet in diameter, may mean a saving of $60 to $75 per annum, is, after all, but a small part of the savings to be made, if a uniform burn and the saving of fuel is taken into the account. We are naturally brought to the consideration of the question,

WHAT IS HIGH-GRADE CROWN CONSTRUCTION?

We will endeavor to answer the question, and we begin with the foundation, which should be carefully leveled in the use of well-burned brick, and not of a spread of fire clay of uneven thickness. On this solid and even foundation of burned clay should be laid the skew backs on which the crown is to rest. The radical lines from the upper surface and sides of which should meet at the common center from which the circle of which the crown forms a segment is described. Every brick laid in the crown thereafter should be cut or pressed to such form that its longer sides, when laid, shall point to the same center, or, in other words, should be of a wedge and key shape. Let us see just what shapes would be given to a brick for a 25-foot kiln crown having a rise of 1 foot in 4 of diameter, and the brick being 9 inches long and 4½x2½ at the butt, this being standard size of fire brick, or assumed to be. Such a brick, cut to proper shape for our purpose, should be at the small end 4 3-10x2⅜ inches. Such a brick held at the butt and dipped in a smooth (without lumps) slush of fire clay, so thin that not more than a coating of 1-16th of an inch will adhere to them, quickly laid in position after dipping, will make, if the brick are free from surface projections or pimples, as perfect a crown as can be laid without a supporting framework, and such a crown should have double the life and double the freedom of demand for repairs through its life, and meantime secure to the user more uniform results, and with a lessened amount of fuel, objects, as all will acknowledge, well worthy of being sought. We believe such results may be had with very little added cost to the builder; and why and how, may be asked. We take things as we find them in making our reply. Fire clay lined and crowned kilns are usually laid in a fire clay region of supply, not always, but usually. After the building of the first kiln or two clay manufacturers in such regions make their own fire brick. If this is done in the use of a press, it will require but an investment in a single die, and a little increased care in the subsequent handling of the product before laying. Each brick should be inspected and any projections on the sides removed by rubbing or otherwise. When once in the hands of the setter they can be laid as rapidly as if a trowel be used instead of a dip. But many kiln brick are made in the use of auger machines, in which case a special die of proper form to secure the one taper will be needed, and the other can be secured in the *cutting* operation, if performed by hand on what is termed a "combination" cutting table, which tables are commonly found in such establishments.

Now as to the "why?" It is evident that when common shape brick are used in a crown that the addition of one-fifth of an inch thickness, which is required in the butt of a crown brick, must be made up by an increased thickness of the mortar joint at the butt of the brick. It is also evident that the evil is greatly increased as the diameter of the kiln is reduced, so that in a kiln 15 feet in diameter, the crown, having a rise of 1 foot in 4, will require, if straight brick are used, a joint three-eighths of an inch thicker at the butt. You will tell me that in such cases wedge or key brick are used. This remedies the matter to a considerable extent, but only in part. Key and wedge brick are each tapered only one way, and this leaves the taper required of the mortar joint on either top or side still necessary, and what provision is made occurring but once in four or five courses, as suggested by our Ohio manager, leads to a system of "give and take," and leaves too much to the skill and carefulness of the operator.

These methods are responsible for the flattening and uneven kiln tops to be seen everywhere, leaky they are sure to be, the thick clay joints, burned at the inner end of the joints and unburned at the outer end, are subject to the constant seesawing of the brick, as expansion and contraction take place, the mortar joint being the weaker, crumbles, and, as a consequence, the crown flattens. We quote from two of the authorities already named in support of our position, although we deem that no quotations are needed to prove our case.

OUR EASTERN MANAGER

Is already on record as saying (referring to his own manner of using trowel in setting), "I do not believe it as perfect practice as ultimate economy demands," and he adds, "I think the brick should be dipped in a slip and rubbed together and no trowel used, except, possibly, to scrape off drippings."

In answer to a question asked, he further stated: "The question of grinding arch (crown) brick is an interesting one, and I do not doubt it paying a manufacturer, who was building a kiln to stand many years (and who would not desire this? Ed.) to build thus. * * * By this plan you could build a crown that would stand probably twenty years without a dollar's worth of repairs."

Mr. Eudaly, whose little pamphlet has already been quoted from, says: "Some of the best crowns I have ever had built, the brick were set *dry* to the form, the mortar being made thin and poured in from the top afterwards." He evidently refers to straight *arches*, for he is found saying later, "Of course this cannot be done in building crowns upon round kilns for the reason that round kiln crowns are usually built without the uses of centers or form boards."

We must defer mention of arched crowns until another paper. **Flame.**

Written for The Clay-Worker.

BRICK PAVING IN PEORIA.

By A. D. Thompson, City Engineer, Peoria.

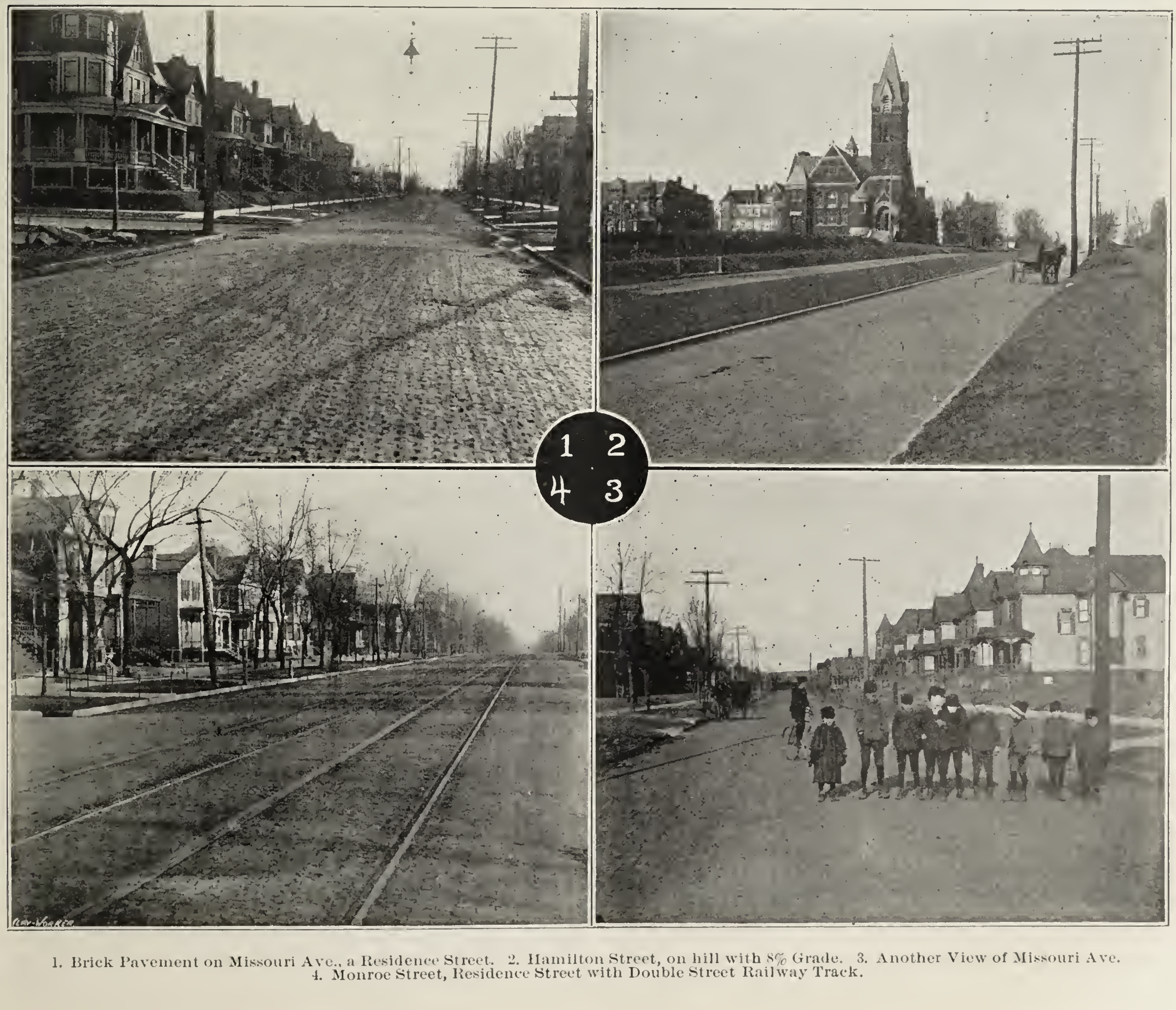
THE CITY OF PEORIA, Ill., was one of the first cities in the United States to regularly adopt brick as a paving material. Previous to 1885 several cities had laid small experimental patches of brick pavements, but its merits were not admitted until that year, when several cities adopted it as one of the standard pavements. Peoria was among the latter cities, and in 1885 laid its first brick pavement on Hamilton street, from Adams to Monroe, a distance of three blocks, comprising 9,226 square yards.

This pavement consisted of a layer of small brick, laid flat, upon a foundation of six inches of gravel. After tamping this layer firmly, a cushion of sand, two inches in thickness, was spread, and a layer of brick, on edge, placed thereon. This was the method of construction used in the original experiments, and is in use in many places at present. Vitrified paving brick was at that time an unknown quantity, and the bricks used in the above work were the hardest burned building brick that could be procured in the vicinity. This pavement has never been repaired, and has been frequently opened for service connections of all kinds. While its condition is not good at present, as the surface is rough and the bricks badly worn, yet it has shown a surprising wearing capacity. The service given by this street, laid with such a wearing surface, on an unstable foundation, would indicate an almost unlimited life on a street with moderate traffic, with the pavement constructed of a tough, vitrified paving brick, supported by a solid foundation of concrete.

This work gave such excellent satisfaction that brick pavements were constructed for several years, almost to the exclusion of other kinds, and there are now 19.72 miles of such pavement in the city out of a total of 29.61 miles of all classes, or nearly 67 per cent. of all the paving in the city is composed of brick.

The method of construction has changed considerably from that described above. From 1885 to 1893 all brick pavements, with a few exceptions, consisted of a block 3x5x12 or 4x5x12, laid in a single course on a six-inch gravel or sand foundation. The exceptions to this method were three short streets with a concrete foundation, one with a macadam foundation and one using two courses of small brick on gravel. These large blocks were manufactured in the city and one or two neighboring cities, to which their use has been confined.

Early in 1894 a careful examination of the pavements of the city and a long series of comparative tests showed the great superiority of the small bricks for paving purposes. The size of the large block prohibited a thorough vitrification without overburning the outer portion and warping the brick sufficiently to make it useless. A large number of defects were



1. Brick Pavement on Missouri Ave., a Residence Street. 2. Hamilton Street, on hill with 8% Grade. 3. Another View of Missouri Ave. 4. Monroe Street, Residence Street with Double Street Railway Track.

also noticed that were attributed to the gravel foundation. For these reasons a single course of brick upon a concrete foundation, with a one or two-inch sand cushion, was adopted as the standard, and all pavements of brick have been constructed since that time in this manner, excepting one street laid early in 1894.

The concrete foundation on streets is six inches in thickness, excepting on two of the heaviest traffic streets, where it was increased to eight inches. On alleys this foundation was used four inches thick, but, as this proved insufficient, the thickness was increased to six inches in 1895. Peoria has not experimented with the various fillers, as the filling of the interstices with fine sand has proved satisfactory in most cases, and costs from ten to fifteen cents per square yard less than cement, tar or asphalt. On streets where the grade is above four or five per cent., or so steep that the sand filler will wash out, a filler of Portland cement grout is used.

The specifications for brick pavements do not limit the materials to any particular kind. Definite requirements for sand, stone, cement and brick are given, and any materials which meet these standards are accepted, thus throwing the matter open to the broadest competition. Each car of cement is tested after delivery on the work for fineness, setting, color and strength.

Laying Intersection of Shipman and Third Ave., Peoria.

Samples of each lot of brick delivered on the work are selected and are given the absorption, cross breaking and rattler tests. The standards adopted guarantee the highest grade of materials, and the requirements are increased each year, thus forcing the manufacturer to increase the quality of his product.

The following is a statement of various methods of construction used in the city, together with the amount of paving laid under each:

SMALL BRICK.

0.79 miles..	1,904	square yards, 8-inch concrete foundation.
9.67 miles..	224,921	square yards, 6-inch concrete foundation.
0.94 miles..	9,578	square yards, 4-inch concrete foundation.
miles..	3,016	square yards, 6-inch gravel.

TWO-COURSE WORK.

0.31 miles..	9,902	square yards, 6-inch gravel, small brick.

LARGE BRICK.

6.94 miles..	168,150	square yards, 6-inch gravel foundation.
0.74 miles..	23,154	square yards, macadam foundation.
0.42 miles..	15,426	square yards, 6-inch concrete foundation.
19.81		

A CONVENTION ECHO.

Novel Suggestion for the Restriction of Competition.

Editor Clay-Worker:

You will remember that I stated at Convention at Columbus that the agents of certain manufacturing plants, canvassing the whole country, have not confined themselves strictly to selling the product of said factories to brickyards already established or companies already organized. No, this is not going fast enough. The man whose yard is already equipped, and has not realized enough from the business to pay for the machinery on it, must have opposition in order to make it real lively. These same agents act as a sort of smelling committee, going up and down the country scenting shale and clay banks, inducing the owners or organizing companies to start up in the business of brickmaking, regardless of the question of supply and demand, or justice to the one who has patronized them, thereby creating four or five yards whereas there ought to be only two or three, as the case may be, to supply the demand existing at the time—anything and anyway so they get in their work and allow the poor brickmaker to eke out a living as best he can. Only this week I encountered a case similar to that described in the Convention, namely: A yard for making paving brick at Allentown, Pa., was started, operated one year, and now permanently shut down, making brick, some of which were put down in Phillipsburg, Pa., and turned out so badly that the people have condemned all brick made of shale on general principles. Now, who does not know that the Canton, O., brick have always stood at the head of the list in all tests made until recently, when Booth, Garrett & Blair, of Philadelphia, authorized to make tests for the bureau of highways of that city, placed the Guise brick between six and seven points above the Canton brick. Yet with all this and many other things in their favor the prejudice could not be overcome, and as a result the Guise brick were turned down. I cite this simply to show how easy it is to cause these annoyances, yet both of these brick are made of shale.

Again, while at the Convention a member of the association who is a brickmaker, and resides at Wilkesbarre, Pa., stated to me that there were six yards at that place engaged in making brick until recently, when one of these energetic agents induced a party to engage in the manufacture of brick, making the seventh. Two of this number have since been closed out by the sheriff. I could continue to cite other cases within a radius of thirty miles of this city which have been closed out by the sheriff or have lost a large amount of money. In addition to this, take the long list of yards advertised for sale in the Clay-Worker and many other periodicals at the present time. This will be sufficient explanation in itself.

How any one can be so shortsighted as to be unable to see or understand that ultimately the evil effects of this course will be so far reaching that every dealer in brickyard supplies will suffer immeasurably more than if the same amount of energy were put forth in the manufacture of none but the very best quality of paving brick, which would increase rather than diminish the demand for brick, and eventually cause a larger demand for brickyard supplies—a fact that any sane man can readily understand. Question—What remedy should be applied? Answer—The manufacturer has it within his grasp. In connection with this I would suggest that the association adopt a resolution whereby every member would be obligated to not patronize such parties guilty of such an offense hereafter. The question of prerogative may be raised. Then I answer, was not the association originally made up of brickmakers? Is it not so recognized now? Then who dare say them nay? I appeal to all brickmakers to stand together as one man and assert their rights and enforce such measures as will protect their interests in future time. Yours truly,

D. P. GUISE.

Written for The Clay-Worker.

A BRICK FACTORY IN A WOODEN TOWN. No. 11.

(L. C. M.)

IF THE BRICKMAKER must make experiments he should study well the conditions surrounding him, and gain from study whatever facts are possible to collect together before commencing his experiments. If he will read the Clay-Worker carefully he will often find that some one before him has passed over the same grounds and left information on record that will serve as a pretty good chart to guide him in his efforts. And though conditions may vary in different localities, for the term "clay" is a very indefinite one, still there are general principles in every science and art that hold good for all times and places.

When a man writes about his clay and his method of handling it, you may not be able to fully appreciate what he says, because you cannot know the full meaning of the term "clay" in his locality, nor can you understand all of the conditions under which he operates. Still there are so many valuable hints contained in the pages of this journal that one suffers a great loss if he does not gain all of the information he can from this source.

I stated above that the reader cannot fully take in the conditions and surrounding as described by the writer on manipulating clay. The whole truth of the matter is that the writer himself is often in ignorance of much important data that would have been of great assistance to him in conducting his experiments and in deducing his conclusions therefrom. In conducting our experiments we are often like the old lady while crossing the narrow footbridge. We watch one side of the bridge so closely that we tumble off the other. We make one trial of a certain method or mixture, and, after looking at the results, jump at our conclusions much as a cat jumps at a rat, and condemn it without reserve if it seems to be a failure, or give it our entire confidence if it is a seeming success.

The true scientist is a great doubter. If he fails to produce the desired result at the first effort, he doubts his own arrangements of the various elements which enter into the experiment, and withholds his conclusion until he can further investigate the matter. And often years of failure do not daunt him when he is confident that a hidden truth lies buried beneath the rubbish of ages. Neither is he overconfident in the result of a single experiment when success seems to have crowned his efforts. For he is not sure that he has at his command all of the facts or data that will enable him to repeat the experiment and produce the same result with unvarying success.

So must the brickmaker be careful in forming his conclusions and investing his money, even when there seems but little cause for doubt. He sends his clay—a small quantity—to the machine man to be tested. The result is all that one can ask—a few bricks as perfect as the best skill can make them. He concludes that his clay is all right, orders a machine from the man who made the test, erects a factory at considerable cost, puts in the required engines, boilers and all of the necessary requirements of a modern outfit, stores a lot of clay that he may not run short when prospective orders for his fine product come pouring in, builds a battery of kilns sufficient for the capacity of his brick machine, and then engages a force of men and commences work.

The result often is that a modern brick plant is sold at auction. Clay that tests well when tried by the manufacturers of machinery does not always prove satisfactory when called upon to make brick by the millions. There is a strange perversity about brick clays that often proves too difficult for the management of ordinary brickmakers, and we would do well to go slow on the expense until we have proven our ability to manage our stubborn material.

But the mistake is not always an overconfidence in the result of a single experiment. We often condemn the best material within our reach because we think we have given it a sufficient test. Our neighbor tested a bank of clay, decided that it was worthless, but to-day the finest brick in our country are produced from this bank. Too often we grope in the dark, paying no heed to the light that the plainest teachings of science or common sense would furnish us, and miss the reward that intelligent effort would surely bring us. The clay bank that was worthless a few years ago, which could not possibly have been used by the old methods of handling clay, is now a mine of wealth to its possessor, and under the new regime of brickmaking furnishes the raw material from which is produced the finest of pavers or the most beautiful of front brick.

I remember an old bluff over which I clambered in my boyhood, knocking off slivers of the soft stone to whittle into slate pencils with which to "do" the sums of Ray's arithmetic. It was a rough piece of waste land, not worth ten cents per acre. And yet I would give a snug sum of Uncle Sam's notes to have that same bluff dropped down in close proximity to our factory. Not for my boy to climb over as I did, but to make good, hard bricks, better than can be made from the yellow clay of our bank.

(To be continued.)

A MEDAL OF HONOR.

The Secretary of War Sends E. M. Pike a Token of the Nation's Appreciation of His Heroism.

Among the few soldiers of the civil war fortunate enough to secure one of the medals of honor voted by the act of Congress to those entitled to them for distinguished services is our good friend, E. M. Pike, of Chenoa, Ill., who received the medal recently from Secretary Alger. Mr. Pike was entitled to it as reward for bravery in the battle of Rock River, Ark., which was fought on the 7th of July, 1862. Mr. Pike was first sergeant of Company A, Thirty-third Illinois Infantry Volunteers. He was one of the Normal students who joined the students' company of that regiment in August, 1861.

A member of Mr. Pike's company tells of the incident thus: "As soon as it became certain that we must fall back, the first thought was to save the little steel cannon. The driver swung his team into place, the gun was hooked on the caisson, the gunners scampered back under cover of the woods, and yet, oh, misery! there stood our little cannon. The soldier heart always bleeds to see a flag or a piece of artillery fall into the enemy's hands. At the first jump of the team the quick start had thrown the cannon from its fastenings. The bold driver was wounded and could not at once bring his horses to a stand. In the midst of a fierce storm raging about us. Captain Potter coolly said: 'Steady, boys; save the gun.' Sergeant Ed. Pike, of our company, ran up and grabbed hold of the cannon with one hand, his own rifle in the other, and, with the strength of a giant and the assistance of one comrade, ran the cannon down the road, hooked it on the caisson and the team galloped to the rear and saved the gun.

"The rebels were all around. The nearest horseman was almost close enough to have struck Pike with his saber. The rebels were, however, completely dazed by the supreme audacity of the movement."

Mr. Pike has the old blue cap which he wore at the time, with a big bullet hole showing his close call, and he can now proudly add the medal to that valuable relic.

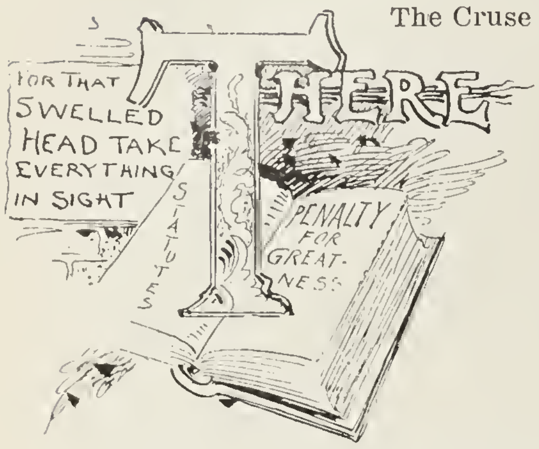
For cheap machinery the reader is referred to our For Sale Columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear machinery in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the "Wanted, For Sale, etc." columns a means of satisfying their needs.

Written for The Clay-Worker.

A CONFESSION OF GREATNESS.

How it Feels to Get the Mramor Strudtse From a Whole Community.

The Cruse of the Nancy Purrington.


FOR THAT SWELLED HEAD TAKE EVERYTHING IN SIGHT
STATUTES
PENALTY FOR GREATNESS

THERE ARE PENALTIES attached to greatness. You have heard that before, haven't you? Now, without being in the slightest degree egotistical, I must confess to being great. But I am not rich. How often I have been stopped on the street by some old acquaintance and told of my great ability. It is pleasant to be told this in all sincerity. And when the old acquaintance has got me talked into a nice, pulpy state of self-satisfaction he generally winds up, about the time I have acknowledged that by the help of my wonderful gifts making money is like finding it—he winds up by saying:

"And, by the way, old man, do you happen to have a fiver you don't need until to-morrow, when I'll pay, sure? If you 'ain't in I'll leave it for you."

After ten or fifteen minutes, when the veneer of soft soap with which the old acquaintance has enveloped me has worn off, I feel that I am, after all, only a "good thing," and only need a puff of wind to be pushed along. Of course, after that the old acquaintance avoids me as he would a deputy sheriff. Of course, it is easy to say I am well rid of him at that price, but if I must get rid of all my old acquaintances at that rate it will only end in my working the same old racket myself, but I'm afraid I wonldn't succeed.

DO NOT LEND MONEY TO STRANGERS FRIENDS
Ledorov from a sketch by Ledorov

Striking for a Fiver.

I used to live, you know, at 41144 Easy street, Chicago, and the list of my friends comprised the city directory, but one day misfortune came in through a basement window, which had been inadvertently left open over night, and—well, you know how misfortune can go through ones clothes when one is innocently snoring the happy night away.

Well, when this, my mishap, became known it seemed to me that the whole populace turned out en masse just to give me the mramor strudtse (perhaps you don't know that that's Bulgarian for marble heart). I made a few touches in quick succession before I discovered that all my old friends had put a double row of rivets on their pocketbooks, and had placed a battery of quick firing Hotchkiss guns in front of their bank accounts. My creditors posted pickets all around the outskirts and overskirts of the city, and had spies watching all the brickyards, so I wouldn't escape them, but they never suspected that I would outwit them by the way of the water side of Chicago. That I would take to water in any form was beyond their calculations. The friendly captain of a brick schooner, the Nancy Purrington, let me hide on board his craft. My creditors had an inkling at the last moment, and searched the vessel, but they couldn't find me. Ha, ha, but Captain Marlkiln, of the Nancy Purrington, was too sharp for them. He stowed me away under the brick. I should judge that there were 18,260,000 brick piled up on my valuable person, but my lake-faring friend assured me there was less than a ton of brick reposing on me. We sailed away from Chicago one glorious, smoky July morning, and it was the second day out before the hardy mariners thought it safe to remove the brick barrier between me and my creditors. The weather was rough though sultry, and the cargo shifted a good deal, and I shifted with it. I am not exaggerating when I say that the brick were becoming slightly burdensome. I had a few sandwiches in my pockets, and I didn't suffer from thirst, for there was a hose playing on the brick frequently, so that water was let down to me occasionally, and I could drink it. It was very hot weather at the time, and it was necessary at frequent intervals to drench the brick for fear they would become so heated by the rays of the sun as to set fire to the schooner. During my stay under the shelter of that brick I had the finest opportunity for uninterrupted thought and planning for the future that I had had in years. The recollection of that lake trip is still too fresh and painful in my memory for me to go into further details.

ALL IS LOST BUT HONOR, APPETITE AND THIRST.
POST COLLECT NO BILLS
ZERO
Ledorov

Meeting a Rich, but Frosty Friend.

BASEMENT WINDOW NO ADMITTANCE ESPECIALLY ON BUSINESS
DELIVER ALL GOODS IN THE REAR — AND ALL BADS IN THE FRONT.

How Adversity Enters.

Even now, after three years and more have elapsed, and I have again ventured into my old haunts, scarcely a week passes that the doctors do not extract from some part of my anatomy a stray particle of brick that has slowly filtered through my system. You see while I was under the brick little pieces were all the time getting into my ears, eyes, nose—everywhere, in fact, where I wasn't hermetically sealed.

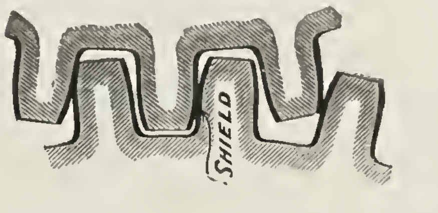
How I Emerged from Chicago.

I would rather be right than be president (of some banks I know of), and I would rather be wrong than leave Chicago again. And that's not saying that I am not stuck on New York. I merely want to conclude by gracefully conveying the impression that I am not the only great man who has had his troubles. Alick the Great, Jule Caesar, Pete the Great, Chauncey Depew, Napoleon, and even Mark Hanna, have had their troubles and been on the narrow gauge.

CHARLES LEDERER.

LUBRICATION OF GEARING.

The lubrication of the teeth of gearing is a subject of far greater importance than ordinarily accorded it, and well worthy of careful investigation. The too prevalent idea that waste lubricants from bearings, engines and machinery generally are good enough to apply to gear teeth is doubtless based on the usual conception that gearing must wear by reason of friction contact in the transmission of power, and that its life is dependent solely upon how well proportioned for its work, and more especially where failure occurs through wear, to the working pressure per inch of bearing surface provided in its construction, without regard to lubrication. A moment's reflection will convince the reader as to the vast difference between the lubrication of a bearing for a revolving journal and that of gear teeth, in which even the rolling effect at pitch line may be lost through inaccuracies of ordinarily constructed gear teeth, and partake of sliding frictional contact, incident to engagement at other points than the pitch line in carefully prepared gearing. Gear teeth are constructed to have as little practicable side clearance between the teeth when engaged, consistent with the method of production. Perfect working gear teeth would be those without side clearance, and approximated only in cut gearing of the finest pitch, while ordinary commercial cut gearing have from 1-64 inch to 1-16 inch, and gearing with cast teeth from 1-16 inch to ⅜ inch initial side clearance approximately for various pitches. The shock from irregular loads is imparted to the opposite sides than the regular bearing surfaces of teeth in hammer blows of strength consistent with varying loads, and distance of travel in side clearance (commonly termed back lash) before requiring reverse contact. This alternate action on opposite sides of the teeth tending to crystallization and breakage is suggestive of the method adopted by a blacksmith to break a bar of iron, when, after nicking, he subjects it to sledge blows alternately from opposite sides. Since the side clearance exists only from necessity and practical reasons assigned, the retarding of wear and its consequent increase of side clearance is essentially important in lessening the ill effect of back lash. Gear teeth having an initial side clearance of 1-64 inch will, by wear of only 1-64 inch each on contacting teeth, produce a side clearance of 3-64 inch, or an increase of 200 per cent., and thus contribute a greatly intensified shock to hasten destruction. The successful lubrication of journal bearings depending upon the ability of the lubricant to reach and enter restricted spaces and its freedom from tendency to form a built-up deposit, admirably adapts petroleum products for such lubrication, while it is equally evident from the action of gearing described a lubricant to satisfactorily answer its varying requirements must possess tenacious qualities to adhere and build a deposit on the working surfaces of teeth, thus preventing metallic contact and consequent wear and noise, and with a like deposit on the opposite sides of teeth reduce side clearance and form a cushion for back lash, greatly decreasing noise and destructive action. The accompanying illustration shows in the heavy lines on the sides of the teeth the effects of application of a material known as gear shield, in which the above described results are attained, evidenced in the prolonged life and greatly decreased noise of gearing, on which it has been used in widely varying lines, from the fast running motor gearing on street cars to the most ponderous and heavily dutied gearing of rolling mills. Its efficiency in avoidance of expensive replacements has also been demonstrated on many gears not in themselves severely dutied but subjected to detrimental influences, such as dusty, gritty or other flinty atmospheric conditions favorable to rapid wear. This gear shield is manufactured by the Ironside Company, Columbus, O.



WILL RETURN TO ENGLAND.

The brick town of Momence, Ill., where the works of the Tiffany Enameled Brick Co. are located, is lamenting the loss to that community of Mr. Issac Hardy, who is disposing of his property there, preparatory to returning to the mother country, where he will again take up permanent residence. Mr. Hardy went to Momence less than a decade ago, and took charge of the brick works, and was soon turning out a fine grade of enameled brick, and now the word Tiffany on enameled brick stamps it as first-class in every respect, the equal of the best imported ware.

Mr. Hardy writes that he deeply regretted his inability to attend the Columbus Convention, for he will probably never have another opportunity of meeting with the members of the N. B. M. A., as he does not expect to return to America. He says the reports sent him from England indicate very great prosperity in all grades and in every class of brick and terra cotta manufacture throughout the whole of last year. The demand could not, in all parts of the country, be anything like supplied, and this year the prospects are still better for a larger demand. The demand for enameled brick has been so large that two new works have been erected, and the larger works have had to increase their output, while the use of glazed and unglazed terra cotta is very greatly on the increase. There is no need to discuss the question as to how to increase the use of brick over there. Mr. Hardy's sons will succeed him as superintendent of the works at Momence.

Written for The Clay-Worker.

THE NEW YORK MARKET.

THE BRICKMAKERS are preparing for a full output the coming season, if the labor is to be had, and it does not rain all the time. The sun must be disgusted for not getting a chance to let the light of his eye shine on one of the most thoroughly-soaked sections of this land. The weather has settled down to a small part sunshine, and the rest—snow one day day and rain the next.

The preparations for an early start are evident, and the only holdback is the wet weather, and some will take chances on that. The returns of 1898 were so much better than for the past four or five years that the improvements made this year will be far in excess of many years past.

—Brickyard Tribulations.—

The old saying that in doing anything it is worth doing well, should apply to the fitting out of a new yard as well as in any other line of trade, and more especially where the owner is an old brickmaker, and back of that has plenty of money to do the job in good shape. How often is that which should have been done at first made imperative later at an increased expense.

It is well to build with as small a cost as is compatible with safety. Circumstances and land formation very often requires afew dollars to be spent that would prove money well invested. When a line of posts are set up for shafting to convey power to the machines, where there are six or eight machines in use, it forms quite a long line, as the shafting is twelve or more feet above the yard level and no embankment built, except where the machines stand, and only one brace to each post, it gives the whole line a good chance to sway, and in a few years the posts at the ground point begin to get soft, giving still better play. Down comes a length of shafting by the spreading of the posts. "How's that," some one wants to know, because he has had no experience on his yard with his line of shafting falling, simply because all points were carefully taken care of at time of erection. How many lines of shafting on the average yard has the full complement of bolts put in at each coupling? In many cases, none at all will be found.

Another cause for trouble is to be found which did not exist when sod pits came in general use, and that is that the pit embankment is set up well so that the pit shoveler does not have to lift his shovel of clay as high as his head. The two machine posts are set, and are heavier than the line posts; then logs six or eight inches thick or piled one on top the other, and the filling in is begun from the pit. The logs may be a little longer than the pit bottom, but, as they are only to keep the embankment from running out behind the machine, and the space on the sides and back does not require anything to retain it, for if it washes away it can be replaced at any time. When the pit is finished the bottom will be above the middle of the machine and back against the logs, and the pit will be built of two-inch plank and nailed to the machine. Then the pit is ready to be filled. The next time you see it it is filled with clay—and well-filled at that, clay piled up above the top of the machine—and thus it goes on for some years. Then the trouble begins. It is slight at the start, but bound to get worse and more expensive each year. The weight of clay bears against the back of the machine, and is given great help by the drivers of the carts loaded with clay backing too far in when putting on the top clay. This all finally results in racking the machine out of line. Once get a thing of that class out of plumb and a continued dumping of clay against it, the crown wheel must be raised to get the machine up, and I do not think any one on the yard, from foreman to sand boy, likes to monkey with the raising of a crown wheel. In the foreman's case, he may stand by and look on and order the man who is using the sledge to strike harder, and in a tone that rather hurts the one who is doing all he can in the small space he has to work, but he makes the supreme effort of his life in the next blow, touches some of the belts or shafting, misses the start and strikes something else and breaks the handle of the sledge. Then the foreman opens on him, and he replies by telling the foreman to go where crown wheels are not in use, and goes about his business—that is, to some other yard. As to the boy who is holding that start, it is a well-known fact that he does not worry much about any work, and that kind in particular, as he he says he might get killed. It is a wonder that he has not been the cause of the injury of the others, as he will watch the sledge and never mind how the start is held, on the key or not. Well, after much time and temper, it is raised and the machine is set up, only to have to repeat the same job a little later on.

Another phase now comes to the surface and that is, the falling of a piece of shafting. Well, it seems strange that a line of well-bolted coupling should fall apart, but why not? How long is a one-half-inch or five-eighths-inch bolt going to hold, especially when the strain is all on the pull apart principle. No doubt some of this could be obviated if the engineer would go over the line of shafting each day and look at each coupling; he then could detect such defects from the start. The engineer of to-day does not do any extra work without it is actually necessary to keep the thing going. If two or three days of rain happens along, he will make his appearance at the yard long enough to haul down his fires and let them brighten up, then shove them back and go home. He is supposed to have steam at sunrise, and generally is at the engine house at 2 p. m. each day, and has the bank pumped out by the time the pits are out at 10 a. m., then cleans up and goes home. Some will blow the whistle at noon and for the men to go to work at a quarter of one. The man who does as little as he can gets as much credit as the one who keeps all things in good shape. With some engineers, it is a case of give an inch, take a fathom. On one of our yards a few years ago a well-recommended man was in charge, and, without question, he was competent in all respects. There was a spell of wet weather, and the engine was not turned in a week. The engineer came to the yard each day and attended to his fires and then went home, that and nothing more for a week. The first clear day that they molded he reported something wrong with the pump, and said it would have to be sent to New York for repairs. The pump had not worked well for sometime. It was the straw that broke the camel's back, the superintendent told him that the week before he had done nothing, and, knowing that the pump was not in order, should have attended to it then, as that was what he was paid for, and proceeded to read the riot act in a manner that had a good effect and was not soon forgotten.

A change is being made in some yards in the way of getting the clay from the pit to the tub. The elevating of the clay belt will take the place of the man with a shovelful of clay stepping across the pit, and will certainly cause a more even tubfull of mud, and the cry from the molder to keep that tub full will cease, as it will require less steps than under the old way. The pit shoveler's place is one hard to fill, either in sod or tempered pit. The sod pit is not the kind for hard, stubborn clay, as it requires a good soaking, and then does not thoroughly temper, and when the top stuff is not taken all off of the sand, so that it is clear, the knives get clogged, and trouble is at once apparent by the molds not filling out. In this section, only two yards have that class of pits. Others were built, but only run a year or so, when they went to the expense of erecting tempering wheels.

CLAY FROM RIVER.

About five years ago I mentioned the fact that when the clay banks of Haverstraw failed there was a wealth of that material under water, from which they could draw. That time has now arrived, and the coming season will see at least one yard using sand from another point on the river, and the clay out of the river, covered by a water grant. In the early eighties, at the lower part of the town, a large coffer dam was built and clay taken from the land side. A few years later the Croton yards were built outside of the New York Central & Hudson tracks, and clay taken from the river, an abundance of sand on the land side being available for use. The present plans will not limit the use to an inclosed dam, but there will a trestle running from the pits to whatever point in the river they may wish to dredge the clay. The clay will be dumped in the cars and from cars to the pits. The expense may be a few cents more per thousand, but it will reduce in some lines, as in the use of horses. On the same yard, when the clay was close to the pits, one horse filled it; when farther removed two was the number required. At present the sand will be brought by boat; one horse will sand two pits, as the distance to draw will be short, so that in that line the cost will be reduced.

THE TRUST

That was being formed by men not connected with the trade, of which it was the talk last year that they had some options on Hudson river property, and the present year would see the long-looked-for, but not-expected, formation. Early in March the brick world was startled to see in the New York papers the formation of a company to control the brick trade, and make the manufacturers stop ruining themselves by overproduction. The proposition is, that as the output of the Hudson river yards is about 800,000,000 per year, if 60 or 70 per cent. of that production will agree to let us sell them at the usual commission (12½ per cent. per thousand) we are ready to take hold. Each one who agrees to let them sell their stock must not make over a given quantity, and, if they do pay them so much for them, but below the going rate. No doubt the brain that evolved that plan was tired when it reached the final point. It is in line to whip brickmaker and buyer at the same time. There would be no expense in buying, but make them send them in as I want them. Keep off the market, to the buyer; if you do not buy of us you cannot have any stock when you may require it. And the end is not yet.

THE PRESENT MARKET

Has all the stock it requires, from South Jersey to Albany, to pick from, and no cry of shortage of stock in sight, only about sixty or more million under the sheds the last year, or 220,000,000 1898, 280,000,000 1899, with preparations to make brick going on. The expected $7.00 rate was not reached, but in two weeks time over a dollar per thousand less on some. It was a scramble as to who could get the most in. One yard in Haverstraw shipped over half a million in one week. There will, no doubt, be a gradual drop. $5.75 and $6.25 rule at present, what a week may do is a question.

Hackensack, N. J. A. N. OLDTIMER.

PHILADELPHIA BRICK MACHINERY TO "OUR NEW POSSESSIONS."

Editor Clay-Worker:

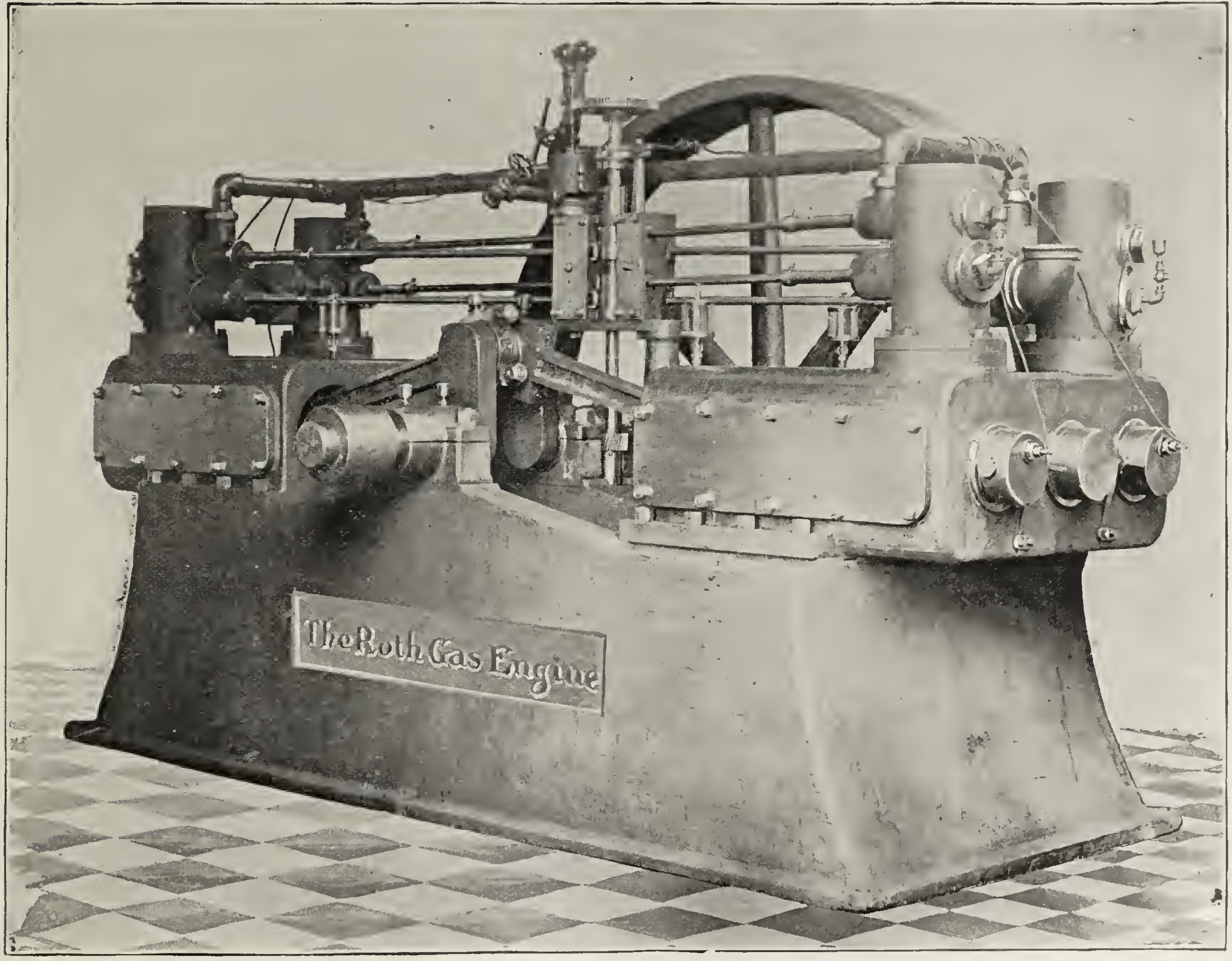
We will this month make shipment of quite a complete plant of brick machinery to Porto Rico, for the manufacture of building and hollow brick. It is of over 40,000 per day capacity, and is for a company of Philadelphia capitalists that has already obtained some valuable franchises in the city of Ponce. Mr. Frank B. McAvoy, of this city, has been very active in organizing the company, and, under his experienced and capable management, the brick end of it may be confidently expected to move in the right direction.

We naturally feel very much gratified that he has intrusted the entire machinery equipment for this plant to us, stipulating only that the brick machine must have about three times the usual length of separating and delivery belt, to give the native "off-bearers" room, as he expresses it, "to chase the brick a little." Yours very truly,

Chambers Brothers Company,
J. H. Chambers, General Manager.
Philadelphia, March 20, 1899.

GAS ENGINES FOR BRICK AND TILE FACTORIES.

We herewith present a cut of an improved gas or gasoline engine. As will be seen, this consists of four cylinders. It differs from all other engines now on the market, in that the four cylinders insure a perfectly steady motion, which is not possible in the single cylinder types. Another advantage this form of engine has is that it is possible to build them and have them run successfully in large power, the manufacturers having several 150 horse-power engines in successful operation.



A Gas Engine for Brick Factories, Manufactured by C. & A. Potts & Co., Indianapolis.

These engines are especially adapted to brickyard use. They can be operated for 60 per cent. less than steam, all expense and danger of boilers and their care being done away with.

The manufacturers, C. & A. Potts & Co., Indianapolis, Ind., manufacturers of the well-known Potts clayworking machinery, will be pleased to give further information regarding this engine. They still continue the manufacture of their well-known clayworking machinery, and have so enlarged their shops that the engine business does not interfere with the prompt delivery of clayworking machinery.

TERRA COTTA.*

SOME TIME AGO, about two months, I promised your registrar to speak on "Terra Cotta." I know of no easier way to pay a debt than with the words "I promise;" indeed, there is some fatality in the words "two months" and "I promised;" it is one of those things wherein the center drops out and the two ends come together with a bang. Had term been a year I might have found it convenient to be out of the country, but the fatal two months, I am here, and shall try and fulfill the "I promise," possibly taxing your patience at the same time.

"Terra Cotta"—it is a very large subject—anything, from a doll from Tokay to a glass retort on the Ohio, and I fear a much abused term. It includes everything made of baked clay, all, indeed, with the exception of bricks, which are always just bricks. Everything else in the category comes under the head of "Terra Cotta."

Terra cotta is a mixture of clay and brains. The manufacturer supplies the clay, the architect the brains.

Should I try to give you a history of terra cotta I should be attempting to do something which you have probably a more intimate knowledge of than I have, but I should start with the good book, at a chapter and verse, "Take you, son of man, a tile," and end up at the fourth story of a building in Toronto, where they refer to the tile, and which every word "tile" is a much hackneyed, for there is roofing tile, drain tile, glazed tile, enameled tile, etc., etc. Indeed, all pieces, from 2⅜ inches to 15 inches square, have been known to the trader under the name of "tile," which only ceases to exist when the magnitude is over 15 inches square, then becoming a panel.

It not being my intention to give you a history of terra cotta, I shall, however, endeavor, with my limited ability, taken from a practical standpoint, to give you something that may possibly enlighten you on the practicable utility of this material, for I may feel that the knowledge gained by some fifteen years' experience may be of some little service to you.

The question has probably occured to you, and naturally, "Why is it that in Canada we have not first-class terra cotta works?" Gentlemen, the answer is with yourselves. Except in a few individual cases, you do not ask for it, possibly you are prejudiced against it, and desire to remain so. It may be that you are not conversant with its utility, its virtues and its beauty, and have been either too busy or too indifferent to look into the matter with that degree of interest and study the subject demands, while in the United States numerous buildings, some of them twenty stories high, have been constructed of this material. As yet you have failed to put it into anything like general use in this country.

Again, you may say, "Why does not some responsible firm in this country cater to the terra cotta trade, with artistic work and good material?" the answer is as before. You have not made the demand on them, and have offered but little inducement or encouragement for the expenditure of the necessary money with which good works are established, wherewith they could place themselves in a position to meet the requirements of the trade did such requirement exist."

Why did the company, with whom I have had the honor to be connected for some time, expend large sums of money in the erecting and perfecting of works for the manufacture of Portland cement, a cement which is acknowledged to be equal to the best and second to none? For the simple reason, gentlemen that you, as professional men, demanded a first-class Portland cement, which could not always be had in the imported article, and having the raw material in quantities that for excellence cannot be surpassed, this company met the demand, which demand, as I said before, you are in a large measure responsible for.

The same can be applied to terra cotta. If you will create the demand there is no doubt but that some responsible firm will arise to the occasion, and will meet the demand with material that will be as good, if not better, in artistic excellence and in quality as any that can be procured in any foreign country, for in Canada we have plenty of the raw material, we have the capital, and we can soon secure the artists and workmen if we have not got them now. But you have ignored terra cotta, you have left it in the background, with a few exceptions, by attempting in your efforts misplaced economy, by erecting buildings in an old-fashioned manner and upon principles that are in the first instance cheap, and where the possibilities of combustion are apparently of but minor consideration.

I may say that I am not advertising any existing terra cotta works. I am very much like Micauber, "Waiting for something to turn up," so that my efforts to impart any knowledge or information I have acquired is not in the interest of any particular firm or company, but purely in the interest of the material, which I feel, when better understood and more cultivated, will come more generally into use, for its possibilities are practically unlimited.

Since the liquidation of my company in Toronto some years ago I have been connected with the Rathbun Company, of Deseronto, or possibly more properly speaking, of Canada, and I regret to say that during that time three of the brothers in that company have "passed beyond," and in the death of the late Mr. F. S. Rathbun terra cotta has sustained an irreparable loss, by losing one who was keenly alive to its possibilities, and who from a personal as well as business standpoint was a strong advocate for its use.

It is to be regretted that some of the gentlemen of this association have openly declared that were they erecting a building of terra cotta they would place their orders in a foreign country, forgetting, possibly, that they are dependent upon Canadians for clients, and that their utterances must of necessity cause people in this country to believe that no such material as terra cotta was being made in this country, or if so, of so poor a quality that it could not be used, and I am anxious to impress upon these gentlemen the fact that the more they do to foster Canadian enterprises and industries the better materials they will secure, and the more clients they will have, thus benefiting themselves in the end. American architects employed over here in the erection of some of our largest buildings have not so acted, for they have always used Canadian materials when such could be obtained, and it is a pleasing fact that some of our Canadian terra cotta has found its way "over the line."

Without touching upon Egyptian, Assyarian, or even Italian and Spanish of later date, the actual revival of the use of terra cotta does not extend back over fifty years much. True, in England they made chimney pots and tile as in European countries, but the English architect in the revival of classical architecture sought for a material that was at once light and durable, indestructible by fire and time, and which would not be an imitation like painted galvanized iron, of which it was once said, "Was impossible to tell from stone." This he found in terra cotta, a material of itself, with a beauty of its own, and not an imitation.

Modern building, with a skeleton constructed of steel, has been of late a great motive power for the use of terra cotta, or to put the cart in its proper place, in terra cotta has been realized the possibilities of steel construction.

In touching upon the revival of terra cotta reference must be made to England. The architecture of each country has developed its own individuality, and in England had the advantage of such men as Blashfield, Sir Henry Doulton, Sir Geo. Skey, Jennings, Gibbs, Cowan and others, and even in the hands of these men, and under the leading architects of the day, the material produced at first could not be called beautiful. The South Kensington Museum and the Albert Memorial Hall show what might be accomplished, but in no way satisfied the architects nor the artistic public. The material in the Albert Memorial Hall was manufactured out of natural raw fire clay, and submitted to open contact, with direct heat in the kiln, produced a twisted and distorted work.

Contrast this work at the Albert Memorial Hall with the gates at Lord Rosebery's mansion, made with a clay carefully washed and free from impurities, mixed with broken glass, spar and grog (you must excuse the word "grog," and not take it in the ordinary acceptation, in this instance it is a term applied to fire clay that has been burned and ground), properly dried and burned, this work could never be taken as an "imitation" of brown stone, granite or any material, and is just terra cotta.

Another instance of success in the early days is the work of the Dulwich College, carried out after the design of the late Charles Barry, and costing some $140,000.

Terra cotta received a great impetus when Sir Henry Doulton's works were erected upon the Thames embankment, in London, for the manufacture of this material and other fine art goods. The building and machinery alone represent an expenditure of £1,000,000, upon which, gentlemen, you know what 5 per cent. means. I have just received a letter from a fellow-workman at one time with me but who has returned to England to his old shop. He informs me that now there are three terra cotta works where there was only one when he left there a few

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Paper read before the Ontario Association Architects at the School of Practical Science, Toronto, by M. J. Hynes.

years ago. The English architects must have created a demand, in whose footsteps I trust the Canadian architects will follow.

You may say that delf, china, faience, etc., etc., are made at the Dolton works. True, but that is down in Staffordshire; that the Dolton works embrace the manufacture of sewer pipe and sanitary ware, certainly, but these branches are still in another block, so that the manufacture of terra cotta has no relationship to these industries at the various branches of the works mentioned.

The work in the United States has made rapid strides. Much has been accomplished, but it has had Englishmen at the head, men such as James Taylor, Joseph Joiner and other, all of whom received their practical education in England. And in the United States to-day the importation of terra cotta, delf, china, etc., is visibly decreasing. Why, because a demand having been created, the architects giving the preference to home industries, investors grappled with the problem, with the result that to-day large works are dotted all over the country, and doing a substantial, profitable business, and turning out material equal to the best that could be imported, as witness the work of the several terra cotta companies and the magnificent work at the Rookwood pottery, at Cincinnati.

Terra cotta in Canada has failed for two reasons. First and foremost, lack of support upon the part of the architects. Second, because every person who connected himself with it made brick, and making brick takes up about twenty-four hours a day, and leaves very little time for attention to terra cotta.

I fear that those in this country who try to make bricks and terra cotta, or terra cotta and bricks, will not meet with that success the venture merits, for to use the expression of the canny Scotchman, "Ye canna whustle and mawsticate oaatmeal," no doubt a vulgarism, but decidedly expressive. Still, I am open to conviction, and will make liberal concessions and exemptions to those who are prepared to erect a million dollar plant, let alone a million pounds sterling, they may do a great deal, and would probably overcome the difficulties that have heretofore existed.

In hardly two countries will the same difficulties be found, though each has sufficient of its own. A man accustomed to follow a certain line of action in one country, and with success, will often fail in another. The conditions seem to be peculiar to the country they exist in. Some time ago a Staffordshire man who had met with success in England, conceived the idea that the possibilities of money-making in Canada in the terra cotta line were exceptionally good, and a test of certain clays obtained in Canada warranted the investment, so he made it, and—failed. Then he tried imported workmen, and failed. Then imported clay, he failed again. Imported coal he thought would fill the bill, but again failure, so he concluded that to make a success of the undertaking he would have to import British atmosphere. It is needless to say he did not do this.

However, it has been practically demonstrated that Canadian clay is all right, and experiments conducted in Canada have proven that Canadian clay, if handled properly, and the conditions taken fully into account, is as good as can be procured elsewhere, and that material of just as artistic excellence and good quality can be made here as well as in any other country. This is the result of a vast expenditure of time, money and patience, but the results justify the expenditure.

The dark ages that locked up trade and family secrets (and in Europe trade secrets became often family secrets, and a business would be carried on from generation to generation, from father to son) have now become a thing of the past. Science has reached out, analyzed and brought forth work not only equal to the old, but in many respects far superior. Again let me refer you to the Rookwood pottery, which is a model of beauty and originality, and demands the praise and price of the civilized world.

There is, however, possibly, an exception in the handicraft of the decendants of the Mexican Indians, where the secrets have been preserved for hundreds of years, who can to-day hand you a water jug designed with hieroglyphics that may be designated as barbarous, having a beautiful glaze upon the exterior of a most peculiar nature which will permit of evaportion and leave the water in the jug cool and refreshing. A fine point like this has not been achieved by the modern worker.

Another exception can be made in the Japanese ware, which leaves so much to admire, to study, to imitate and to learn.

You may think, gentlemen, that I am getting away from the subject; that this is not terra cotta, yet, under the head of majolican ware, which embraces all baked clay that has received a color and a glaze, and not porcelain or china, all of this is very much terra cotta.

Nature has in this country been particularly generous in its gifts of the various substances that go to make up the component parts of terra cotta. There is a wild rush and a stampede for the gold of British Columbia and the Klondike, and those who don't rush are speculating in stocks, but the time will come, and that ere long, when attention will be paid to the gold which we have at our very doors, and which can be obtained by the utilization of the raw products which at present are spurned and considered as worthless. A well-informed person who has practical knowledge of such matters told me recently that within two hundred miles of Toronto large deposits of kaolin are to be found; that in the same section there are large deposits of spar and stone equal to the best Cornish that can be had, while as to clay, the supply is unlimited.

At the revival terra cotta was made of fire clay. The modern product is made of about four parts of clay to one of "grog" (fire clay), and, like Colonel Seller's eye water, is often one ingredient short.

Clay good for terra cotta is not taken from the surface, which usually contains much foreign matter, and owing to these foreign matters melts at a very low temperature. A pure, good clay should be mined like other precious metals, and I am convinced that a judicious mixing of different clays has produced the best results, for all that is desirable is seldom found in one bank. A good clay should not shrink much in drying.

Ruskin has compared the perfection of form to the swan, and the perfection of color to the humming bird. Terra cotta takes the form you impress upon the clay, and architects who visit the works to inspect the models made from their details are prone to say that the work never looks so well as when in the natural soft, wet clay, and for this reason the manufacturers have been striving to make the finished material have as far as possible the appearance of the soft, wet clay, and the clay model the appearance the material will have in the finished state.

Upon the architect depends the finished material. If his conception is good, and the artist follows that conception to the satisfaction of the architect, then the finished material becomes a work of art, but if the conception is bad, and the architect will not permit the artist to improve upon it, and the very fact that the artist is a clayworker, should have some little weight. The finished material is anything but a work of art, and the manufacturer, seldom the architect, is scoffed at, and the impression goes abroad that he cannot produce good work, most unjust treatment.

But the architect is often placed at much disadvantage, for the model he is asked to accept may be of a reddish clay upon a white plaster background, and the finished material to be of a cream buff color. Really it would seem that for the time the architect should be color blind, and simply look for "perfection of form, but not of color."

In the matter of color much may be said. One man will require this shade of buff, the next a peculiar shade of mahogany, another a shade of gray, with a "light sky blue feeling,' and are each much disappointed if they do not get just the particular shade they think they want, and which, if produced and erected in a building, would cause the architect to "take a trip abroad" until kindly time and the weather had softened the tones and shaded the surface of the structure.

What Mr. Waterhouse, the eminent architect, has said on terra cotta I am thoroughly in accord with; that is, to make it in small pieces. That large lintels, large columns of enormous proportions, are successfully manufactured, but it is with a great deal of care, a great deal of time, and a great deal of expense, while the virtue of the material is relative in small pieces.

Waterhouse contends that the slightest settlement of a building will cause the large lintels, large sills and large transoms to crack, while if made and constructed in small pieces that the mere settlement would be the opening of the mortar joints.

I have always found the tendency on the part of the architects here to conform as much as possible to their ideas of stone construction, and that I have made successfully pieces containing 13 and 14 cubic feet I still contend that such construction was an error.

The late Mr. Joseph Joiner, of Indianapolis, puts the maximum at 7 cubic feet, but I feel that there is still a limit in what way 7 feet may be extended.

I will hand to your registrar my idea of a specification, also what I consider tenders should be based on. I will further hand you a list of some information as manufacturers require to know to tender practically on terra cotta.

I leave this matter with your registrar. It may be possible that some of you will find occasion to refer to it in future, as I have found that specifications for terra cotta work have not been as thorough as used in general for carpenter and plumber.

Terra cotta in all colors is at your disposal. All American terra cotta companies advertise terra cotta in all colors, in glazed and semi-glazed, while an English firm came out with an ad., some years ago—"A new building after every shower."

Glazed terra cotta, so far, has not met with much success, but I feel that it could be introduced in some particular place judiciously.

Sir Henry Doulton said that a new terra cotta job never looks well. It had to be seasoned with soot.

We have some few samples of different terra cotta in Toronto. There are some Italian, some English, some American and some Canadian. The Italian gives a good illustration of embellishing architecture with sculptory in the Oak Hall, but the Italian terra cotta was not sufficiently burnt for this climate. The winter has caused some of those graces to drop an arm or a limb, which are now glued on with cement.

The obelisk laid in the sand of Egypt for centuries, but it started to disintegrate as soon as erected in Central Park, New York. This shows the necessity of well-burnt terra cotta for this climate. All the Canadian terra cotta is standing as fresh as the day it was put up.

We are constantly brought into opposition with stone. I might ask you to overlook some of the buildings erected in that perishable material. The balustrades that surround Osgoode Hall have entirely disappeared, while many of our finest buildings are showing the marks of disintegration. In a well-burnt piece of terra cotta you have something that is indestructible, being proof from fire and time.

A REMARKABLE RED CLAY.

By S. Geysbeek.

NATURE FURNISHES us with all kinds of clays in different quantities, qualities, etc. Some are purer than others, while some are sandy and coarse grain, others are fine in texture. Some clays are more plastic than others, and some differ very much in composition. Analyses of clays make us acquainted with the many and various ingredients which they contain, and enable us to compare intelligently their different qualities, rate their merits and ascertain the best possible results to be obtained. Rational analyses of clays divide the product into clay substance, feldspar, flint and sometimes lime.

We have of late experimented considerably with red clays, and find that the iron plays a very important part in clays and glaze mixtures. In ordinary drift and alluvial clays, iron will act as a flux to such an extent that this kind of clay can resist but a moderate low heat. Common building brick clays and flower-pot clays do not require more than a cone .08 heat to give them their right color and hardness. Above this temperature they will fuse and become worthless for other purposes. In shale clays and in some impure fire clays the iron does not act quite as powerful a flux, and articles made from such clays, or mixtures of the same, will stand a heat as high as cone 1, but, when burnt to a higher temperature, their red color will change to a dark brown, dark, dirty red brown, and sometimes even greenish and black.

Common red burning clays mixed in proper proportions with flint, kaolin and feldspar give at a certain temperature a bright red color. When burned above cone 4 the color will change to dark brown in nearly every instance.

I have made extensive experiments by introducing iron in its different forms to clays and glaze mixtures so as to obtain the desired bright red color, but without any success. I also used the best red burning clays obtainable, but without any more success. However, in one instance, I found a clay which has all the necessary requirements and qualities, and to which I will call your attention.

After many unsuccessful trials with clays from different parties and mines, I at last obtained a sample of red clay which has proven to be the very best and most remarkable clay I have ever heard of or worked with.

In my researches for a desirable clay I was assisted by Messrs. Paul Uhlich & Co., 108 Fulton street, New York, and obtained from them several hundred pounds of this red clay.

This "Eagle brand" of red clay, which so thoroughly answers all requirements, contains 10 per cent. of iron, is very plastic, molds very good, and in its composition (the iron not taken into consideration) is nearly as pure as kaolin. The percentage or iron found in this clay is the very highest I have noted so far. It dries very regular, burns to a very bright red color at low heat, cone .06, and somewhat darker red at higher heat, cone 8. It vitrifies at cone 6, and shows a very dense structure. For comparison I herewith give the chemical and rational analysis of this clay:

—Chemical Analysis.—

Silica	48.95
Alumina	28.95
Iron	10.18
Lime	0.94
Magnesia	0.26
Alkalies	0.96
Comb. Water	10.30
	100.54

—Rational Analysis.—

Clay Substance	82.34
Feldspar	5.27
Quartz	12.93
	100.54

For further Information, and to show the excellency of this clay, I give the following formulas:

Will burn to a bright red color between cones 6 and 8, and gives a good vitrified body by mixing:

Eagle Brand Red Clay	600 parts
Flint	375 parts
Feldspar	25 parts

For lower temperature, the following composition will give excellent results:

Eagle Brand Red Clay	850 parts
Flint	150 parts

For making red glazes, linings or engobes for terra cotta, mosaic tiles, roofing tiles, face bricks, enamel bricks, majolica ware and other products in the clay line, this clay has proven to be the very best yet produced, and the results are most satisfactory in every respect. The much-wanted bright-red color is easily obtainable with this Eagle brand, and will stand all temperatures without any great change.

This Eagle brand red clay will help to fill out a long-felt want in the ceramic industry, and through its superior merits will overcome the many obstacles due to the lack of proper raw materials.

LIFE AND ITS MEANING.

ANOTHER WINTER has nearly gone, and there is something inspiring in the new life of budding spring. Another season is close at hand, and the brick manufacturers are beginning to fit up for another year's work. It will not be many days now until the wheels will again be in motion, and another crop of brick will be on the way—common brick and pressed brick alike. It is always a pleasure to the onlooker to see the clay or shale dumped in the dry pan and crushed under its massive rolls, then elevated to the screen and returned to the dry press, then pressed into beautiful shaped brick and taken to the dryers, and then to the kiln to be burned. They are then sold to get the golden brick, and sometimes to get something that is a good deal easier to get than the golden brick.

I hope the coming season will be a prosperous one to all. Let us ever be reminded of the Supreme Architect to guide and direct us, that we may not let the garden become so clustered with blossoms as to keep the daylight from sifting in. He sometimes cuts a swath through the midst of the garden that we may again be reminded that there is a sky above as well as clay beneath us, and that down upon some of the verdure that remains rifts may be open through which the heavenly light shall touch and play. Am I mistaken in thinking that there are some garden plots right in our midst that have grown so rich and rank that the very verdure has come to interfere and hide between the tenants of the garden and the lord of the garden. Our lives are the most valuable factors and most important elements in the world. It is universal in its claims and needs, and yet, upon every hand and at every door, it is disregarded more than any other thing. Nature is so reparative that we look to her, confidently believing that she will let us do violence to His divine law and escape the penalty. Life is full of a variety of lessons, and, if wisely observed and truthfully lived up to in our highest convictions, it becomes a constant blessing, and we are prepared for the journey through this world and fitted to enjoy an eternal life, no matter in what sphere it is to be lived. Then we have learned the greatest lesson that can be taught. G. O. WRIGHT.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

A Correction.

Editor CLAY-WORKER:

We notice in an article written by Mr. Willard Beehan, under the head of "Brick Pavements in Western New York," that he states the brick used in Binghamton, N. Y., in 1892, from Henry to Lewis streets, were furnished by the Preston Brick Company, of Hornellsville, N. Y. This is an error, as they were furnished by our predecessors, namely, Corning Brick and Terra Cotta Company, and they were the first paving brick manufactured in Corning.

BRICK, TERRA COTTA AND SUPPLY CO.

CORNING, N. Y.

The New York Fires—Their Lessons.

Editor CLAY-WORKER:

I do not believe that Mr. and Mrs. Andrews, who were burned to death in their home on Fifth avenue in New York, carried gold-cased watches with Waterbury movements. They lived in that kind of a house—brick and stone on the exterior, kindling wood construction on the interior—and yet we hear it said that this building was supposed to be fireproof. The New York Herald said it was supposed to be fireproof. The World and the Journal said the same thing. One who does not know facts can suppose anything. No one who knows anything about construction ever thought for an instant that this house or the other one which was destroyed so quickly were fireproof. These houses were constructed and furnished in as inflammable a manner as it is possible for human ingenuity to devise. The exterior in both instances compares to the gold case of the watch. But the case does not keep time, nor will the best constructed exterior protect the worst constructed interior. What does it matter if a brick, stone, granite or terra cotta front be made, if on the interior there be joists set on edge, studding with empty spaces between, light flooring, inflammable open ways from top to bottom, curtains in the windows three or four deep, lambrequins, strings and sticks in all the openings, three or four thicknesses of carpet lining? What better combination for conflagration? Is it possible to devise anything more inflammable? In the case of the Windsor Hotel—that wooden interior with a substantial shell—there is talk of a fire having been kindled in different parts of the building at the same time—incendiarism. Incendiarism! Rats! A match under a table cover, thrown against a curtain carelessly or into an upholstered chair, or something like that, would start a fire that would go all over the Windsor Hotel exactly as it did go—through the hollow spaces between the wooden joists, between the studding, helped by the wooden lath, the carpets, the paper lining, the beds. How could one arrange a given amount of inflammable material, confined within walls of stone and brick, to more rapidly and easily, to more certainly destroy the same number of people than by this means? Of course, no one expects that the furnishing of a house will be limited by the fire hazard, but it is possible to so construct these buildings that a fire started in a sofa pillow or window curtain will not trap a whole family.

I remember to have seen a fire in the lower story of an apartment house, the room filled with inflammable material, the occupants of the floors above not thinking it worth their while to move out. That was fireproof construction, and the people knew it. We lived in an apartment house in Paris wherein we would have felt perfectly safe with a fire above, below or on either side of us. It was a confidence born of good construction. There are many such structures in this country in our cities, but the very large majority are typified by the Andrews house and the Windsor Hotel. Chicago, Boston and Philadelphia are largely made up of these pretentious, showy, well-constructed exteriors filled with inflammable interiors. Every time one of them goes up in a puff there is that ignorant howl about fireproof construction. One can call any building fireproof, if he is ignorant or wants to lie about it. If a man has a house that he wants to sell he can get more money out of it if he can make the other fellow think that it is fireprooof. The contractor can build a row of houses and scatter a little fireproofing around through them, paint a big, cheap sign on the outside calling the attention of the public to the fireproof structure and get a better price for them than if he were to tell the truth.

It is said that the Andrews house was rated as fireproof by the insurance companies. What does the average insurance inspector know about fireproof construction? Do the insurance companies inspect buildings while they are going up? They make rates on them after they are finished. One can tell if a building is fireproof by tearing it to pieces, but insurance inspectors do not do that. They walk around a building, keep their mouths shut to conceal what they don't know, go to the office and make a rate, and then the owner goes there and kicks because it is too high. If the facts were known, they are generally not high enough. If they were to make the rate higher we might have better buildings.

Fires of the kind mentioned are no surprise to anyone who has given these matters any consideration. The surprise is that there are not more of them. The number killed is no surprise. The surprise is that so many get out. The Windsor crematory did not let many of them get out, but even the number saved is a surprise, when we know the structural facts.

LOUIS H. GIBSON.

Burning Brick.

Editor CLAY-WORKER:

I received a letter from one of your subscribers saying: "I am working a bank of clay between a red and yellowish color, with layers of fine sand every two or three inches apart. It burns a bright red color, and will ring like iron when struck. Even the salmon-colored ones have a good ring. There is a great waste in burning—12 or 15 per cent. The arch brick, particularly the ones nearest the mouth, are all broken, and, as we burn with the old-fashioned 'clamp' kilns, with about two thousand in the arch, for every twenty thousand we burn the loss is considerable. I have mixed both sand and loam with the clay without any better results. They do not stand the fire any better, nor do they have as good a color or as good a ring. The trouble seems to be that the clay will not stand the fire a second time. The best brick, when put on for scoving or platting, are no good when taken off; or, if a spot gets too much fire and is burned black, they are easily broken. Brick molded 9⅛ inches long will shrink about 1⅛ inches when burned. Would it pay me to put in a patent kiln for burning from one milion to one million and a half in a season? I would also like to know if you have ever heard of wire-cut brick standing the fire better in the arches than sand-molded machine brick." I also notice letters in your correspondence columns from Carter & Rollins and L. W. C. The trouble of all three can be traced to one prime cause, and that is, imperfection in burning apparatus. Setting has also "a lot to do with" the result; but in a poor and inefficient kiln, one with poor combustion of fuel and little, if any, protection against air currents and consequent chills, where the heat cannot be steadily maintained until its mission be successfully accomplished, and where expansion and contraction of the ware is continually and alternately taking place. No matter how carefully the setting is attended to, the burn will be a failure. The measure of satisfaction varies as the standard of the person to be satisfied. A good burn to one would be a dead failure to another, each according to his light. I say this merely to qualify my assertion that the burn would be a failure. In my travels over the country I have seen kilns that satisfied (?) the owner (at least he said so), but which I am confident would have caused the discharge of the man in charge of many plants. I have often wondered why men (owners especially) will, after being so particular in the selection of their power and brickmaking machinery, be so careless in this matter of kilns. "Any old thing" seems good enough to burn in until they, either by dropping onto the Clay-Worker, wandering into one of the sessions of the annual conventions, or by rambling over to some more progressive neighboring plant, are suddenly enlightened to the possibilities of the business. The requirements of architects and builders to-day are entirely different from those of years ago. This is partly the result of the action of brickmakers themselves, and partly the result of extended education in the use of building materials, but, however it has come, it must be met by the brickmaker, and to do this he must avail himself of the most approved and improved apparatus on the market. It is to his financial interest to do this. The raising of the standard has not, by any means, been followed by a corresponding raise in price. Brick machines and kiln men have appreciated this fact, and worked on it. To meet the new conditions machinery and kilns had to be increased in efficiency and every possible economical movement taken advantage of, each one striving to outdo his competitor in this respect, to the advantage of the brickmaker. A life belt will not save a drowning man unless he seizes it and holds on to it. The point of making sure of having a properly constructed kiln is the base of the remedy for the ills as described by your correspondents.

There are some clays that will successfully withstand the hardships of a score kiln arch, but they are few, and even under the most favorable conditions they are not economical either in fuel or percentage of good hard brick. To close the matter, I would strongly advise the parties to look at some of the kilns advertised in your valuable journal, and believe by the adoption of one of these they will overcome their "burning" trouble.

Mixing sand with clay has the property of reducing its plasticity, and if it is good sand will make it more refractory and help it to stand sudden heating and cooling better than if without it, so as the sand mixed in by your correspondent does not do this I conclude it is not a good sand, but merely a loam, and would advise him to try better sand, cleaner and sharper.

His question, "Have you ever heard of wire cut bricks standing the fire better than sand molded machine bricks?" must be answered in the negative, but they will generally stand more fire than the sand molded, and where both kinds are set in the same kiln I would set the wire cut in the arches and immediately above, and the sand molded in the upper portion of the kiln.

Replying to L. W. C., I would advise him to put in a tunnel dryer. It is more economical and less trouble and bother, and not much more expensive than sheds to erect, and has the advantage that the conditions can be made to suit the material under treatment.

OLD BURNER.

A Good Hand Yard in Alabama.

Editor Clay-Worker:

Our brick plant is at the edge of town, and very near the river, therefore we call it the Riverside brickyard. We make all of our brick by hand, and we have turned out as many as 30,000 per day, but it depends on what number of molders we put on. We make only the rough building brick at present, but we have a good bank of clay, which we think would work well in a machine. Will you do us a favor by giving us the address of the makers of the Sword machine?

We have three grades of sand within fifty feet of our yard, and an abundance of good clay. Most of the clay burns a cherry red, and I think it would make a good machine brick. We have been making brick for four years, and so far cannot complain, as we do our share of business, though we sell at kiln for $4 to $5 per thousand. We are in the business, and intend to stay.

We use wood in burning, and we have just bought 1,100 acres of the finest timber land in this country. We intend to cut all the wood and then have the land worked, which will grow most anything planted. We are not farmers, but bricklayers and makers, but we like to see the good work go on. We have about fifty men cutting wood now. By spring it will be ready to haul. We generally start the yard going in April.

As to The Clay-Worker, we think it as good a book for a clayworker as can be found anywhere. Inclosed herewith please find $2 for our subscription for the coming year.

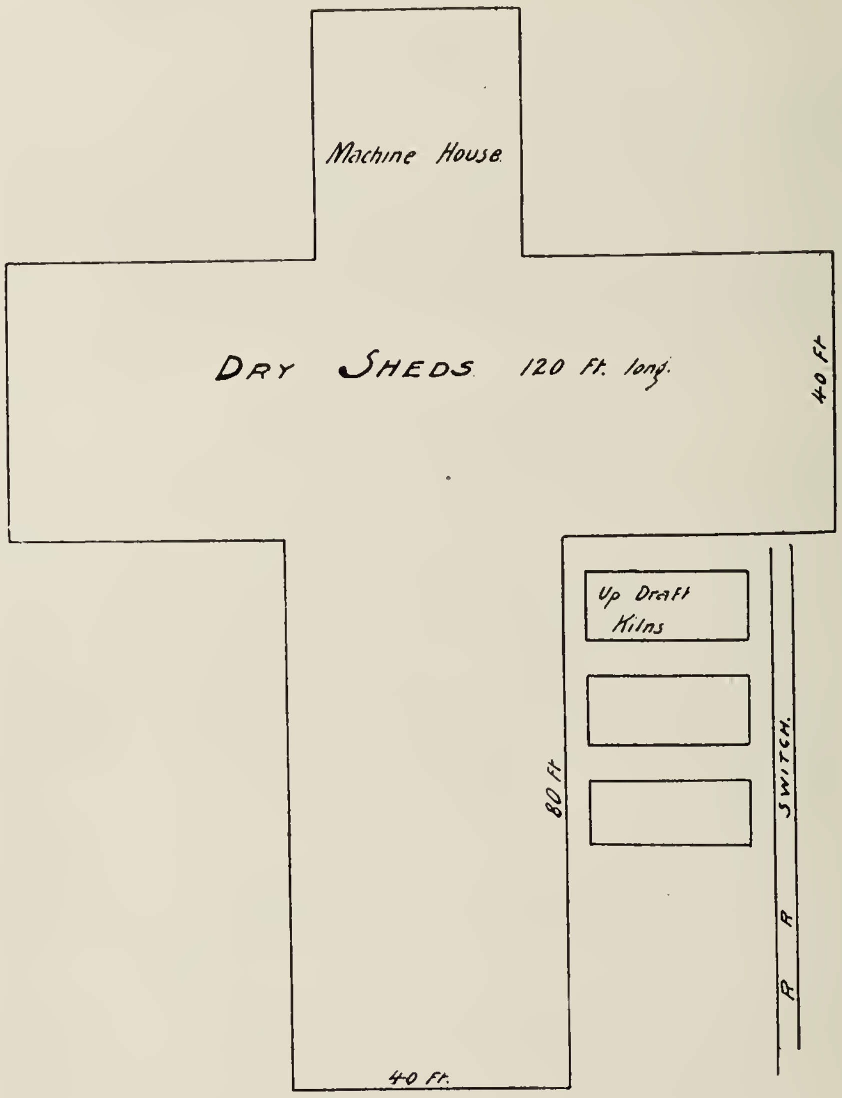
McGrath Bros.

Construction of Dry Sheds—How to Prevent Cracking.

Editor Clay-Worker:

In the March number of the Clay-Worker "L. W. C." states his troubles, and asks for assistance. In attempting to answer his questions I shall take them in the order in which they are propounded.

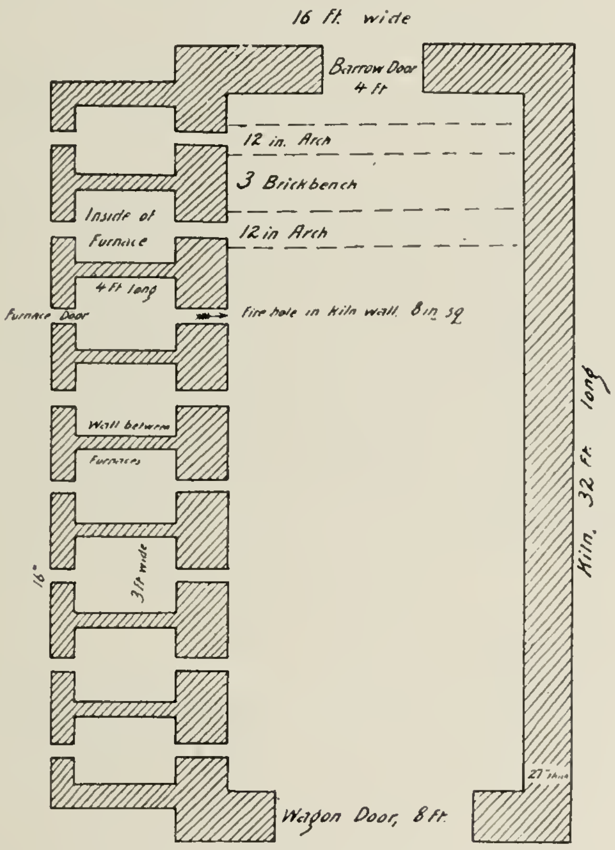
First—How wide shall dry sheds for bricks be built? That depends entirely on whether the clay is extremely tender and liable to check from exposure to sun and wind. If the clay will not stand rapid drying, make the sheds wide and provide doors for the sides to close during the early period of drying. I send you a rough drawing of our own sheds for drying our bricks, which are very sensitive to every breeze when first made. These sheds are 6½ feet high at the eaves, and about 10 feet high in the center. They are made on a very cheap plan. White oak posts are set in the ground in rows to make a support for the roof. This roof may be made of shingles, roofing or boards. Make a roof that will not leak under any circumstances. Generally the roofs over the brickyards one sees in different localities are a disgrace to the craft. In these sheds we hack our brick direct from the machine in rows nine bricks high. This hacking mars the face considerably, but they are all right for common bricks. For face bricks we place them on pallets in racks. Our sheds have two sets of doors around the sides to exclude the wind. One set has hinges



at the top, and opens upward. The others are narrow doors, opening downward. Thus we can admit more or less draft as the clay will bear it. After a few days the bricks seem to get set, so that we can open wide all doors, and the harder the wind blows the better for our purpose. If the clay will bear rapid drying the sheds would better be made narrow and long, with passages between for barrows. Then the swinging doors would be necessary only to exclude rains.

Second—I send you a plan of our up-draft kilns, 16 feet wide inside of walls, and they may be made any length to suit ones convenience. The drawing shows the furnaces on one side only, but, of course, they would have to be duplicated on the other side. The kiln walls should be built high enough to set the bricks at least 35 high. The outside furnaces are each 3 feet wide and 4 feet long. Each has grates and an ash pit below. The arch over each furnace is about 18 inches clear over the grates, thus making a good roomy furnace. The hole in the kiln wall which makes a passage for the heat from the furnace into the arches we make about 8 inches above the grates. We make these holes only 8 inches square for the reason that we have found that this size is large enough, and also it effectually excludes all cold air and prevents the checking and breaking so commonly seen in arch bricks. With large holes our arch bricks go all to pieces. With small holes they are perfect unless we make the mistake so common in up-draft kilns of overheating the arches.

This seems to be the third trouble of "L. W. C." He should learn to judge by the appearance of the heat in the arches when the bricks are near the danger point, and never under any circumstances go beyond that point. A careful burner can raise the heat almost to the limit, and hold it there with very little variation between fires. But unless one knows well his business he would better let the arches cool down just a little before renewing the fires as a matter of precaution. This is not a good plan in itself, but it is better than melted arches. I think the plan of furnaces recommended will prevent cracked and broken arch brick for "L. W. C.," as they have proven all right with our clay, and I have never seen a harder material to handle than the clay from our bank. It cracks from start to finish if it gets any possible chance to do so. L. C. M.



The Best Seven-Year-Old Pavement in New York.

Editor Clay-Worker:

In your October issue of Clay-Worker the writer saw the article written for the Clay-Worker headed "Paving Brick in New York City," in which it states that a brick pavement was laid upon Ninth avenue and near Fourteenth street. I was in New York city last week and on the 8th inst. took a run out to this spot on Ninth avenue paved with brick and was more than pleased with its present condition. When one stops to consider the immense amount of traffic, going and coming, and heavy at that, over this pavement it is to say the least simply wonderful to note how well it stands it. I can truthfully testify to the fact that it's the best seven-year-old pavement in New York city to-day. Will you please let me know whose brick was used in it. I wish every paving brickmaker in the United States could see it. It covers one block on Ninth avenue near Fourteenth street. Very truly, O. PRESTON.

The Chicago Outlook.

Editor CLAY-WORKER:

The idea of newsgathering on so prosaic a subject as burned clay, the day after an exciting city election in what is deemed one of the most excitable of American cities—consequent, no doubt, upon the ozone-ladened airs of lake Michigan, mixed in equal parts with the fresh breezes of the broad prairie region flanking the city on the southwest—and the making up a report for your readers of the situation here, as it concerns the brick outlook, that should not be colored more or less with the result of yesterday's doings at the ballot box, would seem somewhat preposterous to one who did not expect that the brick-making denizens of the Chamber of Commerce would be open for business at the old stand at the usual hour, and as level-headed as ever.

In calling upon that friend of all good clayworkers, D. V. Purington, we found him receiving the congratulations (?) of his friends and opponents of the day before, not at all ruffled in that his candidate had been shelved, no doubt consoling himself that but for the name of being beaten the results were not so bad after all, since the election of Harrison was but an indorsement given by business men and good citizens of all parties to a man who had stood manfully for the people against rings and corruptionists during the past year of his administration, and who was pledged to carry out the reforms demanded by the best citizens for the year to come. Leaving politics, there was but one opinion expressed as to the prospects for brick the present year. "Thirty-three per cent. better demand than last year," will sum up the situation so far as it relates to the use of common brick. Only about 300,000,000 brick were demanded in 1898, while it is believed 400,000,000 will be needed in 1899, of which, perhaps, 60,000,000 are now on hand.

Such an expectation cannot be regarded as very optimistic, since the productive capacity of Chicago's forty-four yards is about one million brick per annum. Of these yards hardly more than twenty will be likely to make brick this year. The increased demand will come largely from additions to, and new erections for industrial buildings. The McCormick Reaper Co. will alone use 4,000,000 brick in adding to its already mammoth plant, and agricultural men generally are following suit.

As to prices, they are what may be called good for Chicago. Kiln run brick bringing $5.75 to $6.00 per thousand delivered, which is an advance of perhaps 25c over prices prevailing in 1898, and it is believed prices wll be maintained.

The new postoffice and government building, which is beginning to show a portion of its steel frame above the high barricade surrounding the square, will call for about ten million brick before its completion, but the delivery will stretch through the next three years.

Of course, many hundred thousand feet of clay fireproofing material will be also demanded in completing this mammoth structure, which will bring cheer to another branch of the great family of clayworkers.

We notice that the Pioneer Fireprofing Co. has been encouraged by the outlook to replace the factory burned some two years ago at Ottawa with a handsome modern plant, which Manager Holland rightly thinks stands near the head of the procession in all that makes up an establishment for turning out a maximum quantity of first-class wares in their line at a minimum cost. Abundant water power, a variety of clays of excellent character, electric haulage of clays, and one of the most tasteful, convenient and well-equipped factories, built from hollow blocks of their own making, and equipped with machinery and dryer of the American Clayworking Machinery Co.'s build, briefly summarizes the situation. One can hardly look through their Ottawa yard and their Chicago sample room in the Marquette building without feeling that it is a shame that the very beautiful mottled effects, and the bright buffs and pinks, which appear in many of their wares, should be hidden from sight by a plaster coating. We are advised, however, that the company is contemplating the manufacture of a line of terra cotta blocks for outer wall construction as licensees under the Durant system.

The front brick situation in Chicago is deemed to be even more encouraging than the common. "Fifty per cent. better than last year at this time, and a prospect that the balance of the year may run to 100 better," was the hopeful statement of the most prominent dealers. On entering the sample rooms of the Chicago Hydraulic Pressed Brick Co. in the Chamber of Commerce Building one is almost bewildered with the variety of grades, shapes, colorings and qualities shown, telling more plainly than words can of the enormous strides made in this particular department of brick manufacture.

Beginning with red sand-molded brick at $6 per thousand, we come to red pressed at from $12 to $18; buff from $12 to $20; brown, $20 to $25; mottled fire clays, from $20 to $30. Then there are beautiful white-faced—not enameled—but water proof, to resist the grime of the city, and the story is but half told.

The only speck of trouble apparent to the vision of the front brick man is the possible clash between the machine-cut and hand-cut stone trimmings manufacturers, which can affect the brick men only as precipitating a "sympathetc" strike. But over against this may be set the welcome fact that for the first time in several years (since 1893) a class of goods, isolated residences, making demand for fine front brick, are to make a large feature in the year's business. A majority of orders taken in the past year have been for an average of 2,500 to 3,000 brick for a 25-foot front, but the fact that many business men have been making money the past year, and see good times before them, and are investing in good homes, is accepted by the pressed brick man as a sign of better times ahead, and an evidence that prosperity has come for a lengthened stay. Yours truly, E. G. D.

Setting and Burning Dry Press Brick.

Editor Clay-Worker:

I note the inquiry of Messrs. Carter & Rollins, on page 183 of the February Clay-Worker. In reply I will say that the great essential in making a uniform burn throughout the kiln is the uniform distribution of the heat. If plans can be devised and adopted whereby a sufficient amount and degree of heat can be applied to each and every part of the kiln, without overheating any part, the kiln will be well and uniformly burned.

The draft or circulation of air and gaseous products of combustion is the medium whereby heat is carried through the kiln. The draft takes the shortest and easiest course from the fire through the kiln to the chimney or top of the kiln where it escapes. If one part of the kiln is more open and offers an easier passage than others, it will take more than its share of draft and heat, and will, as we say, steal the heat that should go to other parts of the kiln. That is to say the kiln should be set so as to make the draft uniform through the different parts.

I realize that the query that our friends propound is just how this is to be done. I prefer to answer in a general way, and allow them to apply the details.

Heat is generated in the arches, and here is the greatest amount of heat of any place in the kiln. This heat should be removed from the arches as quickly as possible and carried to other parts of the kiln that do not have as much heat as they need.

Remembering that the draft is the medium whereby the heat is carried, we naturally must give good draft from the arches. That is to say, the brick in and near the arches should be set open, with many and large spaces between them. Set the brick carefully, end to end, so that the spaces leading from the fires will be continuous, thus making channels or flues leading from the arches into the kiln. This will give a ready draft from the fires, and the heat will flow quickly from the hot brick around the fires to those that are farther away and cooler.

In setting, always keep in mind the necessity of getting the heat out of the arches and into the kiln as quickly and readily as possible.

The gentlemen say that they "cannot burn out closely on heads, on account of not being able to hold the heat." I infer that they have no trouble in generating heat, but fail in its distribution.

Possibly if they would cover their kiln tighter over the center in the early part of the burning, and drive the heat into the heads first, they would succeed better. It has been said that the heat will go to the hottest part of the kiln, and, if they will make the heads the hottest parts at first, the heat will continue to go to them, and less difficulty will be met in burning them hard enough. After the heat has been driven into the heads the center may be attended to, and, if it is found to be behind, the draft and heat may be directed to that part of the kiln.

They say "Our shale shrinks so much in burning that it is hard to get an even burn." I do not understand how the shrinkage can prevent getting an even burn. If a sufficient amount of heat is properly distributed the shrinkage will be uniform in all parts of the kiln having the same heat, and, just in proportion as the heat is uniformly distributed, the brick will be uniformly burned, regardless of the shrinkage.

Those broken arch brick should be carefully examined to ascertain whether they were broken in water smoking or afterwards. If they are cracked or broken in water smoking, the broken surfaces will show discolorations, due to the influence of the fires after they have broken, and the cracks will have gaped open during the subsequent heating and shrinking of the brick. In this case they can only be saved by exercising greater care and skill in water smoking.

If the brick are checked or broken in cooling, or by the admission of cold air into the arches during the latter stages of burning and while the arch brick are very hot, the cracks may not be opened much, and maybe hardly enough to be seen, and yet the brick will be shattered more or less, and will not have the proper ring. After the arches once become hot the fire doors should be kept closed and only opened when necessary, and then closed again as quickly as possible.

Cedar Rapids, Ia. D. W. Stookey.

The Standard Size Brick.

Editor Clay-Worker:

Notice in the Clay-Worker for February, under the standard size of brick, the sizes given for pressed brick, 8⅜ by 4 by 2⅜, and for common brick, 8¼ by 4 by 2¼. It seems to me there must be a mistake in the figures, as sizes given for press brick would leave a head joint of ⅜ inch when it became necessary to use two widths over one length, as must be done sometimes.

Stay at Home asks why the report of the committee of 1897 to advance the use of brick, etc., does not appear. What was the cause? Was there no ground to cover?

Will say to him: One reason was that brick manufacturers were not interested enough to give any assistance. As of some 75 letters sent out by the writer for facts, figures, etc., there was but one brickmaker who gave anything of account to assist the committee, and but three or four who made any reply whatever. The machine and kiln men replied in every instance, and showed far more interest than the parties who should have shown most interest.

As to the ground to cover, it is a large field, and would suggest that A Reader open up the field through the Clay-Worker.

Why are not more brick used in the construction of houses of medium cost? What has the brickmaker to contend with?

First—The large majority of contractors for this class of work are carpenters, and wood construction gives them more work, consequently they recommend wood for building purposes.

Second—They make people believe that brick are very much more expensive; that a building of brick will be damp. A lady told the writer that a contractor told her that clothing could not be kept in a closet in a brick house, as the dampness would mildew it so it would be spoiled. The contractor so impressed her that they "veneered" the house, thereby knocking the brickmaker out of half his sale.

Third—When a "wooden" contractor figures a brick job and wood from the same plan he will so figure to make the brick job apparently very much more costly. A case in point: In figuring in competition with a wood man his figures between the cost of wood and veneered brick were about $100 more than the entire cost of the brick work, including the builder's profit, and on a job taking only about 20 thousand brick. He had figured about 20 per cent. more brick than were required to do the job, not allowing anything on the wood building for siding, paint or labor, making the apparent cost of brick very much above wood, when on the same basis of figuring there was not to exceed 4 per cent. in favor of wood.

Brickmakers should, in my opinion, go to parties intending to build and figure their brick for them, not taking masons' measure, but actual brick, kiln count, needed for the job, and if that won't do contract to furnish brick and put them in the wall for them, figuring their brick at market price on the ground, and a fair profit on putting them in the wall. After a few such lessons even a wooden contractor will tumble to the fact that he had better give brick an even chance at least. As to cost: The difference between wood and brick will not do the extra painting on the wood building more than twice in this section. The percentage of cost will, of course, vary in different localities, but think this proposition of cost will hold far better than three-fourths of the territory included in the United States, aside from the new expansions.

Vicksburg, Mich., March 27, 1899. J. E. CLAPP.

Setting and Burning.

Publishers CLAY-WORKER:

Please find inclosed two dollars for my subscription. I notice an article in THE CLAY-WORKER in which Carter & Rollins ask for information from some experienced writer or burner. I have had twenty years' experience in England and eleven years in America with different clays and kilns. I think their setting is all right, with the exception of the heads; I should say two upon two all around the heads, which will cause more draft, then watersmoke carefully. When raising fire keep cold air out as much as possible. When the fire is perfectly clear on the top and is leaving the heads and taking too much to the middle, confine it with earth in the middle, which will drive it to the edge.

If the above does not prove satisfactory, the next remedy I would recommend would be to put furnaces to the kiln, which would enable one to put smaller holes in the kiln, say nine inches, that would let the projecting courses come over in three instead of seven, which would cause less waste.

I was looking over Mr. Twells's article in THE CLAY-WORKER very carefully, and I think if every brick burner in this country or any other country will follow his ideas, either up-draft or down-draft will make a success of the business.

March 20, 1899. JOHN HUME.

DOWN IN JERSEY.

Editor CLAY-WORKER:

I send you herewith a few items of clay news from this neighborhood. First of interest to this town is the incorporation of the Fulper Pottery Co. with a $50,000 capital. Some of the parties now interested are of the fourth generation, as the pottery was established by Fulper in 1805, and it has been in the family ever since. One year ago they assigned, but the shop was run by one of the Fulpers and some of the employes with the consent of the receiver. Business is good with us at present.

"Uncle" Kie Pedrick, one of the oldest brickmakers in our town, died March 23, aged sixty-nine years. He had been on a brickyard from the time he was big enough to carry water or drive the horse in the old-fashioned pug mill. A good-natured old brick man, we all hope that he has gone to that place where the streets are paved with gold brick and the off-bearers cease from troubling and the kiln burners have a rest. Away back in the early fifties he began the manufacture of brick at the yards just on the northern borders of our town, and, in connection with his son, George C. Pedrick, was engaged in the manufacture of brick at the time of his demise.

Mr. J. Condit Smith, of Troy Mills, N. J., writes me that he intends to erect a brick plant on the property of Matt Moore at Whippany, N. J. I know the clay is No. 1 and plenty of it. I know that it is forty feet deep, and I think it must be sixty, for we never struck bottom. The locality is first-class, and a large market at fairly good prices—$6 to $7.50 for stock and $14 to $20 for pressed. He is sure of success. J. C. L.

FLEMINGTON, N. J.

ST. LOUIS NOTES.

Editor CLAY-WORKER:

The brickmakers of St. Louis have at last come to their senses, and have now "a little understanding" which will enable them to make brick at a profit. They have been waging a bitter war among themselves until the price of brick got to such a low point that it was a most expensive luxury to stay in the business, yet they got no thanks from the building trade for giving away their brick, nor did it stimulate building.

The fact has at last been painfully realized that, while a long purse and a strong credit may finally be able to freeze out the competition of the weaker manufacturers, this can only be done at the expense of heavy and long-continued losses, and the small yards still remain in existence, to be bought in for a song at a sheriff's sale by the next man who stands ready to again make brick at the first advance. As the sold-out yards are bought for a song, the new party starts out with an insignificant invested capital, and, therefore, is much more favorably fixed than the older plants with interest-eating debts for keen competition. The weaker men can be eliminated by selling brick below cost, but the plants remain to go into business under new, vigorous management on the first improvement in business, under the enormously greater advantage of having no debts to carry as the result of knifing competition and prolonged selling at a loss, while the investment charges are at a strict and very attractive minimum. This has at last been realized by the St. Louis brickmakers, and now they have made a satisfactory arrangement, which insures a living profit to all, yet brick are sold at a fair price or at the old prices under which most of the St. Louis building has been done, so that the new season opens up under encouraging circumstances.

The trade is quite as willing to pay a fair price, and are far better satisfied when they know that prices are stable and that their competitors have not special discounts of 50 cents per thousand in their favor.

There is some talk again of starting a white ware pottery in St. Louis of four kiln capacity, to take advantage of Missouri's possession of the raw material or good kaolins, ball clay, seggar clay and spar.

The Standard Tile Co., which manufactures roofing tile and terra cotta trimmings, have remodeled their kilns and are about to build new kilns on the new lines.

The St. Louis sewer pipe makers are paying no attention to the pipe trust, but are quietly "sawing wood" and pushing their business.

The St. Louis World's Fair, to celebrate, in 1903, the famous Louisiana purchase, is now an assured fact, and has, consequently given the building trade a most optimistic opinion for the next five years' business. For this is to be a genuine World's Fair, not a local proposition, and is to be carried forward on lines comparable with the great White City Fair of 1893, when Chicago startled the world as to the capabilities of the West in vastly eclipsing any previous effort in world's fairs, Paris not excepted with its experience of four of such fairs.

"LOUIS."

An Opening for an Experienced Tilemaker.

Editor CLAY-WORKER:

Inclosed please find subscription to THE CLAY-WORKER. My situation is this: Have a No. 9 A Brewer brick and tile machine, best of clay, two engines, 30 horse power Buckeye and automatic, 100 horse power Bates Corliss, sawmill, etc.; 300 gallon per minute pure artesian well on grounds. A trade in brick and tile easily developed from head of Tallahatchie river to Vicksburg. No section needs tile more than the Yazoo valley. I want a man to develop my plant, with or without capital, but dependent upon successful output for part, at least, of his pay. Several have written, but are only brick men, and this is too far south. I want a skilled, patient, Northern man, skilled especially in making tile, and who knows how to build up a brick and tileyard in best modern style. I will put up the money necessary. Main labor to be had is negroes, shipment by boat, though the I. C. R. R. and Southern are within three miles east and west, but no connection with them as yet, except above and below a number of miles on river.

SHELL MOUND, Miss., April 8, 1899. OSCAR F. BLEDSOE.

THE CLAY-WORKER

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SIXTEENTH YEAR OF PUBLICATION.

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Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXXI. APRIL, 1899. No 4.

CURRENT COMMENT.

Several of our advertisers who but a few months ago were complaining of dull times and threatening to quit the business because there was nothing in it, now write that they are fairly swamped with orders. Some are too busy even to take the time to change their ads. This makes us smile and say "we told you so."

* * *

There is a much greater future for all lines of clay products than many who are engaged in their manufacture now realize. The faint-hearted brothers who at times think the business is on a decline do not appreciate the abiding utility of burned clay. Its uses will multiply as surely as the years come. No industry has a brighter or surer future.

* * *

Our home builders must, in the very nature of things, depend more and more upon the products of the clayworkers' kilns, both in the cities and towns, and in the rural districts, too, not alone because of the scarcity of other building materials, but because brick and terra cotta are superior. In this connection we ask the reader to turn to the first article in this issue and con the interesting narrative of old brick structures in the mother country and reflect that in the future we must of necessity build more for stability and safety as they have done. In other words, we will build more of brick and less of other materials.

* * *

Another of the archaic devices, the potter's wheel, is passing from us. Instead of the wheel we now have the press. We sometimes think that certain devices must last through all ages. It is only recently that blowing glass by machinery, rather than by hand, was developed as a practical possibility, and only a short time ago one would have said that the potter's wheel would be used through generations as it has come down to us through history. But it is easier to read history than it is to prophesy.

* * *

In some of the cities of this country asphalt gutters are now being repaired with brick. By placing the brick on the same foundation that has been constructed for the asphalt we will have a better street, better drainage; it is better for travel and in every way much more satisfactory than the asphalt. Bad foundations have made one of the factors which has damned brick streets in some cities. Good foundations are bringing brick pavements to the proper condition of appreciation.

REAL FIRE-PROOFING IS FIRE-PROOF.

With the Andrews fire in New York, following the Windsor Hotel fire, there comes the usual discussion about fireproof building and the croaking of the newspapers about the fireproof misnomer. There is no fault to be found with fireproof construction. The fault is with the construction which has claims for fireproof qualities set up for it by ignorance and cupidity. The truth of the whole business is that many of the so-called palatial residences of our great cities are mere pretense—fair on the exterior, made of good material, well put together, but tinder boxes on the inside. Often there is a liar on the inside. He tells people what a good house he has. The brick of the Andrews house were not destroyed; the burned clay was not injured, and therein is the key to the situation.

PRICES.

The season is far enough advanced to see that out of the experience of former years brickmakers have learned little or nothing with respect to maintaining a fair price for their product. History repeats itself in this matter every year. It is the effort to make early sales upon the first work put out. Where the work is controlled by architects it is their effort to get the work out as early as possible, and incite as much competition as possible. Even with the season which promises fair business a strong competition can be brought out on the first contracts let. The result is that a precedent is set. Prices once low in the beginning of a building season it is very difficult it pull them up. There is one sign of promise, small indeed, but yet fruitful, in the discussion which we have been hearing within the last few years in regard to possible understanding in the matter of prices. Some day it will materialize. It is disturbing that the business of brickmaking does not seem subject to the same sort of skill and business sagacity which has only recently changed many kinds of business from a condition not sufficiently profitable into one more satisfactory.

TRUSTS.

The air is full of the trust idea. Every time one picks up a paper one sees much space devoted to the formation of all kinds of trusts, coffins, glass, metal work of all kinds, tin plate, and, in fact, every manufactured product that one can think of with few exceptions. Even the cracker business is monopolized by a trust. A trust in the manufacture of floor tiles is now in process of formation. Even one in terra cotta has been under consideration. That, by the way, would be a matter of no great difficulty. We do not anticipate anything of that kind in the brick business for three reasons. The trust idea disposes of the thought of individuality, personal pride and name in business undertaking. Brickmakers, as we know them, are nearly all men of strong individuality, enamored of their work, and proud of their personal association with it. This is the first reason. Second, the formation of competing plants and the unlimited supply of material and transportation facilities would add to the difficulty, though this might not be insurmountable. Again, business experience in making brick has not been so wholly and universally bad as to have the educational value which developes trusts. Trusts usually are born out of lean years. We do not think any one would go into a trust as a matter of choice. There is something abhorent about entirely throwing away ones independence and personality. They grow out of mistakes which may be avoided by brickmakers by proper local combinations. Most of the failures in local combinations that we have known of have grown out of suspicion merely or small personal differences. The latter are often so trifling as to appear ridiculous on the face of things. In one instance an understanding was all but formed and was dissipated because one of the members was peculiarly active in securing contracts before the organization was assured, and made a showing of too much business in their final negotiations.

BRICK FOR FOUNDATIONS.

A few years ago in this community no one thought of putting any but a stone foundation under a brick house. At that time the mere name stone foundation was a certificate of character. Now it is quite different. The rubble stone contractors are almost out of business. The brick foundation laid in Portland cement is the rule. This is not because of a mere reversal in public opinion without cause, but for the reason that the science of brickmaking and the dispersion of knowledge through the brickmakers' conventions, trade journals and other channels, has produced a superior material. Then there has come the education in the use of cement, and as a natural result brick is the rule and not the exception. The movement is along the same lines for decorative purposes. Terra cotta and brick are taking the place of stone for the best buildings.

A GOOD BUILDING SEASON.

The low price of money for substantial improvements must necessarily auger well for brickmakers. Cheap money means substantial building. On the frontier of business money is high. In the West, in years gone by, when 10 and 12 per cent. was not an unusual rate, frame buildings and shabby structures were the rule. Most of the money used in the Chicago which burned was 9 and 10 per cent. money. The better buildings of Chicago to-day represent 4 and 5 per cent. money. The shabby brick structures in our own city were built previous to 1873 with 9 and 10 per cent. money. The best building that is being erected in our city to-day is with 4 per cent. money. Not that this work is done entirely with borrowed capital. But the money used was worth the rates named, and the money borrowed was obtained at those figures. When one builds with cheap money one builds well. When one builds with high-priced money one builds shabbily. Such buildings are usually shells of pretense. Brick and terra cotta, steel and the high-grade materials find their market during times like these.

CHANGE OF MANAGEMENT.

A change of management has taken place in the executive force of the American Clayworking Machinery Co., Bucyrus, O., made necessary by the retirement from active business of Col. W. C. Lemert, who for several years has been the main business head of that extensive establishment. Colonel Lemert, through a long and successful business career, has given many exhibitions of good judgment and wisdom, but in nothing has he shown greater wisdom than in thus early laying aside the cares of business and seeking a life of ease while yet able to enjoy it. In this he affords a shining example that many others similarly situated might follow with lasting benefit and credit to themselves, instead of continuing in the grind till failing health or waning powers compel them to retire when, as a rule, they are incapable of enjoyment of any sort, but just drag out a miserable existence despite their means.

The one great trouble with our successful business men is they never know when to quit; few know when they have had enough. He who has fifty thousand wants to double it; he who has a hundred thousand wants a million, and the millionaire wants a billion. They go on striving for more till they wreck their physical and mental strength, and ofttimes dissipate their financial capital as well. Our financiers need most to learn how to live.

Colonel Lemert's place will be ably filled by Raymond C. Penfield, assisted by W. H. Reehl, both of whom have been prominently connected with the business. The former will continue to make his home in New York city, Mr. Reehl remaining in charge of affairs at Bucyrus. While both are comparatively young in years, they are old in experience, having virtually grown up in the clay machinery business and are thoroughly familiar with every detail of the work, which will be carried on with the same energy and skill that has won for the American Clayworking Machinery Co. a world-wide reputation.

PROSPERITY AT GALESBURG.

Mr. William Simpson, of Chicago, who is now on the road for the Frost Engine Co., Galesburg, Ill., stopped in the Hoosier capital long enough recently to book an order for a dry-pan for the Indianapolis Terra Cotta Co., and say "howdy" to The Clay-Worker force. "Will" reports a happy business condition. The Frost Engine Co. are now doing the best business in their history. Have orders ahead sufficient to keep the shops busy for several months, and orders still coming in faster than they can care for them, although important additions were made to their factory early in the year. "Will" says that clayworkers appreciate a good thing when they see it, and they see it every time they look at their ad. This month it is on page 394.

BACK TO UNCLE SAM'S DOMAIN.

Our able correspondent, J. W. Carson, who has been connected with the LaPrairie (P. Q.) Pressed Brick Co. for several years, has accepted the position of superitendent of the Marion Brick Co.'s works at Montezuma, Ind., and henceforth will make the latter place his home. We welcome Mr. Carson to Hoosierdom, and trust he will become a permanent fixture in this section of Uncle Sam's domain. Those who want to consult Mr. Carson on any matter should address him at Montezuma, Ind., instead of LaPrairie, as stated in his ad. on page 408, the ad. having gone to press before notice of change of address was received.

ABOUT THE PARIS EXPOSITION.

Desiring to demonstrate to the world that the United States is supreme in the arts of peace, those having in charge the distribution of space at the great Paris Exposition request all who intend to take advantage of the opportunity to at once communicate with Ferdinand W. Peck, Commissioner General, Auditorium Building, Chicago, or Equitable Building, New York city, in order that they may be considered in the allotment of space, which will soon be made. While there are many applications on file in every line of industry, it is desirable that the American sections be not only representative of this country, but also represent the largest possible number of producers. Both our commercial interests and national pride demand that our works be entered in this most important international exposition. It is estimated that fully 60,000,000 people from every part of the globe will attend, and it will be an opportunity to greatly increase our foreign trade.

The Kentucky Fire Brick Works, Firebrick, Ky., write that they want to buy a good second-hand wet pan, seven or eight feet, top geared.

FT. WORTH BEGINS TO PAVE WITH BRICK.

Under the direction of W. Wassell and A. O. Jones, who, in former years, were engaged in making and laying paving brick in Ohio, Ft. Worth is now putting down her first block of brick pavement. The brick will come from the kilns of the Green-Hunter Brick Co., Thurber, Tex., and an excellent pavement will result, as their brick are considered first-class, and, laid properly, will give the citizens of Ft. Worth a street that will prove an example of up-to-date paving—a street that without repairs will stand the heaviest of traffic for years to come.

NEW CATALOGUE.

James W. Hensley, Indianapolis, has out a new catalogue of soft-mud or tempered clay brick machinery and a full line of hand and machine molds, trucks, barrows, carts, etc., and will take pleasure in sending a copy to any Clay-Worker reader who will ask for it.

A GOOD MAN WANTS A GOOD SITUATION.

A man who is thoroughly practical and competent, and has had extensive experience in the manufacture of sewer pipe, paving, building and mill brick, and has No. 1 recommendations, will be open for an engagement, after May 1, with some firm wanting the services of such a man. Competent to construct or reconstruct a plant. West or South preferred. Would go to Mexico, Cuba or Porto Rico. Address Practical, care CLAY-WORKER.

CYRANO'S APRIL FOOL.

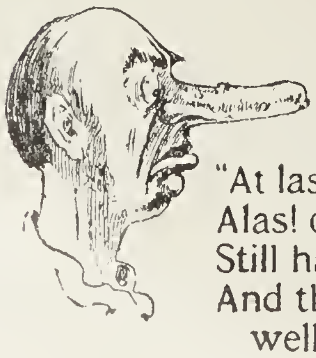
Old Cyrano de Bergeream
Went fast asleep and
dreamed a dream.

In which it seemed he'd
power to place
His nose on any other's
face.

He tried it on his poor wife
first
And laughed to see her anger burst.
The servant girl was next to
find
The Cyrano to her consign'd.

And when her beau
came in to tea,
She fell prostrated. So
did he.

Upon the dog it
next was placed.
And, lo! the cur
felt so disgraced,
He ran away and
had a fit.



"At last," quoth he, "I'm rid of it."
Alas! on all-fool's day he woke,
Still harnessed to his artichoke,
And though quite rich and quite
well fed
He will not now be comforted.

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WANTED—Position as superintendent or assistant superintendent of stiff clay brick plant. Many years experience and the best of references. [41 k] Address, BRO. WATKINS, care Clay-Worker.

WANTED —A situation by an experienced and reliable burner. Thoroughly competent to burn paving brick, dry press or common brick in up or down-draft kilns. Best of references. Address
4 1 d BLOND, care Clay-Worker.

WANTED—Position by general superintendent, thirty years practical experience manufacturing finest grades of front brick and all kinds of building material made from clay for New York and Chicago markets. Have constructed, also remodled works now running successfully. Excellent references. [4 1 lp] Address JAP, care Clay-Worker.

WANTED—A situation as superintendent by a man of years of experience and who thoroughly understands the manufacture of fine front brick, either dry clay or tempered process; fire proofing, sewer pipe and fire brick for all purposes, and a first class handler of men. Address
4 1 d BRICK, care Clay-Worker.

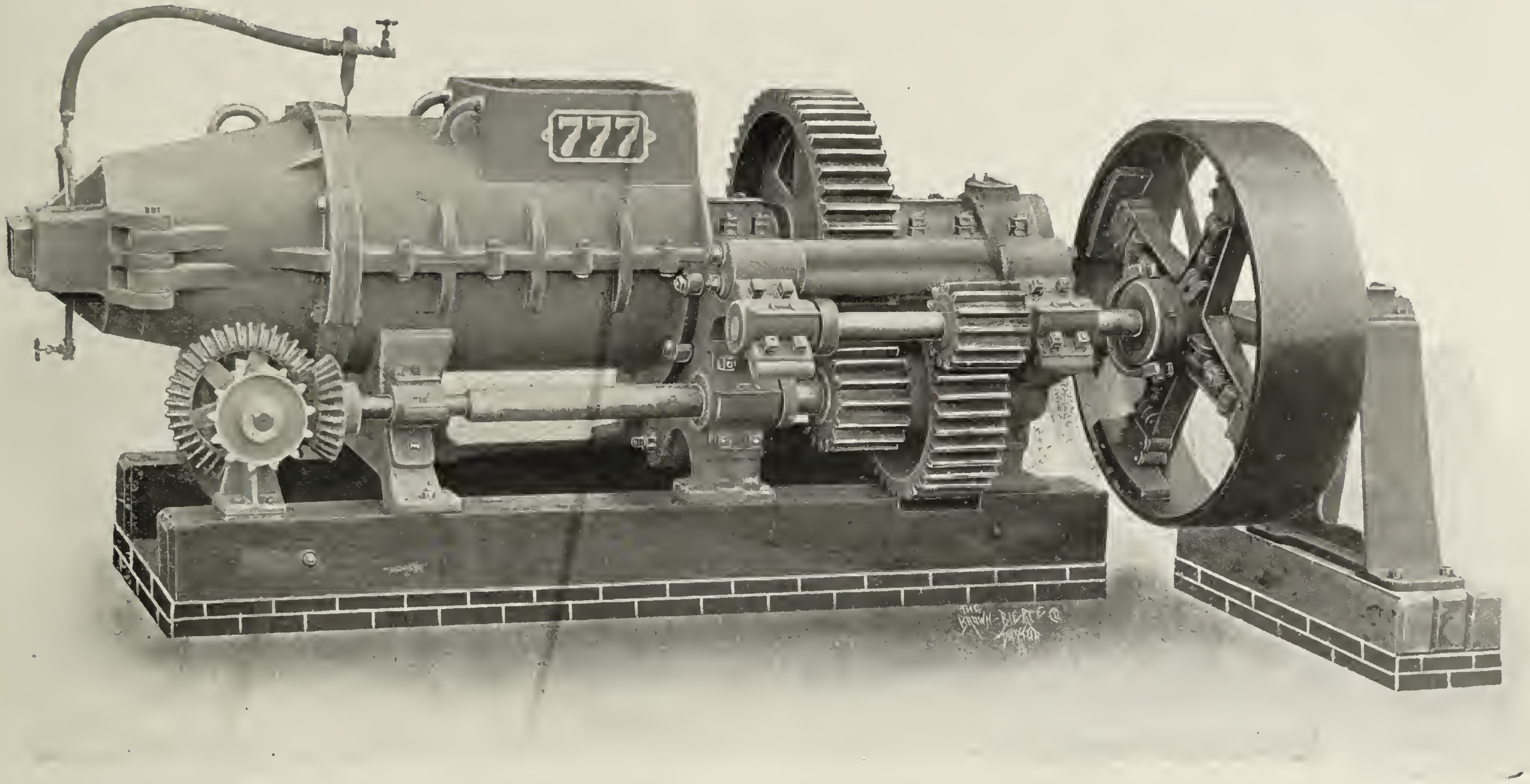
WANTED—A good reliable, competent man to take superintendency of a large hollow block and fire-proofing manufactory. A good position with good wages for a good man who understands the business and the management of men. None other need apply. Address,
4 1 d CAIRO, care Clay-Worker.

BOOKS FOR BRICKMAKERS.

"CLAY GLAZES AND ENAMELS," Henry R. Griffen, C. E. $ 5.00
"BRICKMAKER'S MANUAL," Morrison and Reep, 3.00
"BRICKMAKING AND BURNING," J. W. Crary, Sr., 2.50
"TABLE OF ANALYSES OF CLAYS," Alfred Crossley, 1.00
"VITRIFIED PAVING BRICK," H. A. Wheeler, E. M., 1.00
"PRACTICAL FARM DRAINAGE," J. J. W. Billingsley, 1.00
Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

Beautiful Homes
ARE BUILT WITH
Beautiful Brick
MADE BY
Beautiful Machinery.



777 BRICK MACHINE.

RAYMOND'S BRICK MACHINERY

Leads all others for high character of its construction, Greatest producing power, Most perfect product. All Raymond Brick Machines ever sold are in daily use. Unimpeachable testimony from manufacturers of highest standing
Our 1899 Catalogue, just out, upon application.

C. W. RAYMOND & CO., Dayton, Ohio.

PACIFIC COAST NEWS.

SINCE OUR LETTER last month, a changed condition has taken place in California. The dry spell has been broken with a copious rain from one end of the State to the other. The discouraging outlook of a month ago has all disappeared; a fair crop of grain and fruit is now assured, and, with the usual showers during next month, California should have a very prosperous year. Some sections where the drought was felt the most several banks were compelled to close their doors, but since the rains they have resumed business, and now feel very much encouraged with the outlook. In the clay industry there is quite a revival. Hands that have been laid off for a long time are now finding plenty of employment.

There is great activity throughout the building trades, and great things are promised. Architects are busy, and the real estate market is very active. Many are seeking building lots, and in the business portion of San Francisco, both unimproved and improved property is being held tight, the owners not being over-anxious to sell. Local trade is picking up, and the indications are that the brick and clay industry has seen its worst days, and will go forward with new hope.

The Pioneer Pottery Co., composed of R. T. Cox, J. King and H. Wiley, has been organized at Palouse, Wash., for the purpose of erecting and operating a complete pottery plant in that city.

There is a scarcity of building material in the city of Mexico. Brick plants, especially, are unable to supply the demands. The great sewer work in the city, on which 15,000 men are employed, has been stopped several times, because of the inability of the plants at Monterey, Mex., to keep up with orders. Contemplated buildings have been temporarily abandoned on account of the high price of material, caused by the heavy demands.

A new company for the manufacture of pottery, tiling and other clay products has been launched at Ogden, Utah. Articles of incorporation have been filed by the Ogden Pottery Company, with a capital of $6,000, all subscribed. The directors are: J. S. Smith, L. B. Ramsey, R. P. Hunter, O. A. Kennedy and S. F. Smith. The company will use potters' clay, found near Ogden and at North Ogden, and expect to control the trade of the entire intermountain region before long.

Messrs. Richard Truswell and A. C. Luff have formed a partnership for the manufacture of bricks at Trail, B. C. The capacity of the plant will be from 20,000 to 25,000 bricks daily.

One of the most prosperous manufacturing firms of Los Angeles and Pasadena, Cal., is the Pacific Brick Company. Their immense brick yards have a capacity of over 70,000 brick per day. They make a specialty of hard burned blue brick.

Experts have examined the clay beds west of Dallas, Ore., and report that vitrified brick clay of the best quality exists in inexhaustible quantities. Fire clay is believed to have been found.

Charley Stanton and J. I. Jones have purchased the brick and tilemaking plant of C. H. Wallace & Sons, of Creswell, Ore., and are now contemplating the removal of the same to Cottage Grove, Ore., where they will erect their plant.

Dodd & Lempke, the bricklayers of Albuquerque, N. M., expect to embark very extensively into the manufacture of brick at Gallup, N. M., within a few weeks. They have entered into a contract with the Crescent Coal Company for the use of the large clay deposit on the Crown Point property. Samples have been sent to the manufacturers of brick machinery in order to get machinery suitable for its manufacture. They expect to turn out about 20,000 brick a day.

The Diamond Vitrified Brick Company was recently incorporated in the State of Washington, capitalized at $25,000, to operate the plant of the Jensen Paving Company, at Russell, Wash. Nearly $85,000 has been invested in the plant for manufacturing the vitrified brick, and the first kiln of 130,000 will be turned out shortly. The directors of the company are: George W. Bates, F. S. Akin, Harry Howard, Sidney Smyth and E. G. Crawford, of Portland, Ore.

The West Kootenay Brick and Lime Company has purchased the brickyard, near the eastern limits of Nelson, B. C., from Henry Walters, and will operate it in connection with their other yards. SUNSET.

FROM TIDE WATER, VIRGINIA.

L. H. Clark & Son, of Alger, O., have bought 26 acres of clay land on Nansemond river, adjoining the Nansemond River Brick and Tile Co.'s plant, and have broken ground for their new plant. They expect to manufacture tile and hollow block principally, also brick. They will use down-draft kilns and steam dryer. They have 12 foot of white clay. Office, Suffolk, Va.

Batchelder & Collins, of Norfolk, Va., have bought a controlling interest in the Nansemond River and Brick and Tile plant, and will put in new machinery and dryers and fix the place up for a larger output this year.

E. W. Face & Son, of Norfolk, Va., have bought 20 acres more of clay land on the Nansemond river, adjoining their other clay bed.

Mr. T. M. Lilleston, of Suffolk, Va., is putting in a new brick plant ten miles below Suffolk, on the S. & C. R. R. He expects to ship his output to Suffolk and Norfolk by rail.

Mr. A. C. Larsen, who has been making brick at Suffolk, Va., for the last eight years, has moved to Santiago, Cuba, and will put in a brick plant there. His son will run his plant here as usual.

The outlook for this season is very good. There is not a yard in this section with any of last year's brick. They are all out except those who use dryers, and they are rushed for brick. There are less brick in this market now than has been for several years past, yet prices are low. P. J. O'NEAL.

AIDS TO LONGEVITY IN TEXAS.

VISITOR—To what do you ascribe your extreme age?

OCTOGENARIAN—Wal, I never stole a hoss, shot a neighbor's dog, or called a man a liar.

The "Monarch" BRICK.... MACHINE,

Unquestionably the ——

Leading Horizontal
"Soft-Mud" Machine.

More in use than other of its class.

◆

The—

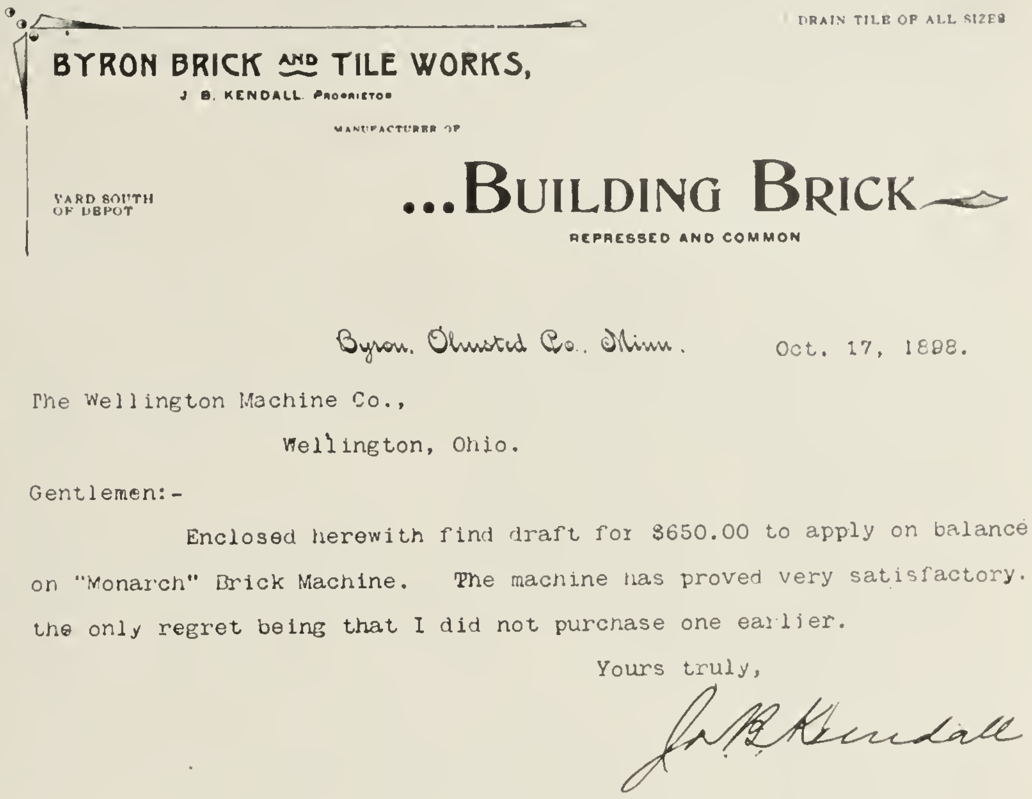
"Iron Quaker" Brick Machine

Unquestionably the ——

Leading Upright
"Soft-Mud Machine.
Horse and Steam Power.

More "Quaker" Machines in use
than any of its class.

HERE'S ANOTHER GOOD ONE.



DRAIN TILE OF ALL SIZES

BYRON BRICK AND TILE WORKS,
J. B. KENDALL, Proprietor
MANUFACTURER OF
...BUILDING BRICK
REPRESSED AND COMMON

YARD SOUTH
OF DEPOT

Byron, Olmsted Co., Minn. Oct. 17, 1898.

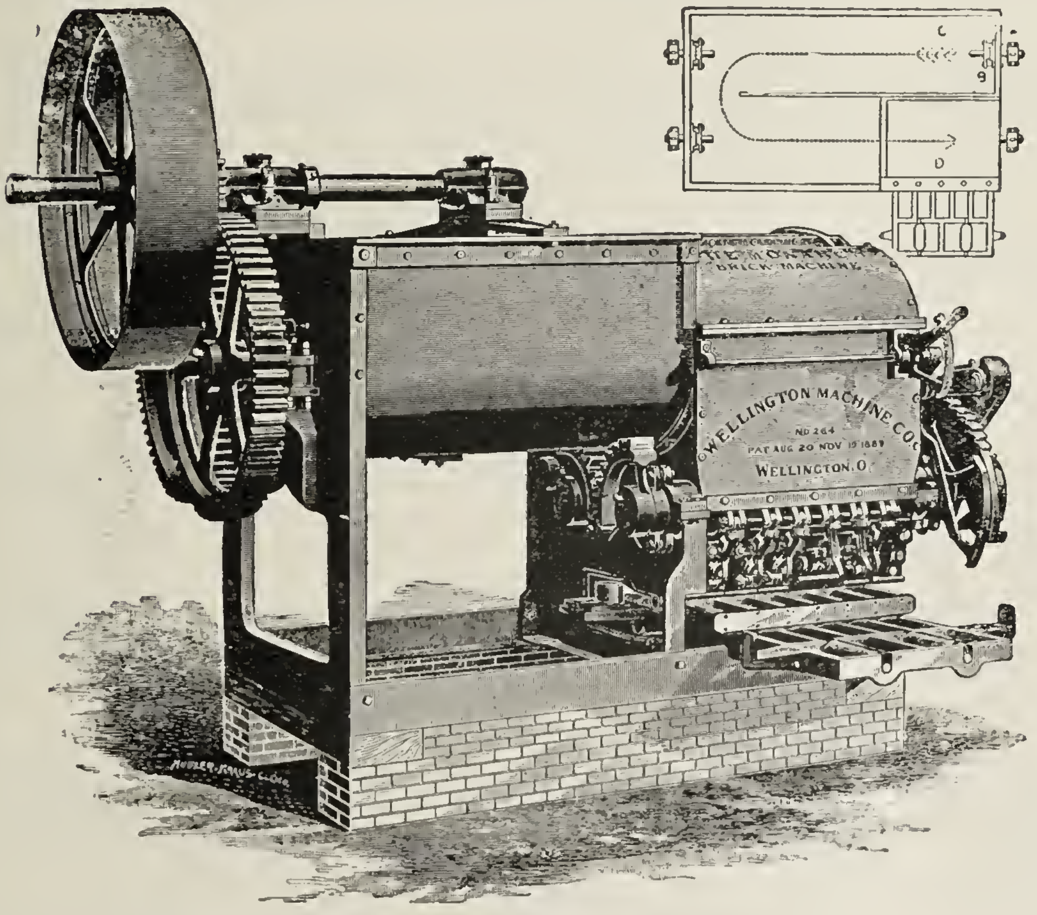
The Wellington Machine Co.,
Wellington, Ohio.

Gentlemen:-

Enclosed herewith find draft for $650.00 to apply on balance on "Monarch" Brick Machine. The machine has proved very satisfactory, the only regret being that I did not purchase one earlier.

Yours truly,

J. B. Kendall



We have the Best and Lowest Priced

Mold=Sander.

◆

No one else makes . . . .

**BALL-BEARING
TRUCKS and BARROWS.**

The Greatest Improvement in small articles ever put upon a brickyard.

◆

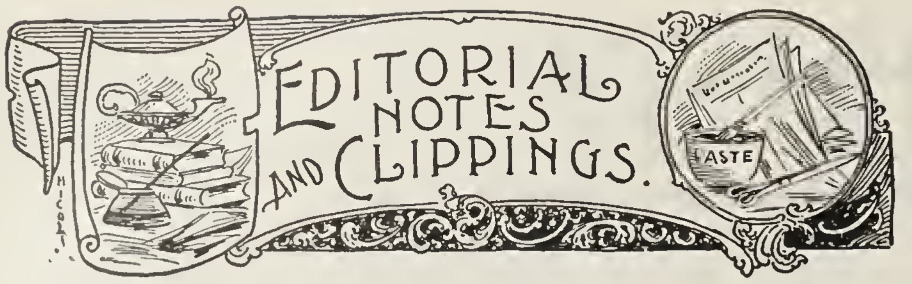
ALL OTHER AUXILIARY TOOLS,
MACHINES AND SUPPLIES.

The Wellington Machine Co.,

Send for Circular.

Mention the Clay-Worker

WELLINGTON, OHIO.



EDITORIAL NOTES AND CLIPPINGS.

Pulfrey & Pouch will open a brickyard at Jackson, Mich.

P. F. Hoadle will open up a tile factory near Maples, Ind.

Sioux Rapids, Ia., is to have a new brick and tile factory.

J. W. Darbyshire will locate a tileyard at Rushmore, O., in a short time.

Logan & Sons are building a new brick manufacturing plant at McKeesport, Pa.

Jesse Reynolds will very materially enlarge his brick works at Poplar Bluffs, Mo.

N. Sandee, of Stanton, Ia., contemplates locating a new brickyard at Essex, Ia.

Charles Valentine will manufacture brick at Monroeville, Ind., the coming season.

Charles Nelson, of Moorhead, Minn., has started up a brickyard at Red Lake Falls.

W. F. Hutchins, of Penobscot, Me., will run three brickyards at full force this season.

T. J. Toler and W. P. Dunn will operate the Crowley (La.) Brick Works the coming season.

Two employes of the Niles (O.) Fire Brick Co. were severely injured by the falling of a clay pan.

Samuel Lerch, a widely-known retired brick manufacturer, died in Easton, Pa., on the 5th inst.

The brick and tile works of Sidell, Ill., owned by David Beard, was destroyed by fire recently.

The Providence Pressed Brick Co. has been organized at Providence, Ky. V. R. Givens is secretary.

The Franklin Paving Brick Co., employing 100 men, has resumed operations after a shutdown of six months.

The Merchants' Brick Co. has been incorporated at Cleveland by J. C. J. Devis and others. Capital stock, $10,000.

Charles Montague will operate the brick plant at Caro, Mich., this season. The yard has been idle for some years.

D. E. Phillips has purchased the brick and tile factory at Kellogg, Ia., and will operate the same the coming season.

J. C. Stribling will put in some machinery with a view of enlarging the capacity of his brick plant at Pendleton, S. C.

The Defiance Brick and Tile Co. has been incorporated at Des Moines, Ia. F. M. McGuire and others are incorporators.

The death of George R. Berry, a well-known retired brick manufacturer, occurred last month at his home in Baltimore, Md.

A. T. Kennedy has purchased the entire interest in the business of A. T. Kennedy & Co., manufacturers of tiles, at Belle Center, O.

O. Nolan, of Eau Claire, Wis., will establish a plant at Ashland, that State, for the purpose of manufacturing tiling for sidewalks.

The Rome (Ga.) Brick Co. have booked a number of good-sized orders, one of which is for 3,500,000 brick for the Trion cotton mills.

J. T. Dudley will put up a plant for the manufacture of brick at Mandeville, S. C., where he has found clay of a superior quality.

Louis Adams, of Rossburg, Wash., contemplates establishing a brickyard at Republic, Wash., where there is a good opening for a brickyard.

A brick plant will be opened up at Lewisburg, Pa., by C. K. Sober and Frank Hare. They will manufacture both pressed and common brick.

Pettit & Cook Co. has been incorporated at South River, N. J., to manufacture fire brick, enameled brick and terra cotta. Capital stock, $20,000.

Messrs. Cravens and Price are interested in establishing a brick plant at Salina, Kan. It is said there is a good market there for building brick.

A. O. Jones, the well-known brick manufacturer, of Zanesville, O., in a recent letter, states that he is now connected with the Green & Hunter Brick Co., the general office of which is in Fort Worth, Tex., and works at Thurber. Mr. Jones is traveling salesman, with headquarters at the former place, and writes very enthusiastically of his new location. He says the Green & Hunter Brick Co. have one of the best equipped, largest and most successful brick plants in the country.

W. D. Simon, a brick and tile manufacturer of Jamaica, Ia., has purchased ten acres of land near Perry, Ia., on which he will erect a brick and tile plant.

J. C. Glimpse, of Carlock, has formed a partnership with Messrs. Fleming & Spencer, of Bloomington, Ill., and will engage in the manufacture of brick.

The Charleroi Brick Works has been incorporated at North Charleroi, Pa. Those interested are J. A. and J. T. Bowman, D. T. and C. A. Riffle and W. E. Brown.

Hill & Bros. have purchased the brick machinery formerly owned by the Roachdale Brick Co., and will manufacture brick as well as tile at their plant at Barnard, Ind.

J. S. Westbrook & Sons contemplate establishing a brick and tile factory at Wallace, N. C., and will be pleased to hear from manufacturers of brick and tile machinery.

A brick plant will be erected at Blacksburg, S. C., by the Cherokee Manufacturing Co., recently incorporated. They desire to correspond with brick machinery maufacturers.

The Huntsville (Ala.) Brick Works have started up in full blast for the season's run. They are turning out a fine grade of building and sidewalk brick at the rate of 30,000 brick a day.

A company has been formed at Trenton, N. J., to be known as the Newark Pottery Manufacturing Co. They will manufacture a general line of pottery. Their capital stock is $150,000.

The Ohio Clay Manufacturing Co. have made extensive repairs in one of its plants at Salineville, O., and will in a short time place an entire equipment of new machinery in the East End plant.

John R. Bass, superintendent of the clay mines of the Ottumwa (Ia.) Brick and Construction Co., was crushed to death in a fall of shale at the clay mines. He leaves a wife and two children.

A. C. Roder has leased the Manning brickyard at Matawan, N. J., and will manufacture hollow brick this season. Mr. Roder contemplates spending about $10,000 getting the plant ready for operation.

Newman-Carroll Brick Co. is the name of a new firm recently incorporated to manufacture brick at El Paso, Tex. Those interested are H. L. Newman, sr., and H. L. Newman, jr., and Charles V. B. Carroll.

The Fulper Potter Co. has been incorporated by George W., M. C., E. B. and Wm. H. Fulper, at Flemington, N. J., with a capital stock of $50,000. They will manufacture pottery, earthenware, terra cotta, etc.

Julius Gobeaux claims to have discovered an excellent quality of clay for paving brick at Minneapolis, Minn. He hopes to organize a company to work the material. Mr. Gobeaux himself is a practical brickmaker.

The Illinois Manufacturing Co. has been incorporated at Kansas City, Mo., for the purpose of manufacturing brick and other clay products. George H. Davis, Joseph E. Stanley and James E. Faris are the incorporators.

H. Major has sold his interest in the West End Brick and Tile Factory at Dixon, Ill., to F. Currans and W. S. Rosencrans, who, together with J. L. Major, who owns the remaining interest, will conduct the business in the future.

The James Gardner Fire Brick Works, located about six miles from Baltimore, Md., have resumed operations after having been closed down nearly a year. They have enough orders on hand to keep them running an indefinite time.

M. E. Gregory, of the Brick, Terra Cotta and Supply Co., of Corning, N. Y., in a recent letter says business is very good, and prospects are bright for a good year's trade. He is at present making some extensive improvements to the plant, adding two terra cotta kilns, extending sheds, enlarging steam plant, etc.

The Reese-Hammond Fire Brick Co., of Bolivar, Pa., are running their four plants to their full capacity, and are doubling the capacity of their No. 4 plant by putting in new machinery, erecting a new dryer 32x184, and other buildings, adding twelve new kilns, and expect in sixty days to have the capacity of the No. 4 plant up to 75,000 brick per day.

Lee Stanford, an employe of the New Kensington (Pa.) Brick Works, met with a distressing accident recently, which resulted in his death. He was running a machine when he slipped and fell, his left foot landing between the cogs of two wheels. Before he could be extricated the leg was so badly

[CONTINUED ON PAGE 374.]

HOW IS THIS?

Purchased the Fifth Machine and Thoroughly Satisfied.

April 8th, 1899.

C. & A. Potts & Co.,
Indianapolis, Ind.

Gentlemen:—We have lately started operating our **Fifth** machine purchased of you, and take great pleasure in saying that the machine is doing excellent work, our material being **shale** and **fire clays** and that we are thoroughly satisfied in every way.

The fact of our having purchased the fifth machine should be sufficient guarantee that we consider it the best soft mud machine on the market to-day.

Yours truly,
Marion Brick Works,
F. E. Butterworth, Gen. Man.

The Potts Horizontal Machine is the best made for working shale and fire clays.

They are the **Heaviest, Strongest** and **Most Durable** machine on the market.

They have no equal for tempering capacity, for making **straight square** brick which have clean, sharp corners and smooth surfaces.

We make a specialty of erecting complete plants of any desired capacity. It always pays to purchase the best.

For prices and terms, address

C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE
JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

EDITORIAL NOTES AND CLIPPINGS—Continued.

mangled that amputation at the thigh was necessary. The operation proved fatal, the young man dying shortly after the same was performed. He was but nineteen years old, and was unmarried.

Capt. John Porter will put the Congo brick works, above Empire, O., in condition to operate. The plant was destroyed by fire a couple of years ago, was partly rebuilt and then work suspended. The works will now be practically rebuilt.

The W. S. Dickey Clay Manufacturing Co., of Kansas City, Mo., report business as very active. In addition to their local business they ship two train loads of sewer pipe to Mexico every week. The pipe go to the City of Mexico and Guadalajara.

George W. Aulman, of the Eagle Iron Works of Des Moines, Ia., is at the head of a new company soon to be organized and which will be known as the Star Brick Co. They will put up a large plant and make a specialty of fine building and paving brick.

It was expected that parties would take the entire lot of second-hand machinery offered by J. F. Clark, but the deal fell through, and here he goes again. A fine lot of machinery nearly as good as new, at less than half price. See his ad. on page 376.

Sharpsburg, a borough of Pittsburg, is paving her streets with brick and asphalt. The firm of Booth & Flinn, the well-known brickmakers of the Smoky City, have contracts amounting to $60,000. All the streets now paved with cobble stones will be repaved.

The Jenkins & Reynolds Co., Chicago, announce that they have removed from the Chamber of Commerce Building to Nos. 15, 17 and 19 South Clinton street, where they will have their exhibit room stocked with a fine line of pressed brick and high-grade fire brick.

Mr. Henry Boyden, who for the past year has been operating the plant of the Lorain (O.) Brick Co., has purchased the entire plant for $26,350. He will make a number of improvements, putting in improved machinery, and will turn out paving, building and sewer brick.

The plant of the Williamsport (Pa.) Brick Co., which has been idle for a long time, has been leased by Bennett & Rothrock, contractors, together with a number of other prominent citizens of that town. The new company will manufacture all styles of fancy and pressed brick.

David L. Melick and R. T. Brown, young business men of Roseville, O., have reorganized the Brown-Melick Pottery Co. Both the office and plant of the new company will be located at Roseville. The young men have had practical experience in the business, which insures for them success.

The Cambridge Tile Manufacturing Co., of Covington, Ky., have had plans and specifications prepared for the remodeling and enlargement of its plant, in order to manufacture flooring tile. The plant now gives employment to 200 hands, and with the new addition will require 100 men.

Thos. A. Dobbins, president of the Purington Brick Co., Chicago, Ill., passed away, April 10, after an illness of three weeks. Although in his eighty-fourth year Mr. Dobbins retained all his faculties, and attended personally to all his business interests until the time of his illness.

A new concern, to be known as the Continental Clay Product and Brick Co., has leased the immense plant of the National Kaolin Co. at Brandywine, Pa., and will manufacture white and mottled brick. They have leased the plant for a period of ninety-nine years, and will make a number of improvements. The officers of the company are: President, S. Gratz, of Philadelphia; vice president, T. V. Cooper, of Media, and secretary and treasurer, Samuel W. Hawley, of Media, Pa.

A. C. Giveler, general superintendent and treasurer of the Fuller Brick and Slate Co., of Pine Grove Furnace, Pa., writes that his company is putting in a complete system of stiff-mud machinery, thereby adding vitrified paving to their line of various styles of face brick. Their equipment includes a "Wonder" machine and pug mill, Simpson represses and iron-clad dryer. These, with their Stevenson dry pans and Eudaly kilns, make their plant one of the best in that section of the country.

The brick mold establishment of Jas. B. Crowell, at Wallkill, N. Y., was burned to the ground at 6:30 the morning of March 30, entailing a loss of $12,000. There was no insurance on the plant, although Mr. Crowell sustained a similar loss two years ago. The fire is supposed to have originated from an explosion in the furnace. The loss falls heavily on Mr. Crowell just at this season of the year, when he is busy with rush orders for molds for the manufacturers starting up their yards for the season. Among the orders that were ready for shipment were orders for the Rose Brick Co. and the Brockaway Brick Co., Fishkill-on-Hudson, and the Java Brick Co., at Danskammer, N. Y. The Brockaway molds were particularly fine ones. Mr. Crowell expects to rebuild at once.

H. L. Boas, secretary of the Montello Clay and Brick Co., of Reading, Pa., writes that their factory is at present filled with orders, their entire output being sold out some months ahead at advanced prices over those of the last three or four years. This company has recently increased the wages of its employes 10 per cent.

The Kentucky Hydraulic Brick Co. is the name of a new corporation at Louisville, Ky., which has recently been organized, and takes in five of the representative plants of Louisville. They include the Hydraulic Pressed Brick Co., McDonald Brick Co., Conway Bros., Peter Bitzer Brick Co. and George Krupp. These plants will all be operated under the management of the new concern.

The old brick and terra cotta works at Bucyrus, O., has been purchased by Lewis P. Battefeld. He will make a number of improvements in the plant, and will manufacture both brick and tile. Mr. Battefeld has been connected with his father in the manufacture of tile for a number of years, and his experience and practical knowledge of the business will enable him to make a success of the new venture.

According to the New York Journal the one hundred and four negroes from Oklahoma, who got stranded in Jersey City, some time since, because the International Migration Society of Birmingham, Ala., failed to take them to Liberia, are out of their troubles. The Cliffwood Brick Co., of Matawan, N. J., notified Chief of Police Murphy that it will employ all the men, and the Central Railroad of New Jersey took them to Matawan.

Mr. F. R. Carter, the well-known brick manufacturer of High Cliff, Wis., has purchased what was formerly known as the Spurk paving brick plant at Peoria, Ill. This is the plant that was mentioned in the last issue of The Clay-Worker as having been sold to A. D. Thompson, city engineer of Peoria. Mr. Carter now has possession of the plant, and will make some material changes and improvements to same, adding new machinery, etc., so as to increase the capacity of the plant. The many friends of Mr. Carter will join us in wishing him success in his new location.

FOR SALE.

Two Penfield Brick Machines with Pug Mill—all iron—six moulds.

One Simpson Dry Press Machine.

These machines are in good order and can be seen at our Ruchs Hill Brickyard, Pittsburg, Pa.

We will gladly answer all communications regarding the sale of same.

BOOTH & FLINN, Limited,
PITTSBURG, PENN.

FOR SALE CHEAP.

A Good Dry Press Brick Machine, in good running order, will be sold for less than half first cost. Its all right and a bargain. Have changed to Stiff Clay Process. Address

"SECOND HAND,"
1 tf d care Clay-Worker.

WE HAVE RECENTLY ISSUED OUR

CATALOGUE No. 25

A Book of 380 Pages.

Which contains detailed descriptions and prices of **Conveying, Elevating and Power Transmitting Machinery,** such as **Caldwell Helicoid Conveyor, Elevator Buckets** and **Boots, Belting** of all kinds, **Pulleys, Shafting** and **Bearings, Car Pullers, Wire Cloth, Perforated Metal, Equipment** for **Rope Transmissions,** etc., and much useful **Engineering Information** applicable to our line of specialties.

A Postal Card from anyone interested in the machinery manufactured by us will bring a copy by return mail.

H. W. CALDWELL & SON CO. 127-133 West Washington St., **Chicago, Ill.**

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED —A second-hand dry press brick machine; two mold preferred. Address
4 1 em C. P., care Clay-Worker.

FOR SALE — Repress brick machine; price $50.
MOORE STORAGE CO.,
4 2 d 563 Grand, Kansas City, Mo.

WANTED — Position as burner in a paving or dry press brick plant; best of reference.
A. E. M.,
4 1 e Care Clay-Worker.

FOR SALE, CHEAP — One new two-mold United States dry press brick machine. Address BAY STATE IRON WORKS,
4 2 dm Erie, Pa.

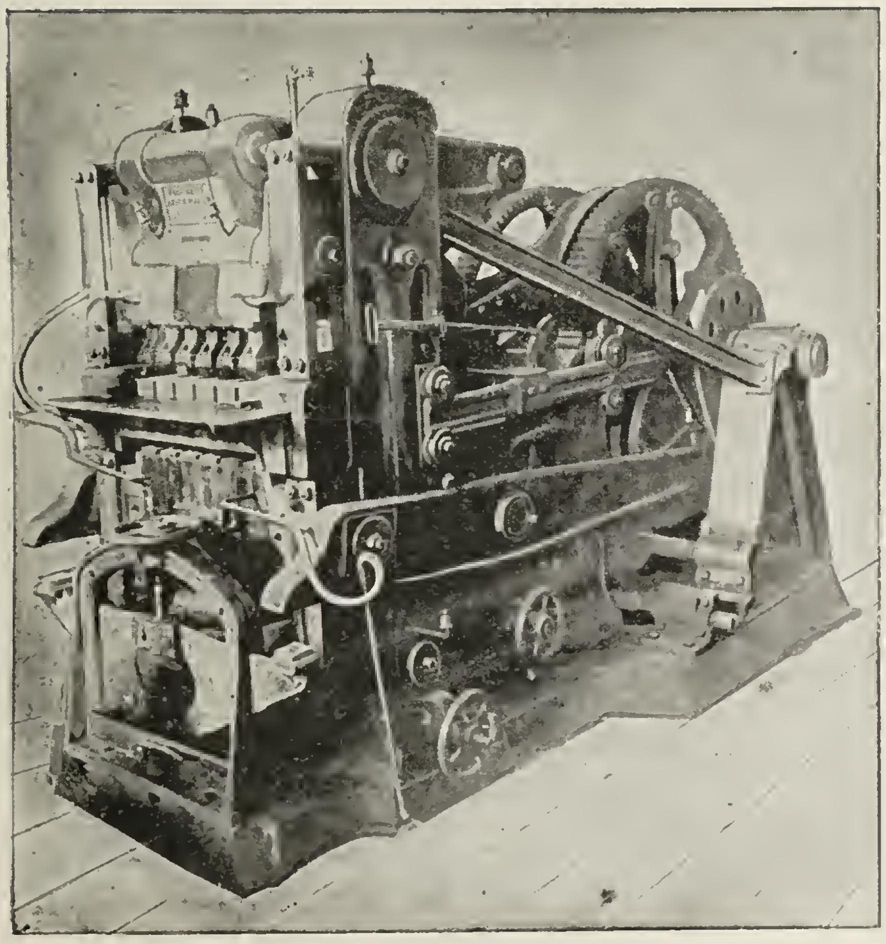
WANTED — A party thoroughly experienced in the manufacture of pottery; must have some capital to take part interest. Address
4 1 dm A. H. ZIMMERMAN, Mecca, Ind.

WANTED — Superintendent to take entire charge of yard; practical and competent in making and burning; must have high-class record for skill and character; dry pressed, plastic and pavers from hard shale. Address
T. W. J.,
4 1 d Care Clay-Worker.

WANTED — Position as superintendent or burner of dry pressed or plastic building brick plant; well acquainted with up-to-date methods in all departments of manufacturing same; No. 1 references given. Address
CINCINNATI,
Care Clay-Worker.

WANTED — A second-hand two or three mold brick press (dry or semi-dry), and dry pan or a plunger brick or tile machine; Penfield preferred; capacity from 10 to 20 M; end cut or side cut dies; cash for the right machinery at the right place. Address
C. B. C.,
4 1 e Care Clay-Worker.

The Progress Brick Press.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE
ON APPLICATION. . . . .

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R. *ST. LOUIS, MO.*

WANTED — 3,000 or 4,000 rack pallets, size 34x10. Address P. M.,
4 1 c Claymont, Del.

FOR SALE — 200 iron dryer cars, 150 Raymond patterns, 50 Chicago, two-foot gauge. Inquire
S. A. McMANIGAL, Receiver,
4 1 cm Columbus, O.

FOR SALE — One automatic end cut Chambers machine; 25,000 daily capacity; all complete and in first-class condition; a bargain. Write
CHAMPION BRICK WORKS CO.,
4 2 dm Wellsville, O.

FOR SALE — A brickyard with annual output of 400,000; drying sheds, good brick residence; five acres of land well set in fruit; good market. Address
W. A. BABCOCK, Ipava, Ill.
4 3 cm Or J. R. GAIN, Kokomo, Ind.

WANTED — Position as superintendent or burner in a dry pressed brickyard, by one who thoroughly understands the manufacturing of dry press in all departments; best of reference. Address
4 1 c C. H. M., care Clay-Worker.

WANTED — Capital needed to work a splendid deposit of fire clay; wonderful quartz sand alongside; junction of railroads; wide market; or will sell outright; samples and particulars furnished.
4 1 cm C. H. SMALL, Memphis, Tenn.

POSITION WANTED — With religious man, as foreman burner or to keep up brick machinery and steam dryers; had eight years' practical experience. Address
T. B. JONES,
4 1 dm Box 716, Macon, Ga.

WANTED — Situation as superintendent or burner by one thoroughly competent, and experienced in all branches of dry pressed manufacture. At present in charge of burning department of leading concern.
4 1 d] Address, X., care Clay-Worker.

WANTED — Superintendent, thoroughly posted fire clay work and machinery, Boyd dry press, economical labor manager, methodical, saving and competent to calculate cost of every part of production.
Address "PLASTIC,"
Care Clay-Worker.

WANTED — Position as superintendent or foreman; long experience in the manufacture of fire brick, hollow brick and porous fireproof building material, glazed sewer pipe and vitrified paving blocks; best of reference. Address
JOHN CLAYTON,
4 1 cm Perth Amboy, N. J.

POSITION WANTED — A continuous kiln man expert burner and setter, with wide practical experience on both sides of the Atlantic, also well up with the down-draft kilns, at present employed as boss burner, desires a change. Address
CONTINUOUS KILN MAN,
4 1 1p Care Clay-Worker.

FOR SALE — Controlling interest in a vitrified paving brick plant; daily capacity, 60,000; five down-draft kilns, 200 capacity each; fine shale bank, with four-foot vein of coal under property; one of the best locations in the Southwest; to a practical brick man this is a fine opening. Address
4 3 c GAR, care Clay-Worker.

FOR SALE.

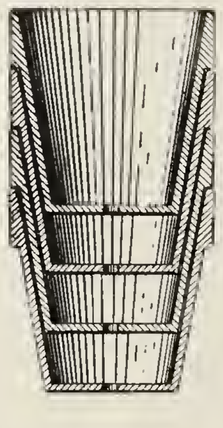
No. 1 Michigan brick and tile machine, with upright pug mill, pulleys, cutting tables, tile dies, 2½ to 12 inches, hollow block die, 8½x4⅛, hollow brick die, 4⅛x2⅜, face plates and cross bars.

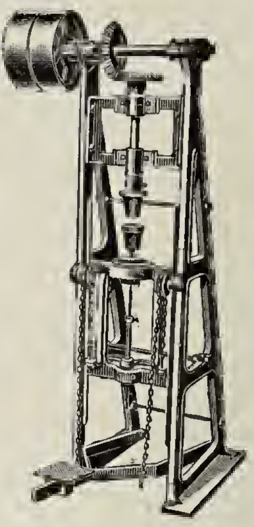
No. 2 Michigan brick and tile machine, with pulley, cutting tables, tile dies, 2 to 8 inches, three-column end cut brick die, face plates and cross bar, complete.

No. 2 Adrian brick and tile machine, with pulley, cutting tables, tile dies, 2 to 8 inches, two-column end cut brick die, cross bar.

Two roller tables and stands, two flexible tile cutoffs, two No. 4 end cut tables, one No. 6 side cut table, one No. 4 side cut table, one No. 4 hollow block table, one No. 2 style A Potts disintegrator, one No. 2 crusher and elevator, one "Little Giant" repress, belts, trucks and wheelbarrows, tank 150 barrels capacity, 54-inch hot blast apparatus by Huyett & Smith, two Raymond side dump cars, one 10 H. P. upright engine, one watchman's clock, eight day.

The whole or any part of above for sale very cheap.
J. F. CLARK,
4 3 d Morenci, Mich.





Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,
78 South Pennsylvania St., INDIANAPOLIS, IND.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS. Agent and Patentee, **161 Grand Street, Rahway, N. J.**

"LEVIATHAN."

"Upon Earth There is not His Like."

....Sept...... 1896.

MAIN BELTING CO., 55 and 57 Market St., Chicago, Ill.

Gentlemen:—Please ship us via freight, 146' x 18" 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige. Yours very truly,

....

Manufactured under Special Process.
A Guarantee of Superiority.

NOTE—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

Main Belting Company,
Sole Manufacturers LEVIATHAN BELTING,
55 and 57 Market St., CHICAGO, ILL.

PHILADELPHIA:
1219 Carpenter Street.

BOSTON:
120 Pearl Street.

Do Not Make Dry Press Brick

..... WITHOUT .....

The Carmichael CLAY STEAMER.

T. W. CARMICHAEL, Manufacturer, Wellsburg, W. Va.

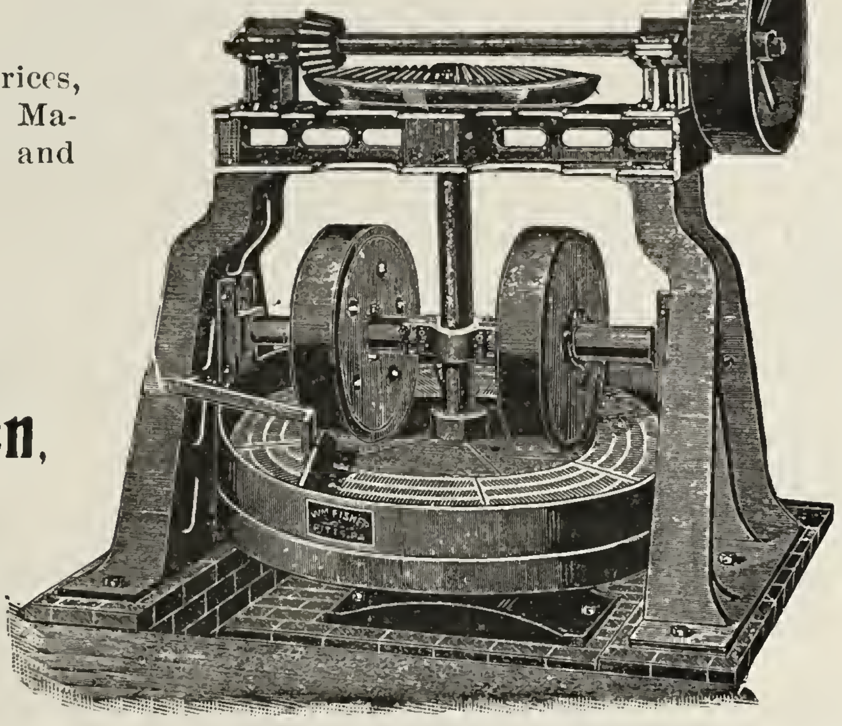
Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

••••

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

••••

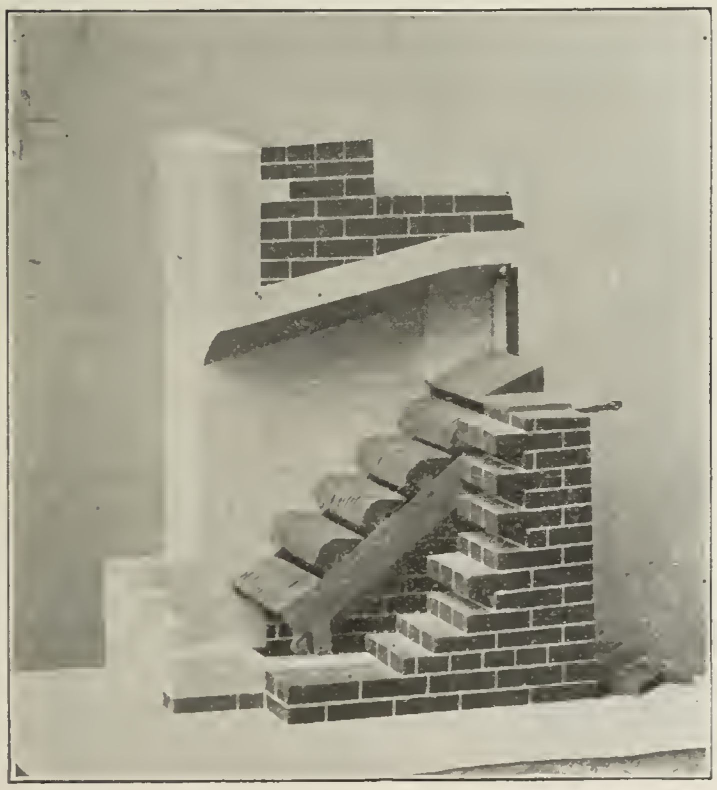


Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry
and Machine Works,

24th and Smallman Sts.,
PITTSBURG, PA.

The ALSIP IMPROVED.... KILNS

Have more points of superiority than any others on the market. Will be pleased to tell you all about its merits.



"PATENT APPLIED FOR."

The ALSIP KILN Furnace Grate,

Can be **attached** to **any style of kiln furnace.**

It is a **coal coker** and a **gas generator.**

Is **self cleaning** and has a **gradual feed.**

Is **simple and durable.**

Nothing but **coal slack** needed for **fuel.**

Guaranteed to save **labor and fuel.**

Investigate and be convinced.

S. H. ALSIP, *Belleville, Ill.*

FOR SALE — 150,000 new and second-handed pine pallets, 32 and 34 inches long, ten wide.
J. F. STENGEL,
1 6 c Ellicott Square, Buffalo, N.Y.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — Several second-hand chain hoists, from 2 to 8 tons capacity; also several engine lathes, boilers, engines, pumps, etc. Address CLEVELAND,
3 tf d Care Clay-Worker.

WANTED — Position as foreman or burner; I understand fire brick, shale, stiff and soft mud, dry press, up or down draft kiln; 28 years' experience; A-1 references. Address H. P.,
4 1 d Care Clay-Worker.

FOR SALE — Ross-Keller 6-mould dry press; Creager mud machine; 125 H. P. engine; two 70 H. P. boilers; dry pan; pulleys, belting; blacksmith outfit; trucks, pallets, fire brick; 4 ft. grate bars; pump. Used little.
GEORGE MATHERS,
2 3 c 960 Nassau St., Cincinnati, Ohio.

FOR SALE — One Old Reliable soft mud brick machine, geared for steam, with six molds, bump and dump tables, sand and water boxes; the outfit is in good repair, and will be sold very cheap. Address
"CRAWFORD,"
3 3 d Care Clay-Worker.

FOR SALE — Second-hand brick machinery of all kinds, very cheap; brick machines, cutting tables, pugmills, represses, screens, etc.; will give some great bargains in this class of machinery; write us for prices and description of what we have. Address
THE BONNOT CO.,
3 3 d Canton, O.

FOR SALE.

One second-hand soft mud Standard brick machine. W. E. Tallcott & Co. make. This machine is all iron, and will make brick as good as when new. Price $100 (one hundred dollars).

Will sell also one second-hand portable engine and boiler on skids; 20 horse power, for $200 (two hundred dollars). Skinner make. Erie, Pa.

C. & L. MERRICK,
4 1 d Syracuse, N. Y.

FOR SALE CHEAP.

One Henry Martin brick machine and pug mill, capacity 30,000; very good order.

One brand new Horton sander; never used.

One 40 H. P. engine

16,000 white pine brick pallets, 34x10, made of thin strips, with foot, height 4 inches; all nearly new.

Reasons for selling, changed to stiff mud.
Address SOUTH,
4 1 d Care Clay-Worker.

FOR SALE.

We have for sale the following second-hand brick machinery, in good condition, viz.:

One 24-in. Buffalo exhaust fan, good as new.

One (1) 19-in. Letter "C" Newell Clay Mill, used about one month.

Six (6) Two-wheel Spring Trucks for stiff mud or dry press brick, in good condition.

One (1) ea. No. 1 and No. 2 bottom dumping clay cars, style "F," American Clay-Working Machinery Co. make, in good order.

One (1) ea. Raymond "Columbian" and "Victor" represses.

Two hand-power represses, in fair condition.

One (1) E. M. Freese & Co. stiff mud machine and cutting table, side cut, 30 M. capacity, in good condition.

One (1) smooth roll tailings crusher, Frey Sheckler.

One (1) nine-foot Stevenson dry pan, wood frame.

One (1) Frey Sheckler "Acme" side cut stiff mud brick machine, fair condition.

SUBURBAN BRICK COMPANY,
2 3 cm Wheeling, W. Va.

FOR SALE — One of the best paying brick and tile factories in Iowa.
12 tf d Lock Box 36, Lohrville, Ia.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Wellsburg, W. Va.

FOR SALE OR LEASE. — Stoneware plant in the middle Trans-Mississippi country; capacity 2,000 gallons per day; demand exceeding capacity; prices good. Address
2 tf d "POTTERY," care Clay-Worker.

FOR SALE—GREAT BARGAIN—Henry Martin "A" Brick Machine, capacity 30,000, very good order; pug mill, crusher, elevator, shafting, etc, $750. All in first-class working order. Good 30 horse power Erie engine and boiler, $400.
1 tf dm BOX 13, care Clay-Worker.

FOR SALE—Four-mold Boyd Dry pressed brick machine, quite new, at half cost. Capacity 25,000 to 30,000 per day. Also one 4-mold Eureka dry pressed brick machine, good order; great bargain. One straight line engine, 14x14 cylinder; excellent order; very low. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator.
C. SIEDLER, Pres.
9 tf d 156 Fifth Ave., New York, N. Y.

FOR SALE.

75 horse power Westinghouse Engine.
3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
6 spring brick trucks.
Lot shafting, belting and pulleys.
1 Barr Pumping Company steam pump.
All new or little used, and in excellent condition.
WALNUT,
1 tf d Care Clay-Worker.

FOR SALE.

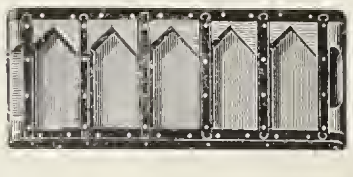
One Monarch machine, only used one short season.
One extra heavy Quaker machine in good order.
One, horse power machine which we will guarantee good as new, was used to test clay, making about 100,000 brick.
HORTON M'F'G. CO.,
11 tf d Painesville, Ohio.

FOR SALE

One 1½ yard Marion steam shovel.
Lot of new and second-hand dump cars.
Seven narrow gauge and one standard gauge second-hand locomotives.
One Potts Stock Brick Machine.
One Potts sanding machine.
One seven-foot horizontal pug mill.
Two vertical pug mill, etc.
We manufacture a full line of grinding and mixing pans for brickyards, chemists, smelter, clay pot manufactures, etc. etc.
THOMAS CARLIN'S SONS,
Allegheny, Pa.

The Henry Martin Brick Machine Mfg. Co.,
Lancaster, Pa.

Machine Brick Moulds
a Specialty.



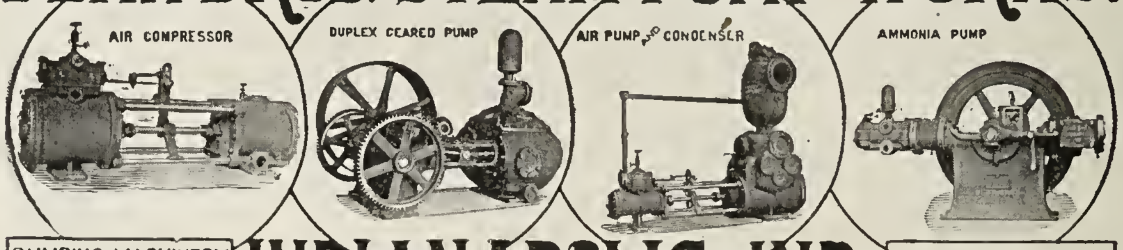
PRICES:

Steel bound machine moulds, 5 or 6 brick	$1.75 each
With Steel Lined Heads, 5 or 6 brick	$2.00 each

With Panel Bottoms, solid, 5 cents per brick extra.
With name plates 5 cents per brick extra.
Top irons dovetailed, or crimped if preferred. Handles any desired pattern.
SEND US A SAMPLE ORDER.

FIRE Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio. **BRICK**

DEAN BROS.' STEAM PUMP WORKS.



PUMPING MACHINERY FOR ALL PURPOSES
INDIANAPOLIS, IND.
SEND FOR CATALOGUE AND PRICES

Do You Want

CREDIT REPORTS on men who make BRICK, on men who buy BRICK, on men who sell BRICK? Trustworthy service at lowest prices; ordinarily $1.00 for each report.
RELIABLE LIST of BRICK manufacturers and Supply men, in any State, in any Country? These can be furnished at small cost, usually $1.00 for any single list.
ADVANCE REPORTS that are advance reports of all contemplated construction work calling for BRICK?
TO KNOW how to sell BRICK to the Government? Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, **ASSOCIATED TRADE & INDUSTRIAL PRESS,**
ESTABLISHED NINE YEARS. Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.

S. GEYSBEEK,
CERAMIC CHEMIST. CLAY EXPERT.
New Brighton, Pa.

Gives advice and adjusts difficulties in brick, sewer pipe, enamel brick, terra cotta and in all branches of the pottery industry. Gives estimation on the commercial value of clay deposits. Will introduce cone system for burning. Plans for trial and frit kilns with latest improvements. Write for terms.

IF YOU NEED.. **Wooden Pallets**
—WE CAN FURNISH YOU THE BEST

We make all Styes of
Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*
We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . .
Send for circulars and prices.

W. B. MERSHON & CO.,
Saginaw, East Side Mich.

Mey Detachable Chain Belt.

Ewart Detachable Chain.

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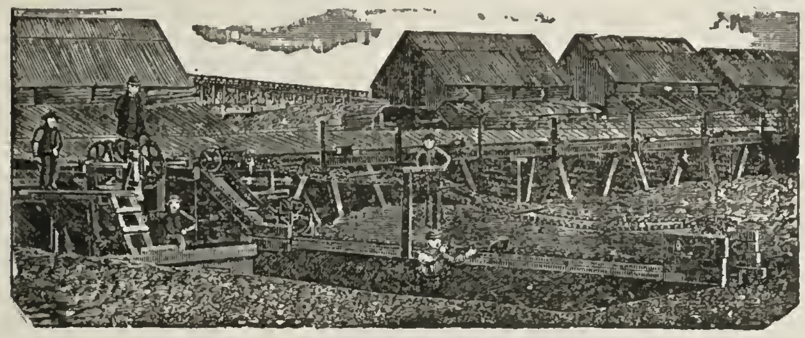
Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.



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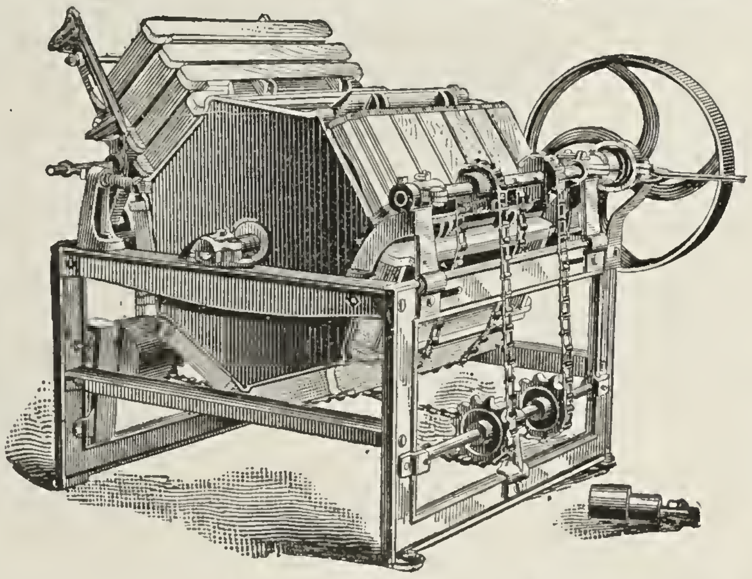

We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been sucessful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

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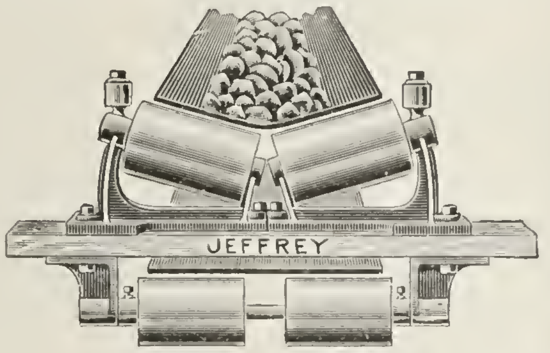

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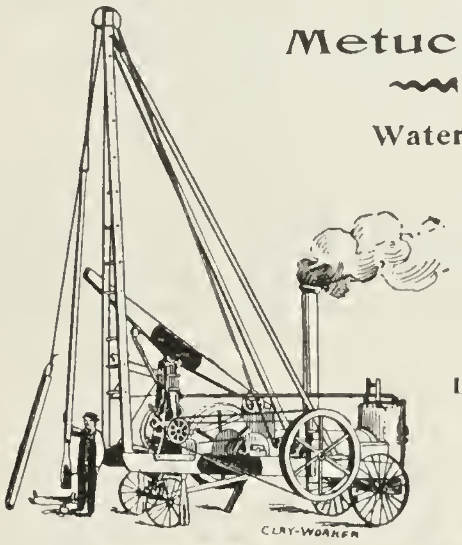

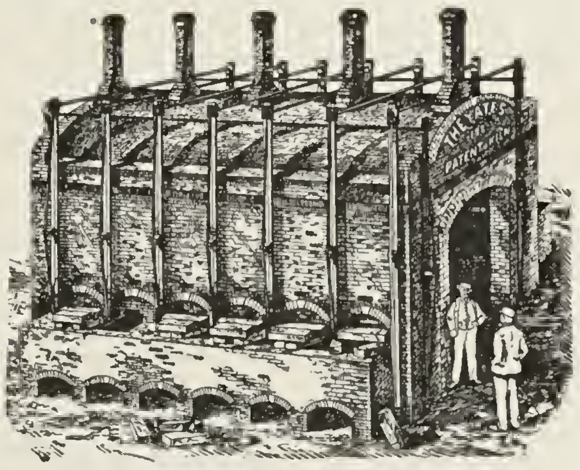

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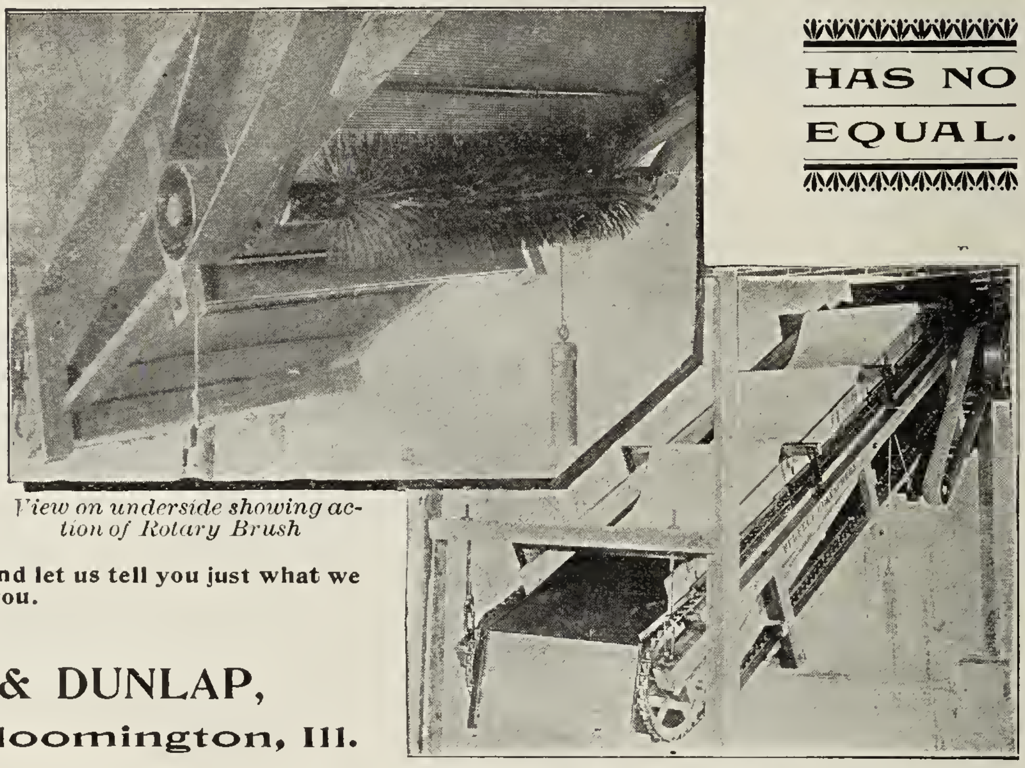

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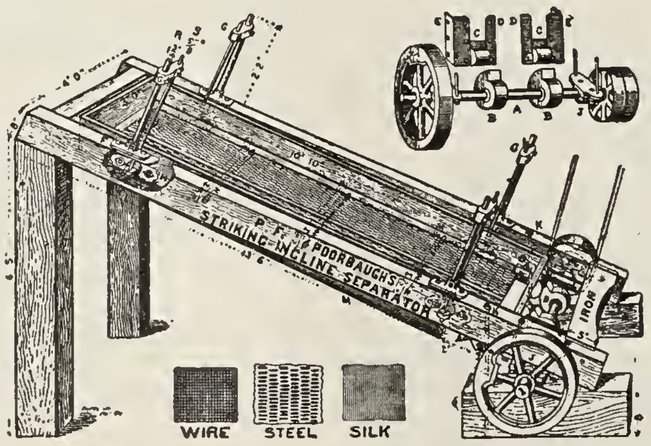

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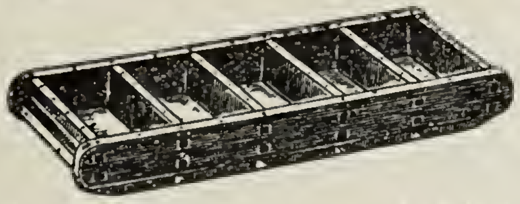

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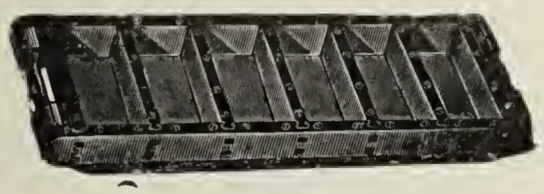
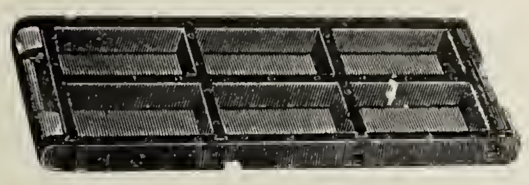


6 Brick Machine Mold.



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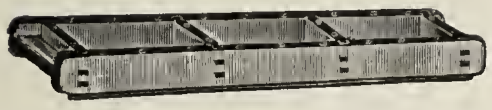

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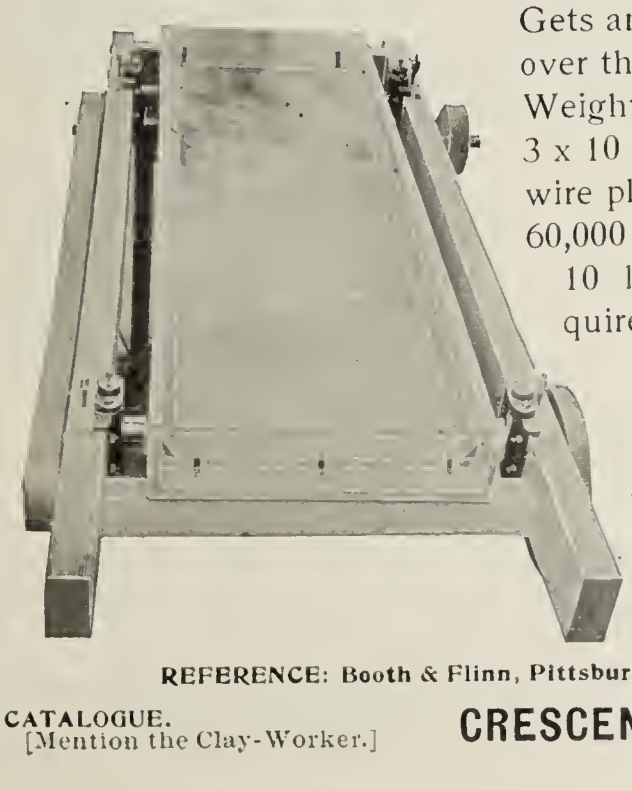

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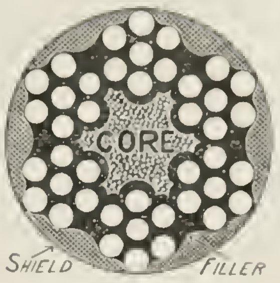

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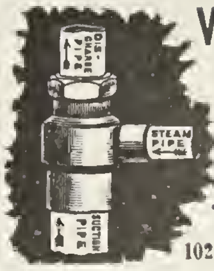

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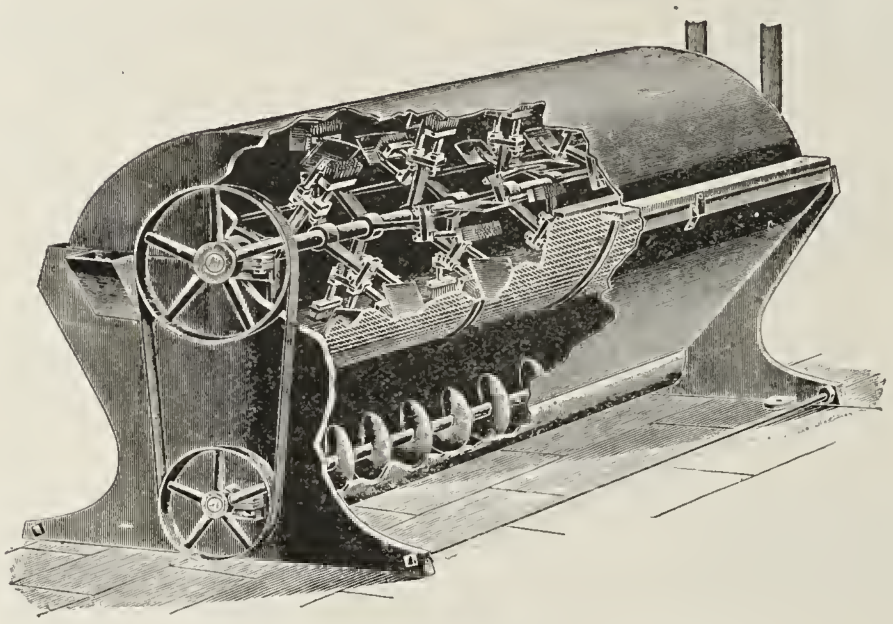

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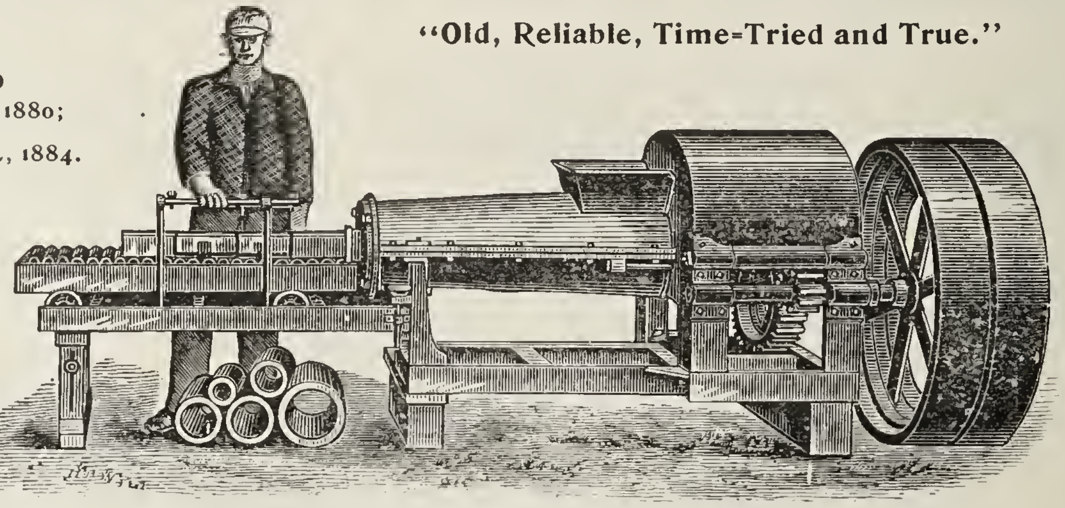

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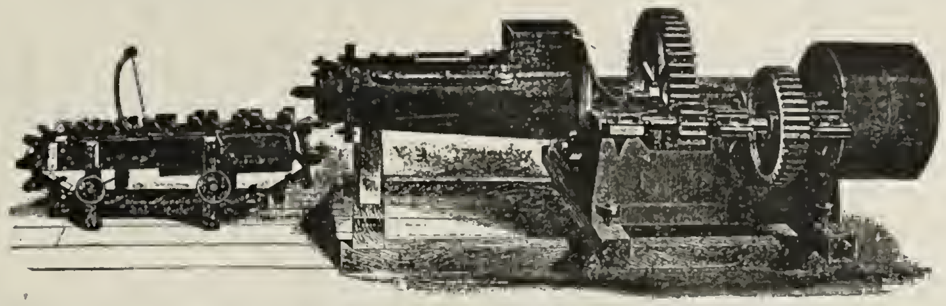

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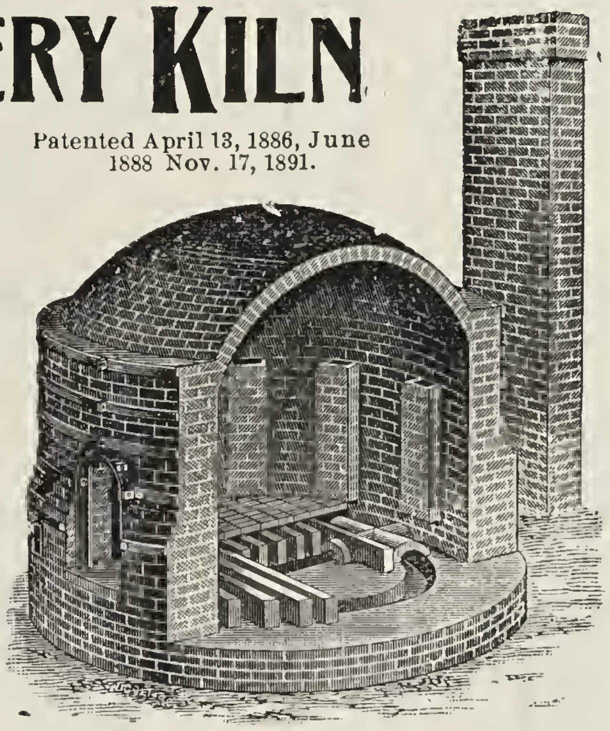

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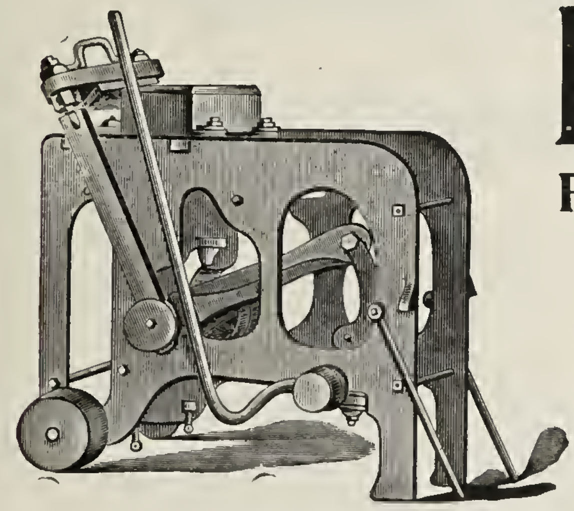

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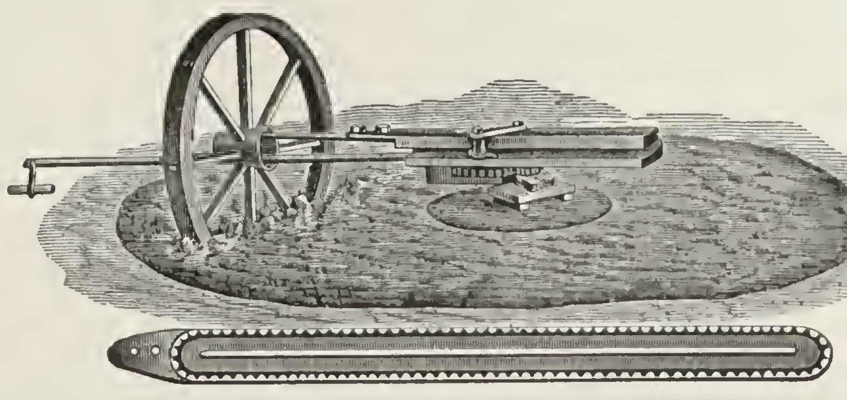

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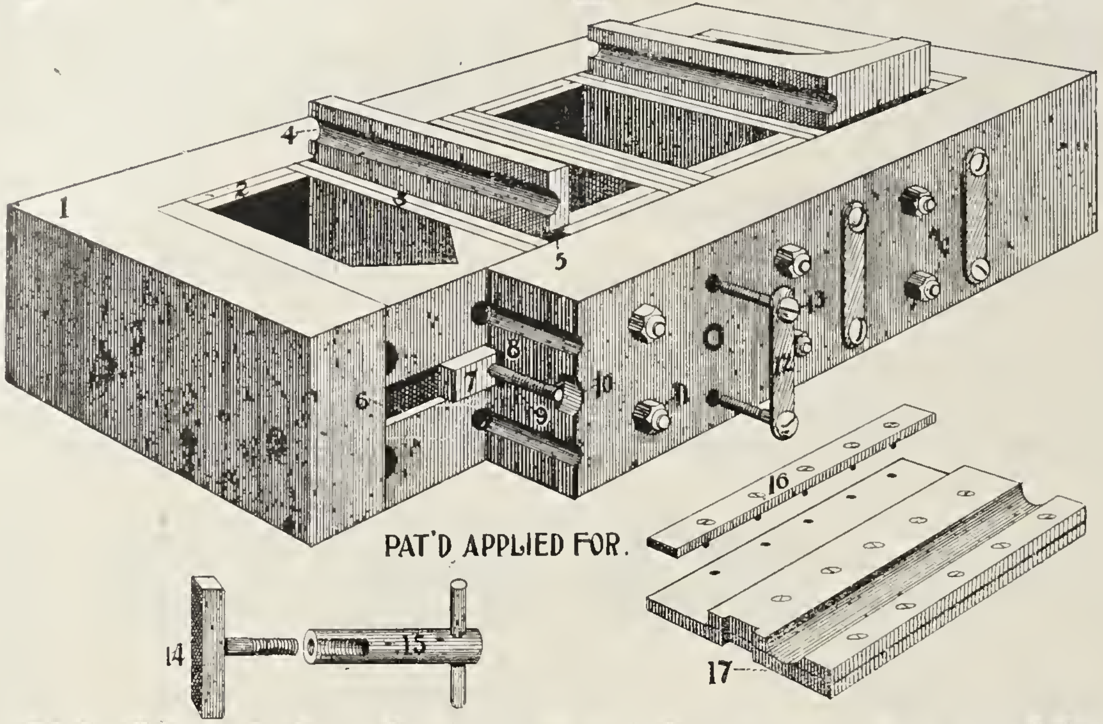

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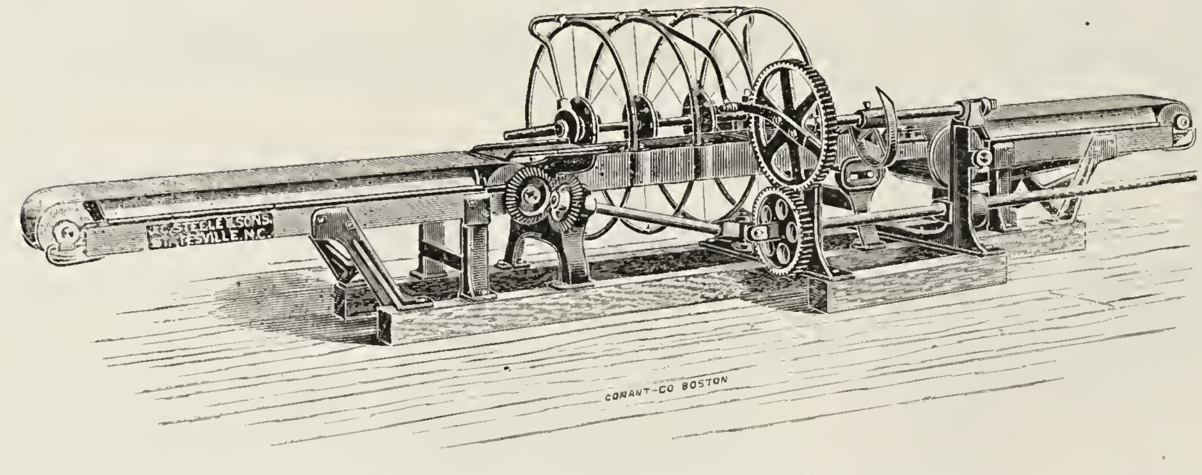
Arch Brick, Sizing Machines and Patent Automatic Liner Grinders.

Ervin Special Machine and Tool Co.,
25-27 Champlain St., CLEVELAND, OHIO.

Steele Brick Machinery

NO FAILURES. COMPLETE OUTFITS.


J. C. STEELE & SONS STATESVILLE, N.C.
CONANT-CO BOSTON

Automatic End and Side Cut Table by Changing Cutting Frame.

Lavinia, Ga., September 12th, 1898.
Messrs. J. C. Steele & Sons,
Statesville, N. C.

Gentlemen:—Your favor received, and in reply beg to say that the Steele Brick Machine is as good as I want. Can make 40,000 per day with it. I am more than pleased with the automatic cut-off. Yours truly,
J. H. SEWELL.

Mr. Sewell is using our Xtra Machine with automatic cutting table.

J. C. STEELE & SONS,
Manufacturers of
The "NEW SOUTH" BRICK MACHINERY,
Statesville, N. C.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

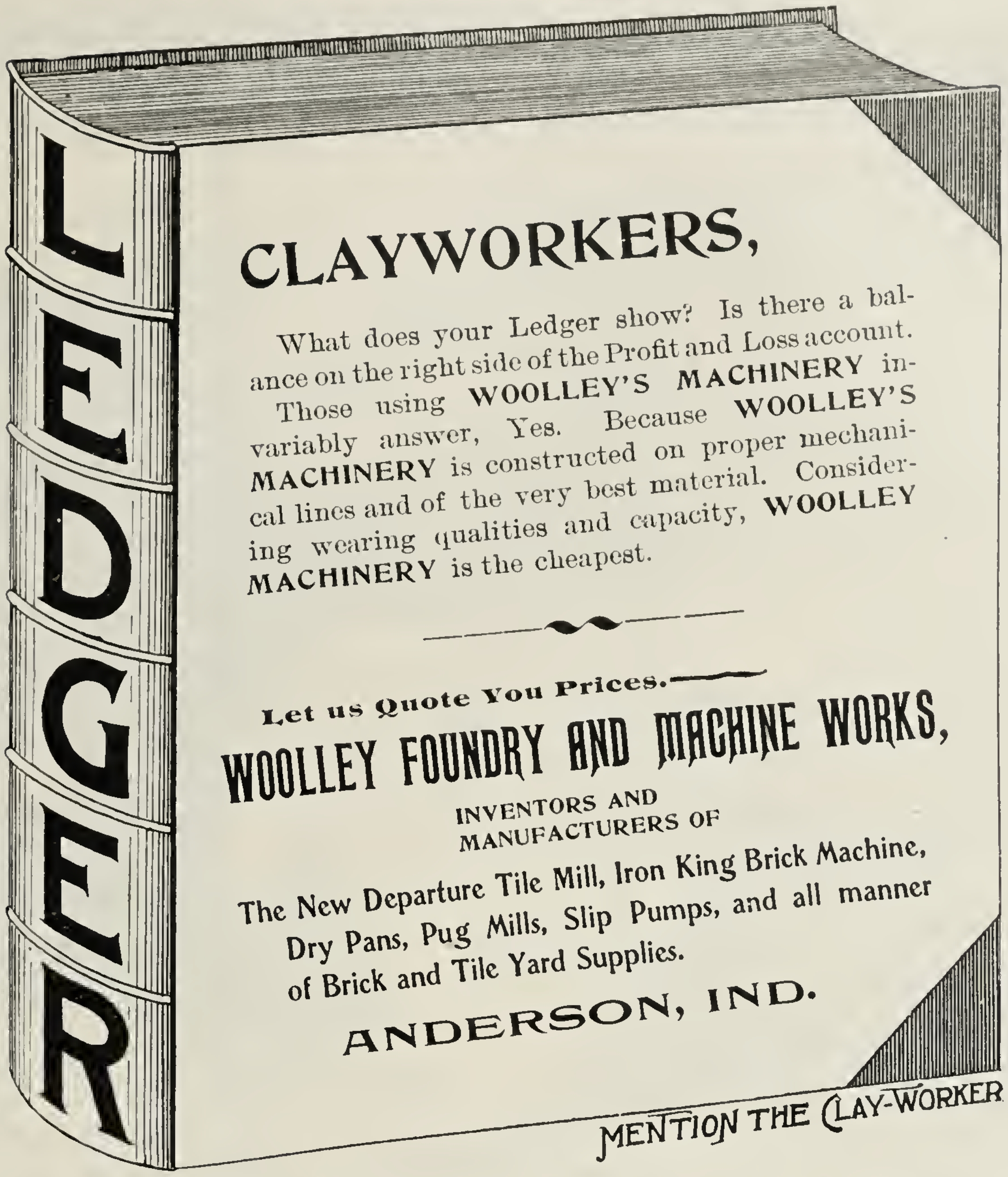
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.



CLAYWORKERS,

What does your Ledger show? Is there a balance on the right side of the Profit and Loss account. Those using **WOOLLEY'S MACHINERY** invariably answer, Yes. Because **WOOLLEY'S MACHINERY** is constructed on proper mechanical lines and of the very best material. Considering wearing qualities and capacity, **WOOLLEY MACHINERY** is the cheapest.

Let us Quote You Prices.

WOOLLEY FOUNDRY AND MACHINE WORKS,

INVENTORS AND
MANUFACTURERS OF

The New Departure Tile Mill, Iron King Brick Machine, Dry Pans, Pug Mills, Slip Pumps, and all manner of Brick and Tile Yard Supplies.

ANDERSON, IND.

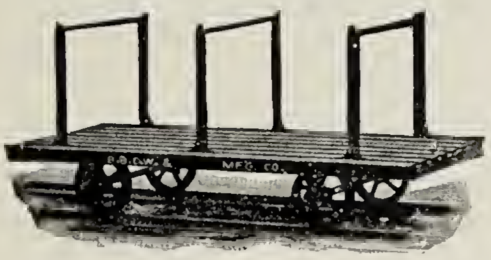
MENTION THE CLAY-WORKER

The Atlas Bolt & Screw Co., Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

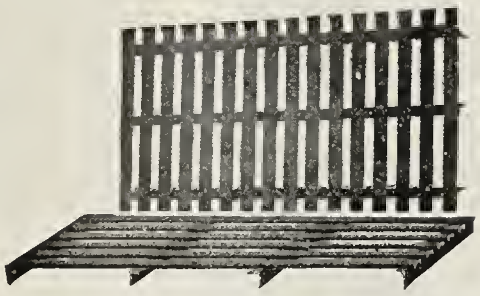
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

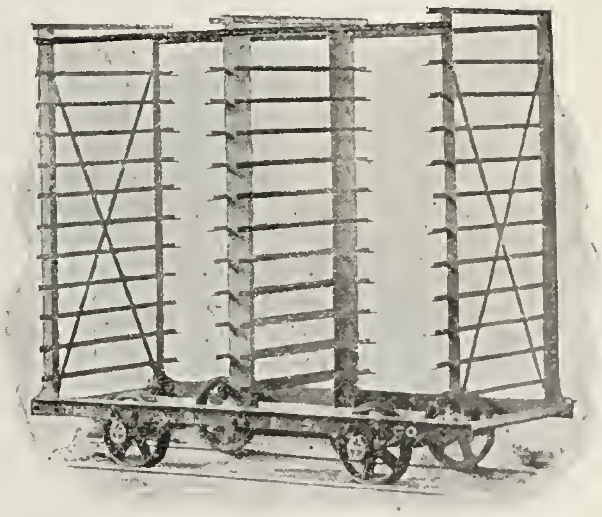
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet 2 inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

The Repress that Gives Entire Satisfaction.

Chattanooga, Tenn.

Ohio Ceramic Engineering Co.,

Gentlemen:—We beg to advise you that we are very well pleased with the three Represses purchased from you, and that they are doing our work in a manner entirely satisfactory to us.

Yours truly,
TENNESSEE PAVING BRICK CO.

Cumberland, Md.

Ohio Ceramic Engineering Co.

Gentlemen:—We have two of your Represses in operation at Washington, and will state that we find them to be everything that you claimed them to be. We have no hesitation in recommending your presses to any who are in need of such machinery.

Respectfully yours,
J. F. MERTEN'S SONS.

Reading, Penn.

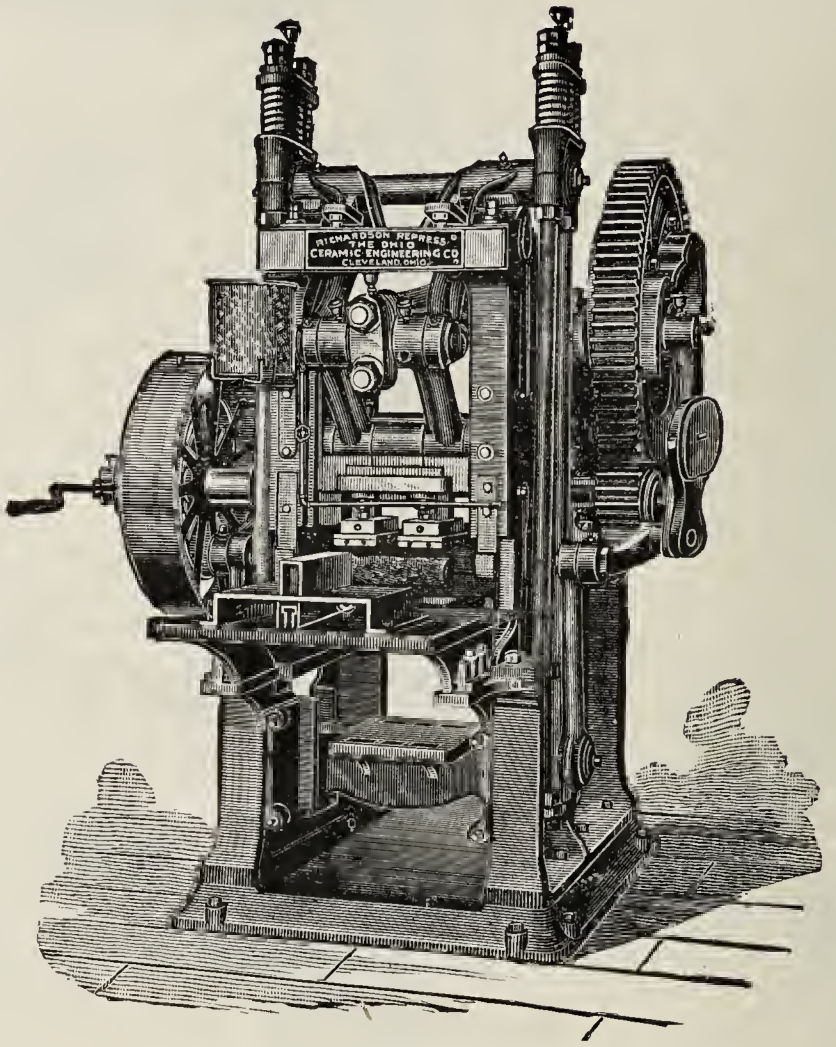
Ohio Ceramic Engineering Co.

Gentlemen:—The Richardson Repress which we purchased of you has been working continually for the past year. It is giving us entire satisfaction, and is doing its work promptly, with little or no repairs. We can safely recommend this press to anyone who may be in need of this class of machinery.

Yours truly,
MONTELLO CLAY & BRICK CO.

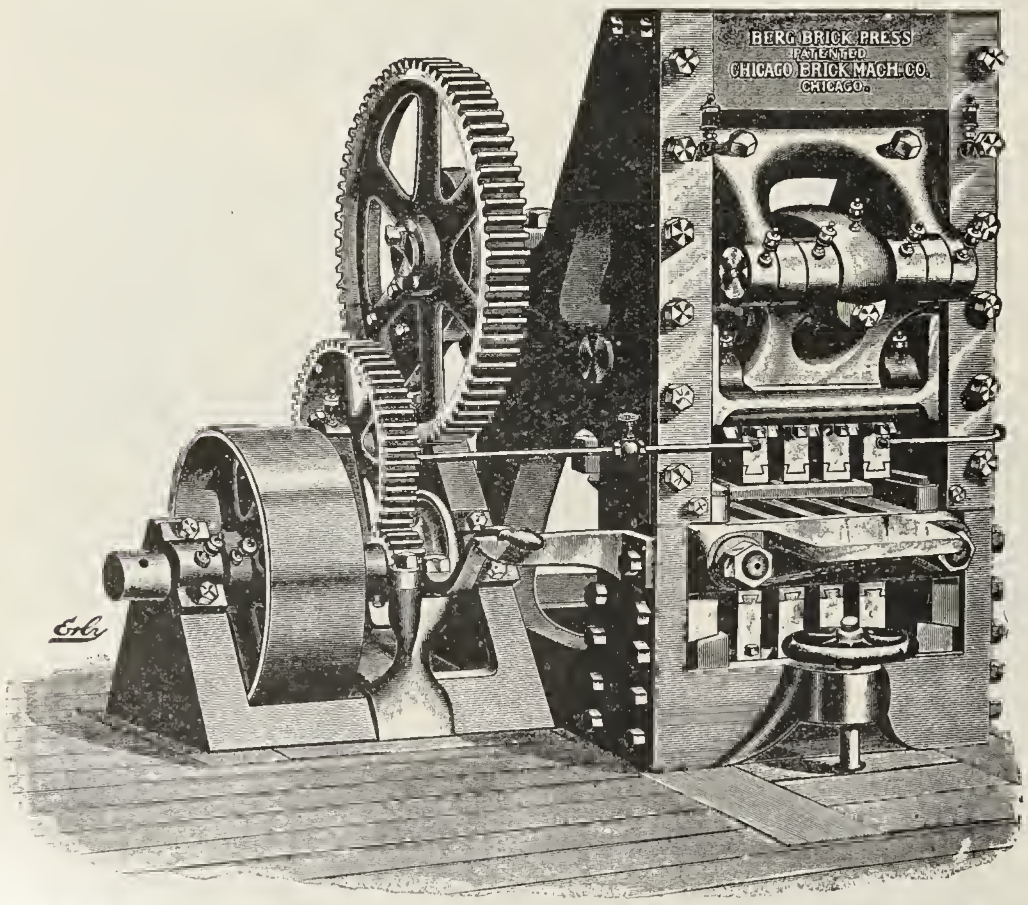
YOU SHOULD PROFIT BY THE EXPERIENCE OF OTHERS. SEND FOR CATALOGUE.

The OHIO CERAMIC ENGINEERING CO., CLEVELAND, OHIO.



THE RICHARDSON REPRESS.

Up=to=Date Machinery.



OUR **BERG BRICK PRESS** is the Most Modern in design and construction of all Dry Press Machines. Simplest, Strongest and most Durable.

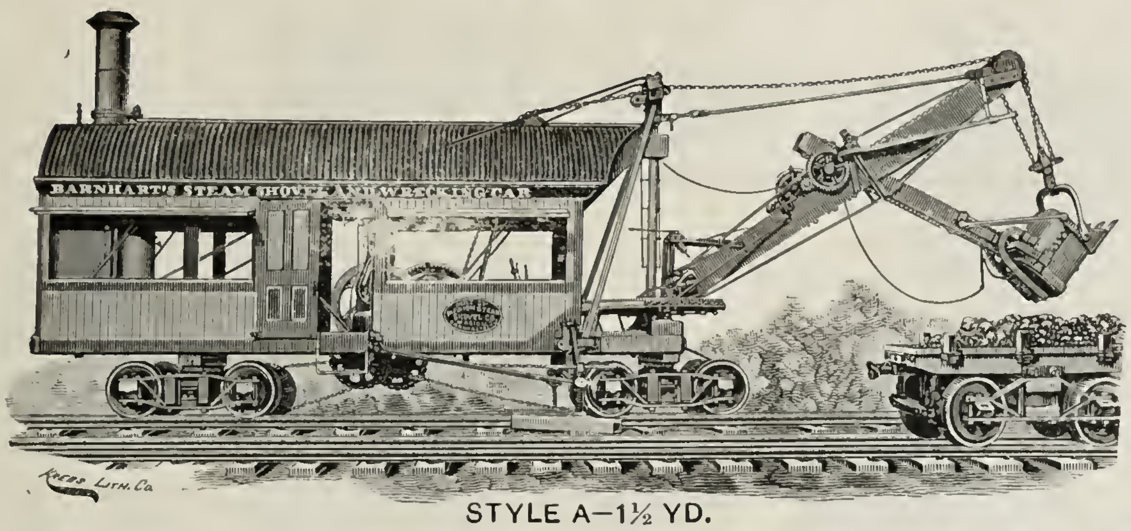
It has three distinct pressures and an unequalled Mold Box. Absolutely unbreakable and fully guaranteed. Circular on application.

Our line of **Stiff Clay** and **Soft Clay Machinery** is also strictly **Up-to-Date.** All the latest improvements and most convenient devices.

Send for new 1899 catalogues.

CHICAGO BRICK MACHINERY CO.,
225 DEARBORN STREET.

Steam Shovels for Brickyards.


BARNHART'S STEAM SHOVEL AND WRECKING CAR

STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

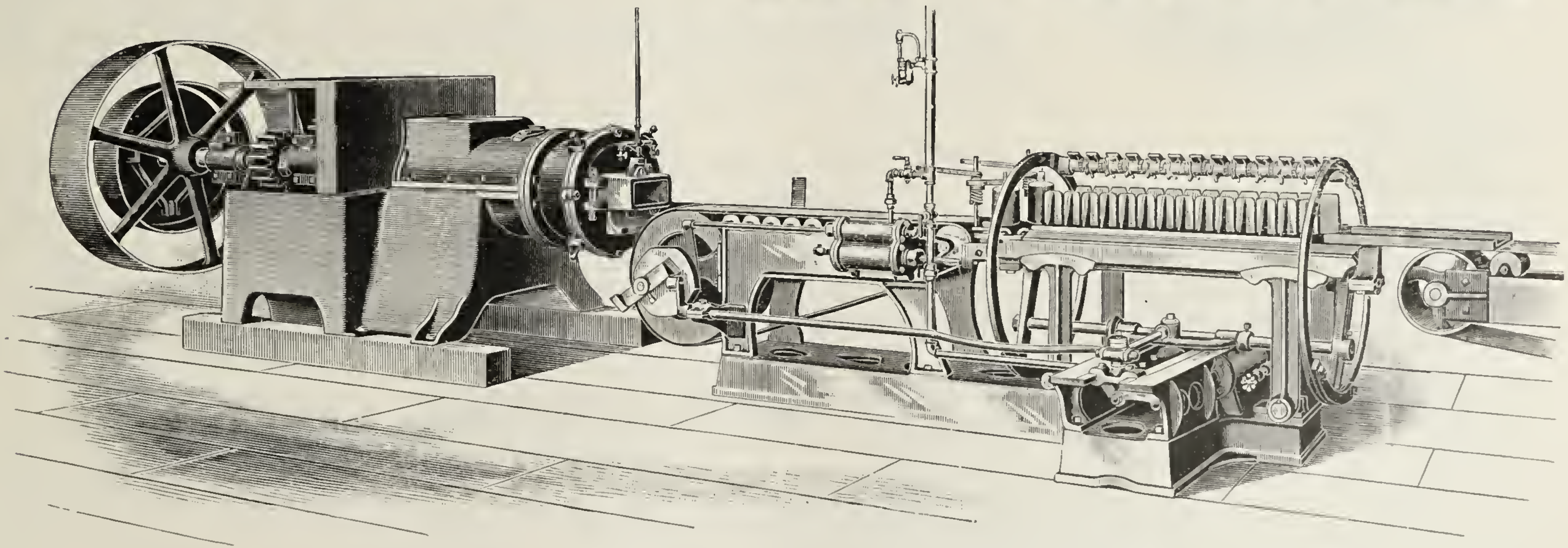
The Marion Steam Shovel Co.,
603 West Center Street, - MARION, OHIO.

STYLE C—¾ YD.

THERE'S ONE BRICK MAHCINE

That does the most work of the highest quality with the least power and repairs,

That's the Leader.



LEADER No. 25, SIDE CUT DIE AND AUTOMATIC CUTTER.

Send your address for printed matter.

LEADER MANUFACTURING CO., Decatur, Ill.

Have You Ever Considered This?

That a Very Small Quantity of

Dixon's Ticonderoga FLAKE GRAPHITE.

Say 5 to 10 per cent. added to the grease or oil that you are now using, will make you oil or grease do three to six times as much work and do it much better.

This has been fully demonstrated but if you want to prove it for yourself we will send you samples free of charge and a pamphlet giving full particulars.

JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

Horseheads Brick Co., N. Y., August 13, 1898.

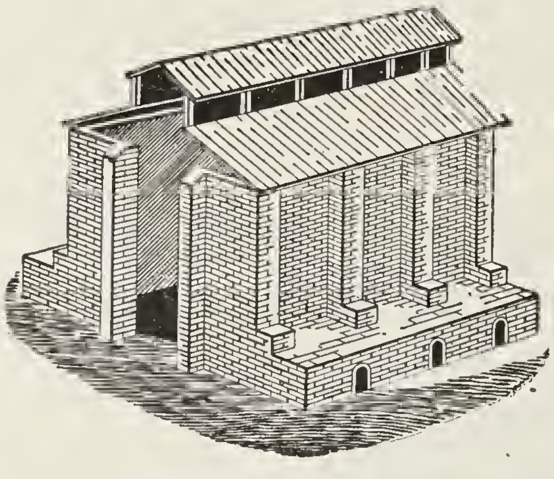
Mr. H. HAIGH, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success. In fact we have been able to do much more than you had guaranteed the kiln would do. We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours, R. G. EISENHART, Treas. and Gen. Man.

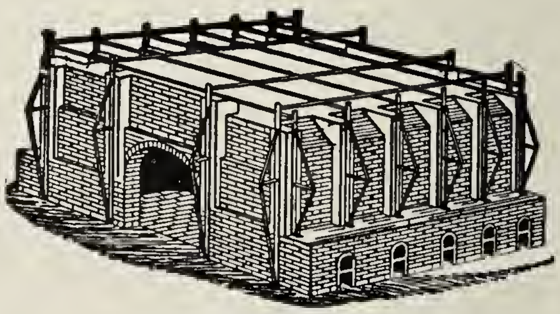
For further particulars, address H. HAIGH, Catskill, N. Y.


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.


Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, 2,422 Chestnut St., Kansas City, Mo.

MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

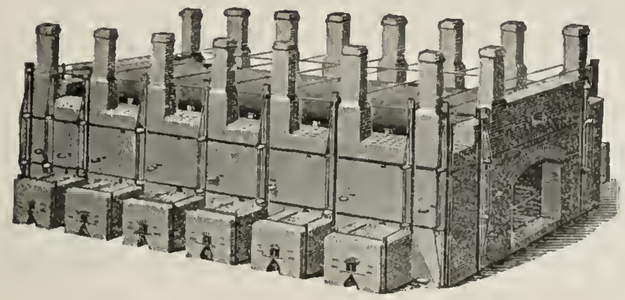
Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,

P. O. Box 335. ROME, GA., U. S. A.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.



These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

The Lehmann Portable Continuous Kiln,

And the Lehmann Slumming Apparatus

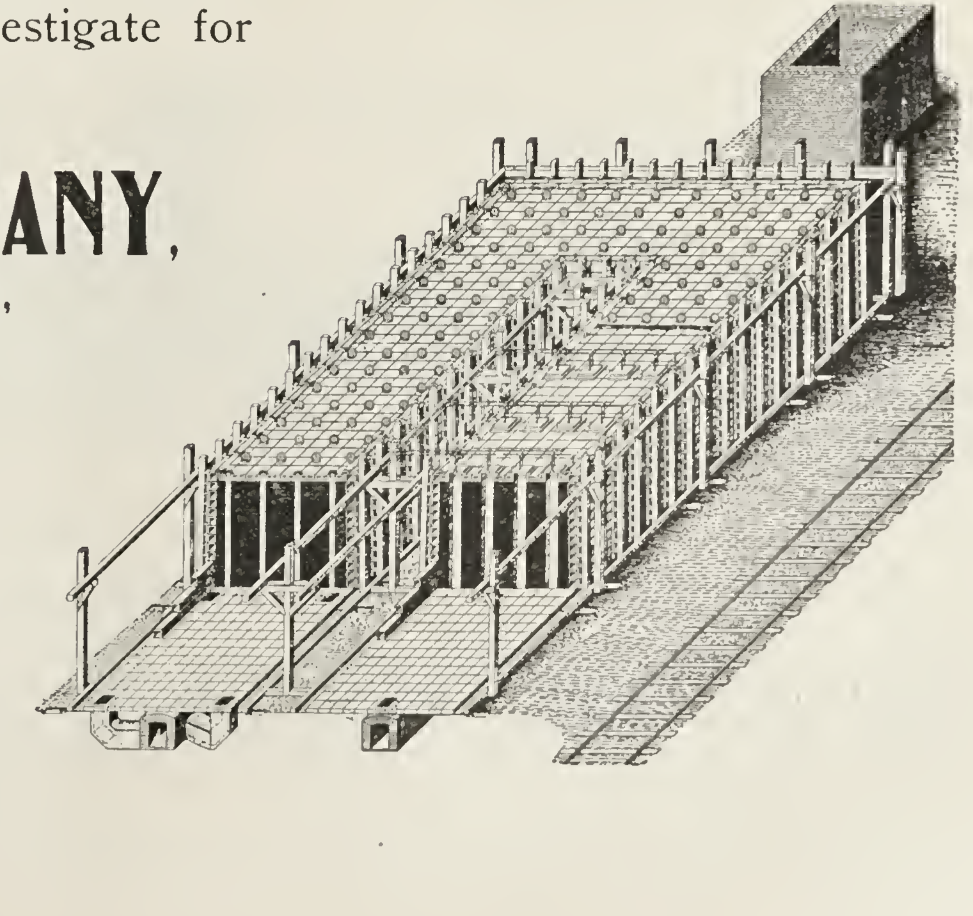
Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

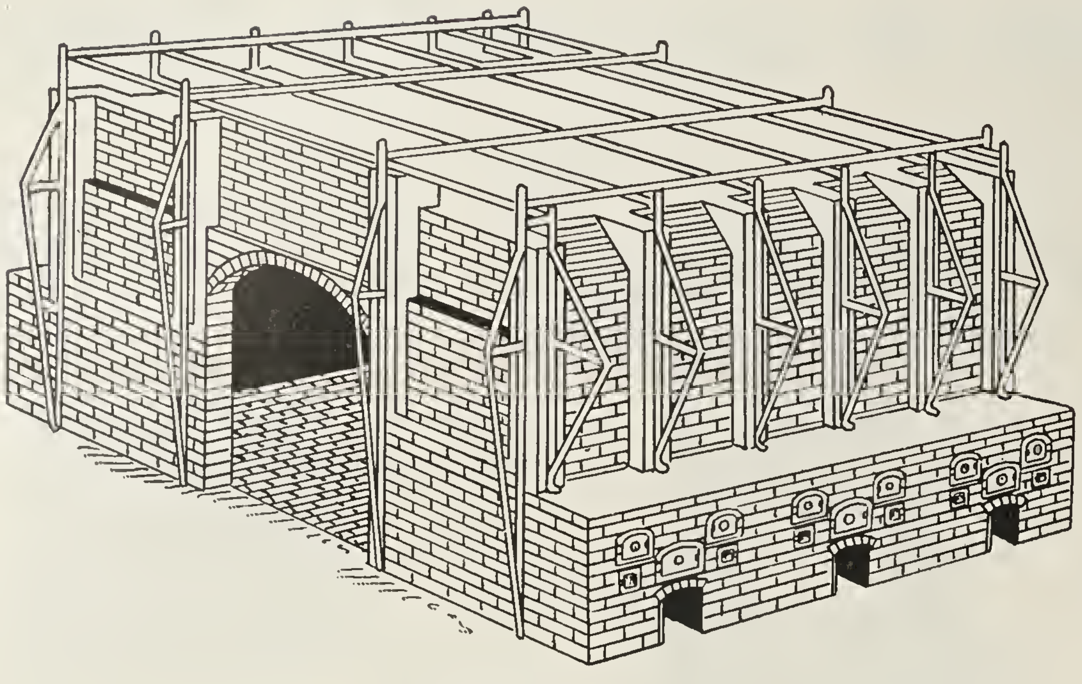
F. LEHMANN & COMPANY,

Foot of West Wellington Street,
CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers, Plans and estimates furnished for Brick, Lime and Cement Works. Practical tests made.

THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.





PATENTED.

The GRATH

IMPROVED
DOWN=DRAFT

BRICK KILN,

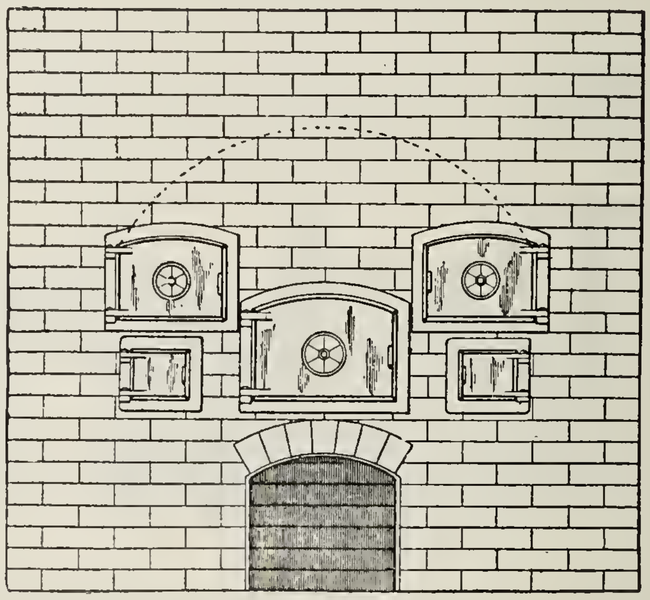
With the Grath Gas and Coking Furnaces attached will produce a larger percentage of Face or Vitrified brick, than any other kiln in the market.

Built any size wanted. Singly, in groups or on the Continuous System and will guarantee the results of over 90 per cent. first class Face or Vitrified Brick. Can also be used for Fire Brick, Sewer Pipe, Pottery, Porcelain or Terra Cotta.

The GRATH GAS and COKING FURNACE.

This is the **ONLY** Furnace which consumes all the fuel and black smoke producing as much heat from one ton **slack** as can be obtained from same amount and kind of lump in ordinary furnaces.

The **ONLY** furnace which heats the fuel in Coking Chamber from top and bottom and is therefore the best Furnace. All parties using this method will be prosecuted for infringement.



PATENTED.

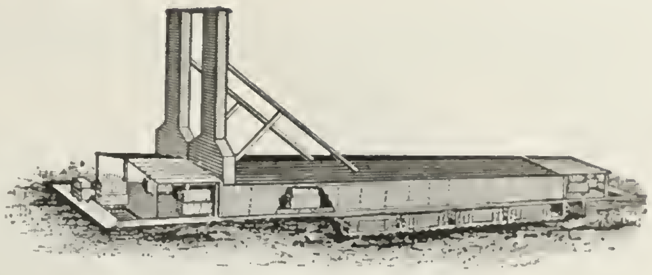
For grinding brick for arches we have the **best** devise in the market, no white sand required. Brick stays clean and it is in the reach of all as it is the cheapest process in the market.

Attention is called to the Grath Triple Pressure Hand Power Ornamental Press for making brick from dry clay. For Simplicity, Great Pressure and Durability, this Press has no equal and is within the reach of all, and is guaranteed in every respect to be the most perfect and most powerful Hand Power Press in the market.

FOR FURTHER PARTICULARS, ADDRESS

The ILLINOIS SUPPLY & CONSTRUCTION CO.,
St. Louis, Mo.

National Bank OR Coal Bank,



Chicago Iron Clad Dryer.

Is the Vital Question.

Chicago Brickmakers prefer depositing with the former. The accompanying letter from one of Chicago's leading brickmakers kindly offering the secret to all Brother Brickmakers seeking for light. A perusal of this letter will illuminate the fact that management and proper appliances determines which bank receives the deposit.

TELEPHONE MAIN 4132.

LABAHN BRICK CO.,
MANUFACTURERS OF
Building Brick.

YARD: Lansing, Ill., on Panhandle R. R.
Box 408, Builders' and Traders' Exchange.

OFFICE: 159 LaSalle Street, Room 97.

CHICAGO, February 1st, 1899.

MR. A. F. BARRON,
Successor to WOLFF DRYER Co., Chicago.

Dear Sir:—Your favor of January 30th, received. In replying to same, regret that I am unable to furnish you with the cost of fuel for drying our brick. Our steam power is so situated that we are unable to separate or divide it up so that the machinery and dryer could be run separately.

The best that I can do for you in this direction is to furnish the amount of steam power used to run our entire plant and fuel consumed for generating steam and burning brick.

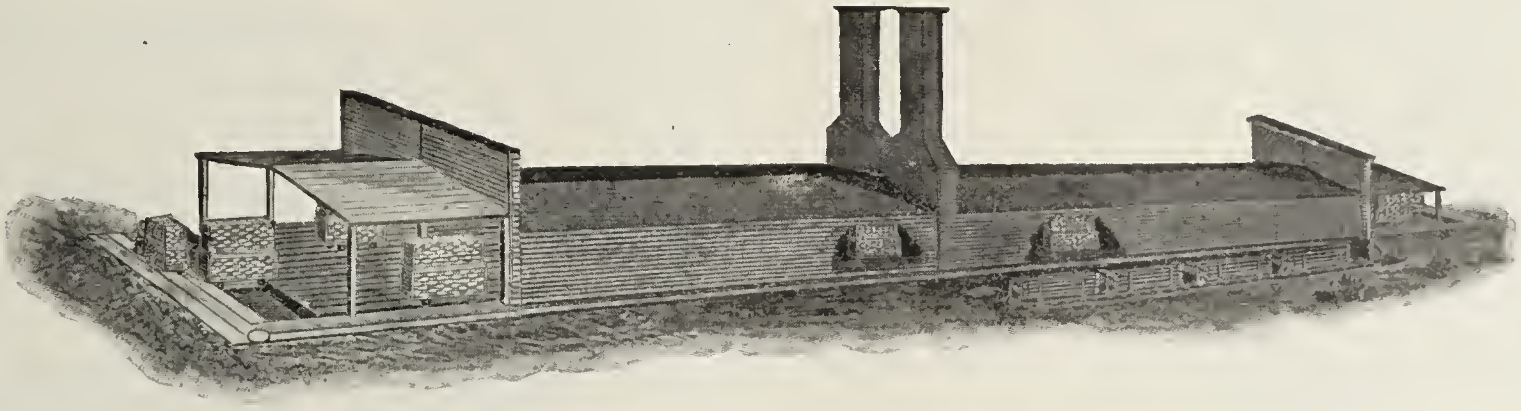
The capacity of our plant averages one hundred and thirty-five thousand (135,000) per day in the years business.

The entire plant in run economically with three boilers, 125 horse power each. These boilers furnish the necessary steam required to run all machinery for making the brick, and likewise supplying the live steam which runs the dry house, drying our entire output, and all other purposes where steam is used about the premises. We are using Brazil block (soft coal) for generating steam, and this coal and wood for firing the kilns. The average cost per thousand for the entire product is seventy cents, for making, drying and burning. Our dry house has been in active service for the past six years. Since adding your improvements three years ago, in order to meet the increased capacity of our machinery, it has responded to all demands upon it Winter and Summer without diminution of capacity or perceptible difference in consumption of fuel. It is therefore needless to say that we are well pleased, and in fact should be more than satisfied, as the dryer turns out fifty per cent more brick than your contract specified.

Possibly these statistics may be of value to some brother brickmaker and yourself personally. We would therefore say to you that our plant and our books are open and free for inspection by all brickmakers seeking for light upon this important subject.

The foregoing is a just tribute to the merits of your Iron Clad Dry House and honorable methods of carrying out agreements. Our dry house is a four tunnel, sixteen track dryer, 112 feet long.

Yours very truly,
LABAHN BRICK CO.
John F. Labahn, President.

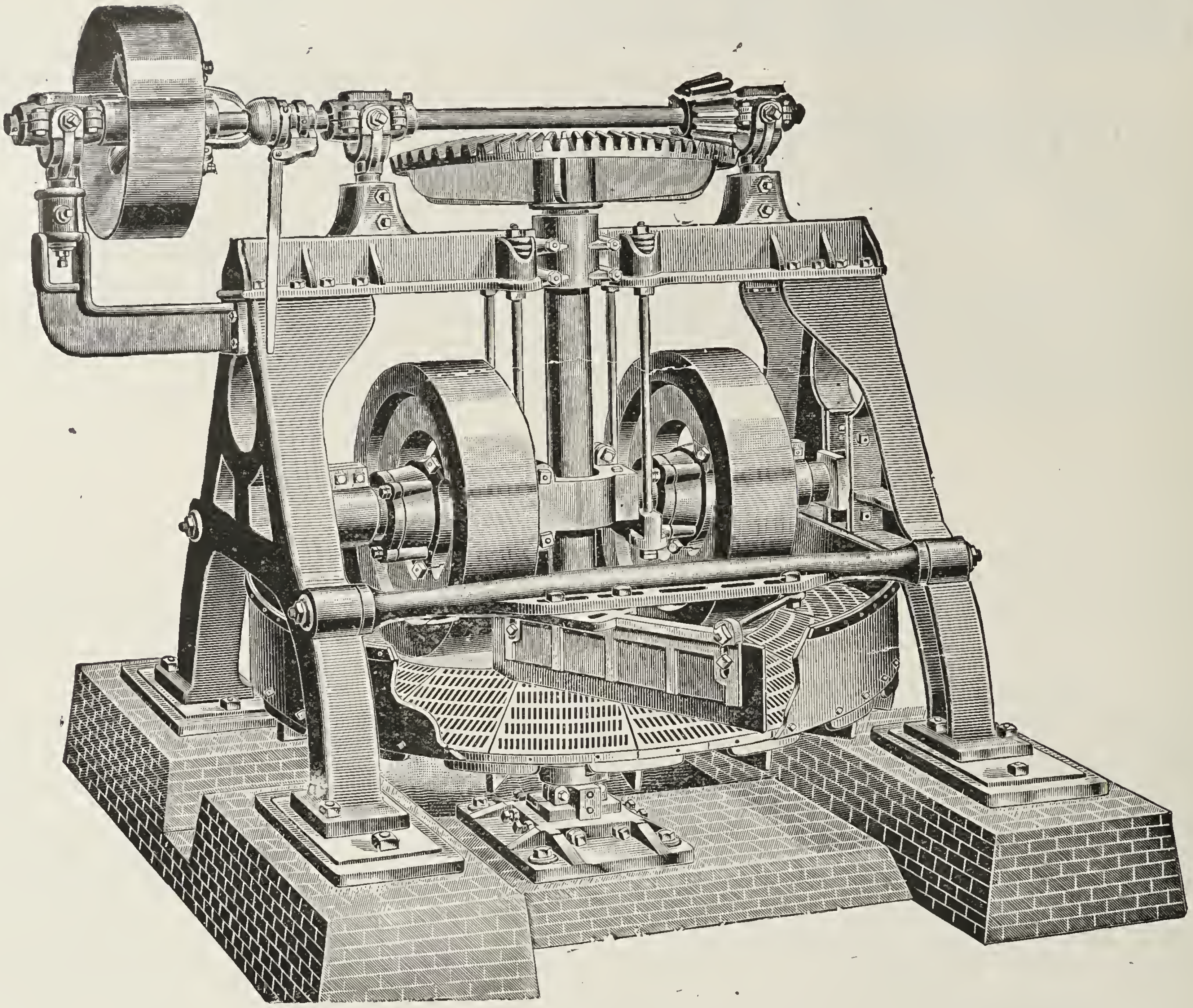


THE BARRON TENDER CLAY DRYER.

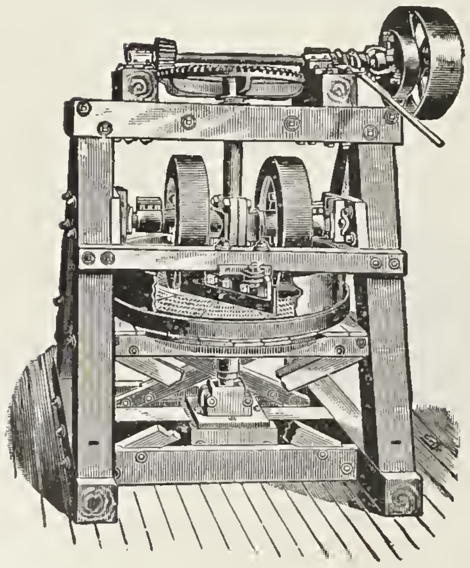
We build dryers to meet the peculiarities of the various clays. Innformation furnished.

A. F. BARRON,

Successor to WOLFF DRYER CO.,
Room 303, 358 Dearborn Street, CHICAGO, ILL.

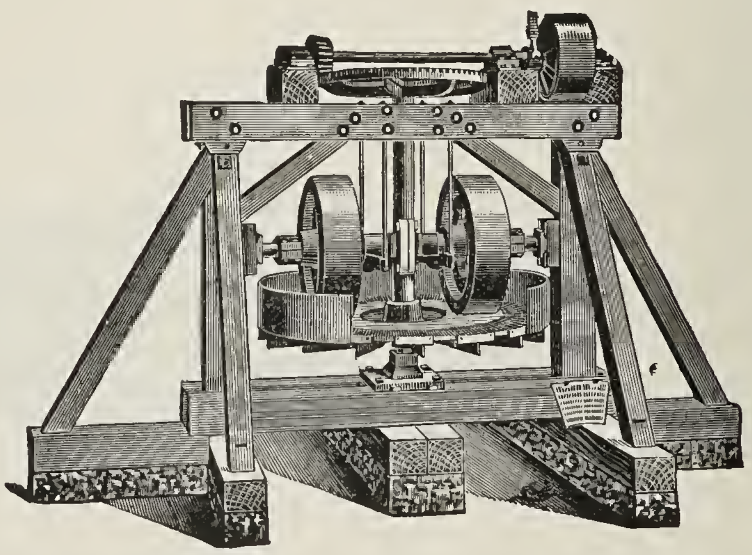


OUR SPECIALTY IS **DRY PANS.**



IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



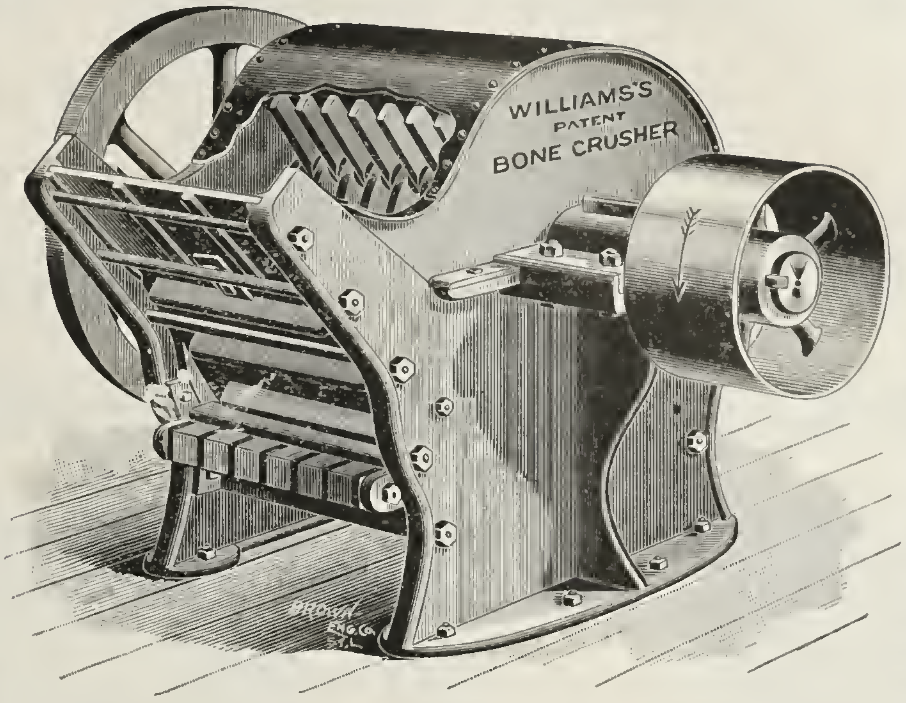
......SEND FOR NEW ILLUSTRATED CATALOGUE......

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.

The Williams Patent Crusher & Pulverizer Company,

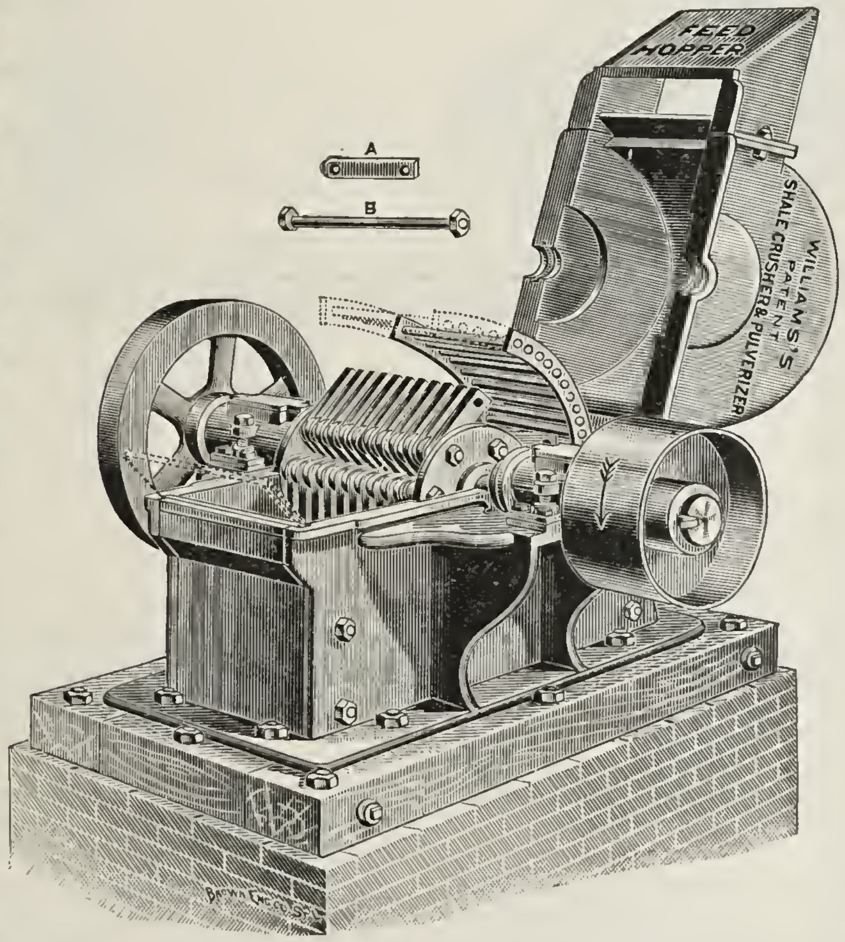
OF

ST. LOUIS, MO., U. S. A.



Williams's Shale Breaker.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output. . . . . . .



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

FOR FURTHER INFORMATION
WRITE TO

The Williams
Patent
Crusher &
Pulverizer
Company,

ST. LOUIS, MO.,
U. S. A.

STEVENSON & CO.,

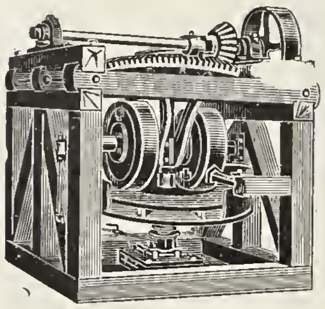
WELLSVILLE,
OHIO, U. S. A.

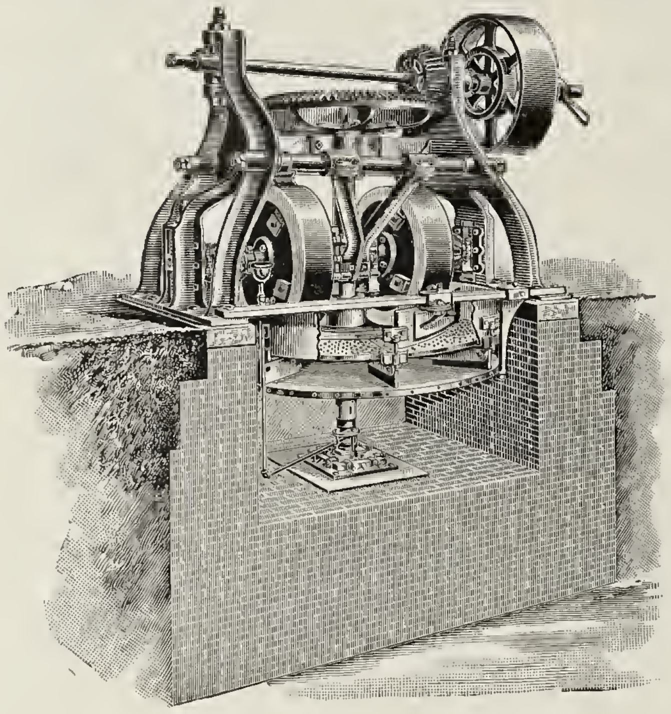
MANUFACTURERS OF

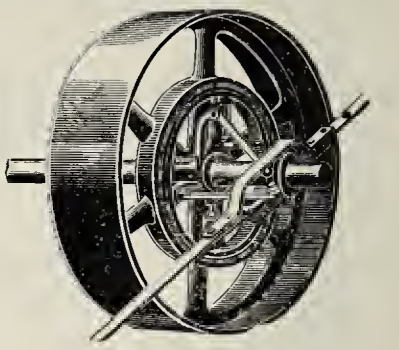
Brick Machinery.

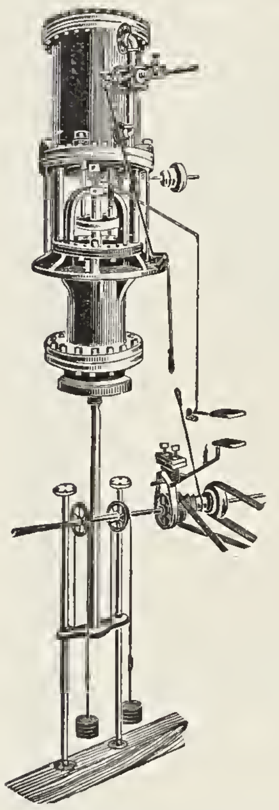
COMPLETE EQUIPMENTS.

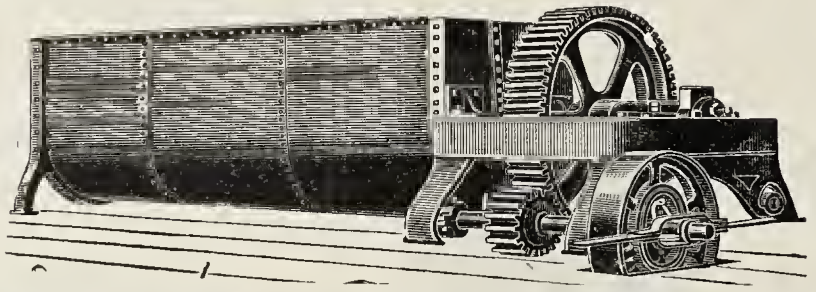
Tile Machinery

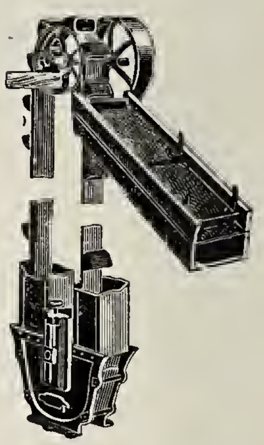












Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

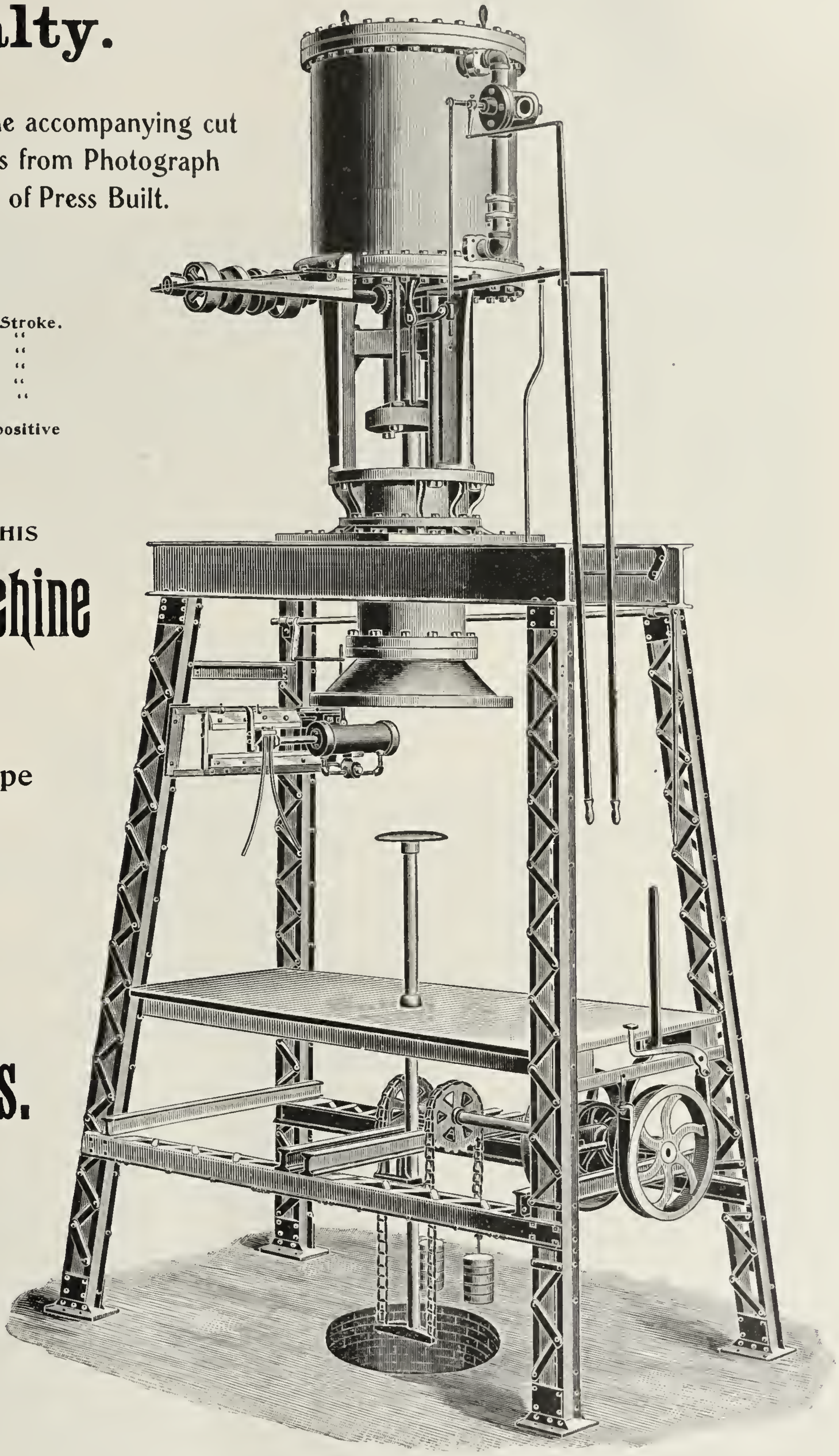
STEVENSON & CO., Wellsville, Ohio.

SEWER PIPE AND TILE MACHINERY,

Our Specialty.

The First Machine of this Type was manufactured for Montague & Co., Chattanooga, Tenn., November 1897. . .

The accompanying cut is from Photograph of Press Built.



DURING THE PRESENT YEAR
WE HAVE BUILT THESE SIZES:

44	in. Steam Cylinder,	20	in. Clay Cylinder,	42	in. Stroke.
44	" "	20	" "	50	"
48	" "	22	" "	48	"
48	" "	24	" "	48	"
52	" "	24	" "	48	"
52	" "	26	" "	60	"

All the above are in successful operation and are positive witnesses of their Excellence.

◆

WRITE US FOR DESCRIPTION OF THIS

Strictly Up-to-Date Machine

◆

To make the Most Pipe
—AND—
To make the Best Pipe

BUY THIS MACHINE
OUR DIES. . . . .

◆

LET US TELL YOU OF OUR

Steele Frame,
Ball=Bearing

DRY AND WET PANS.

DON'T EXPERIMENT
WITH UNTRIED MACHINES.

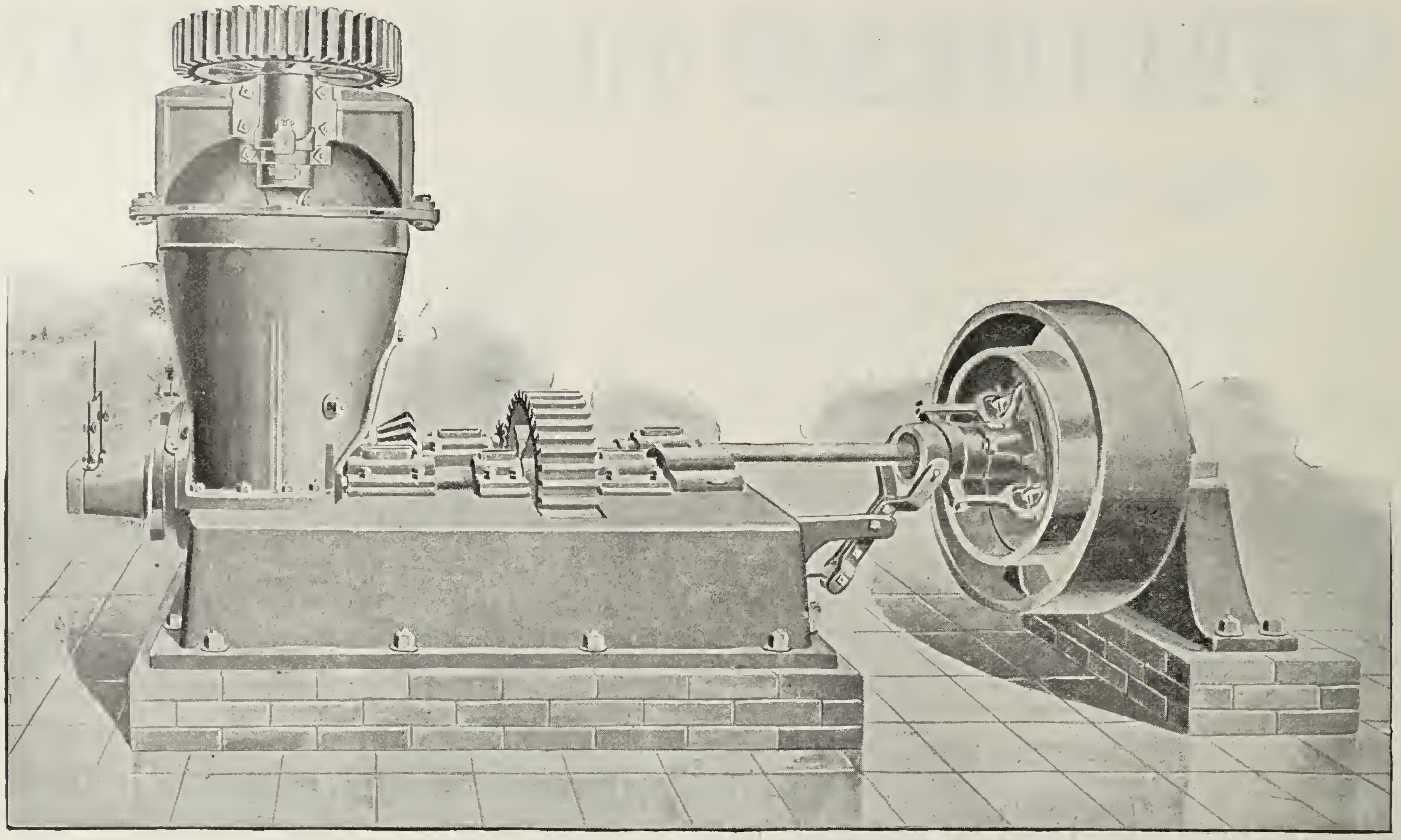
"Be Sure You're Right, then Go Ahead."

◆

Our Pottery Machinery
Is Unequalled.

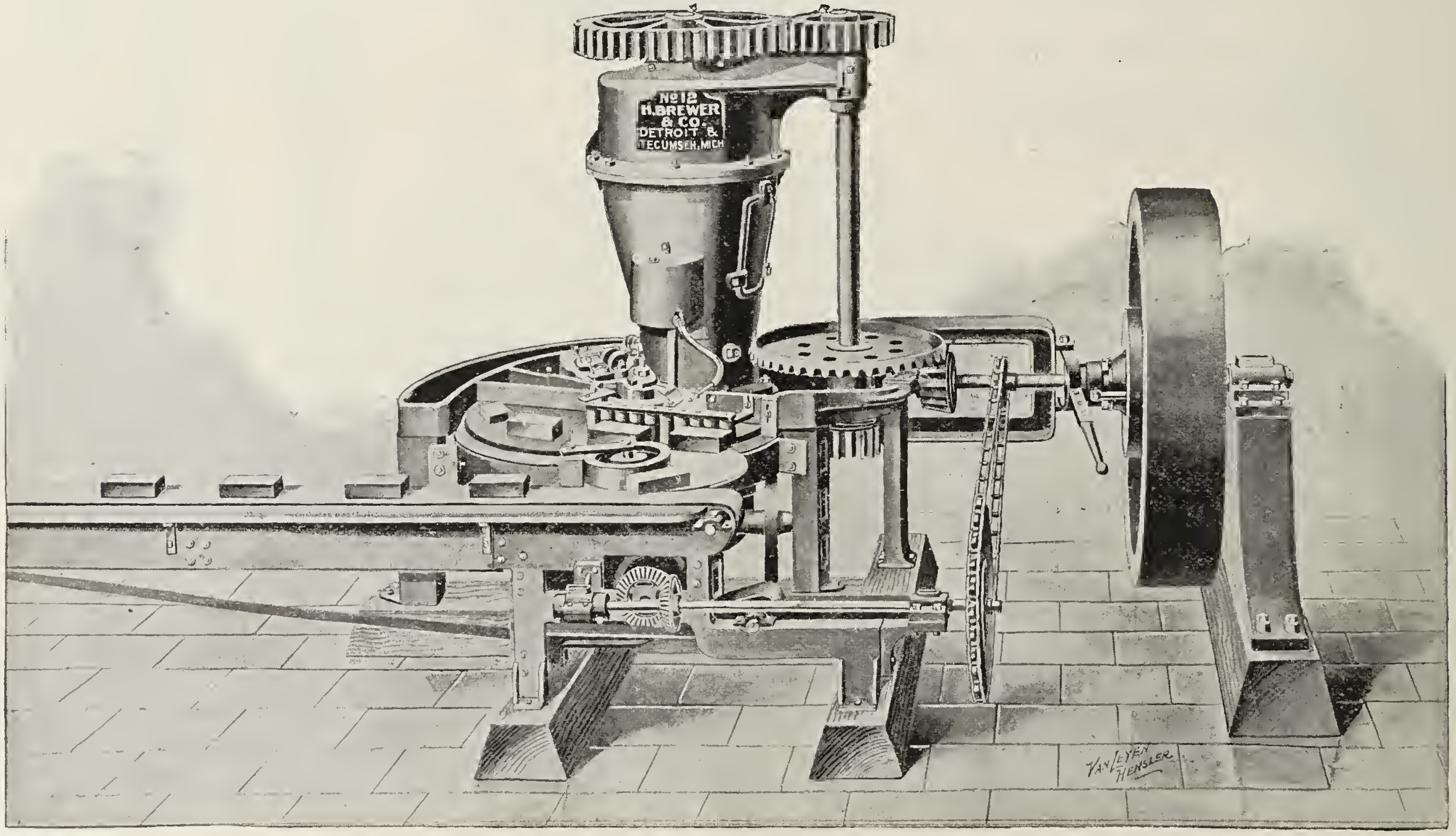
MANUFACTURED BY

TAPLIN, RICE & CO., AKRON, ...OHIO.



Brewer No. 10.

Daily capacity 40,000 to 50,000 Standard size Brick.



No. 12 Mold Press Brick Machine.

Daily capacity 40,000 to 50,000 Standard size Brick.

H. BREWER & CO., Tecumseh, Mich.

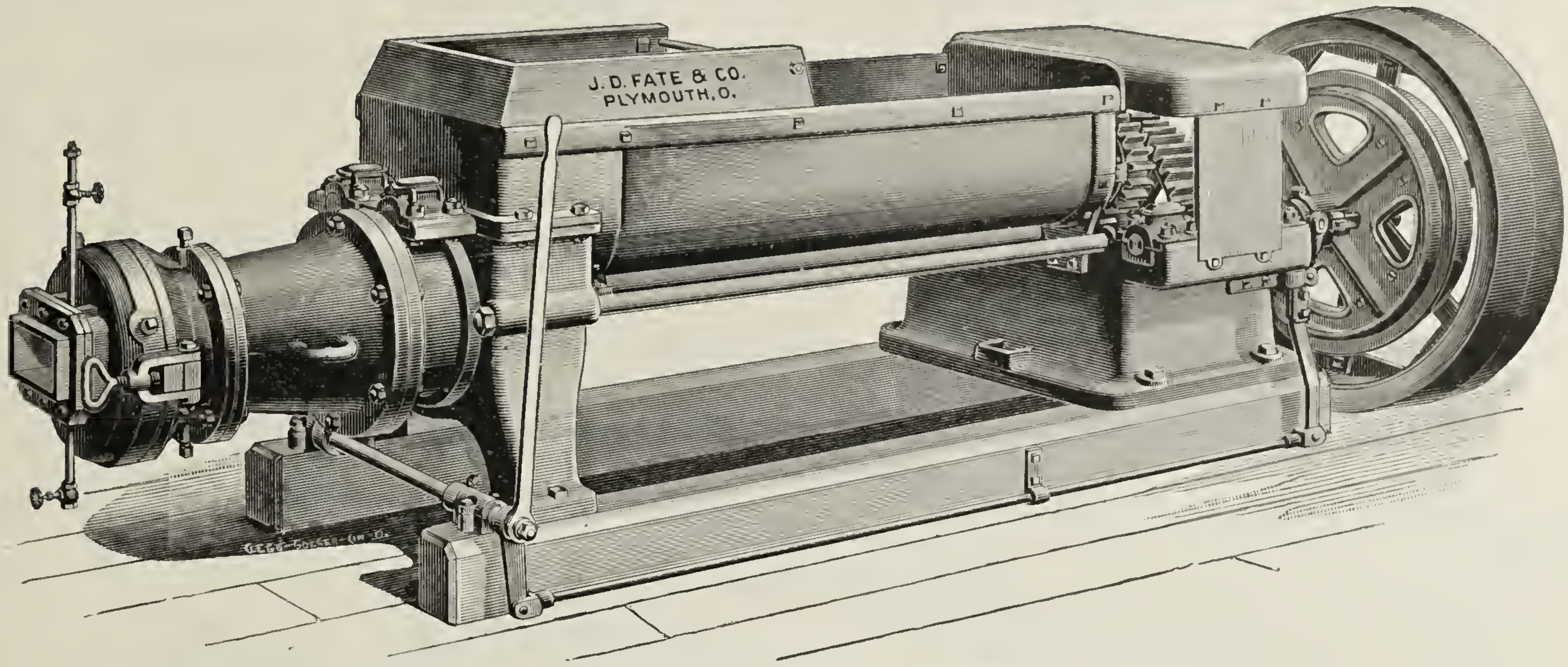
J. D. FATE & CO.,

Manufacturers of

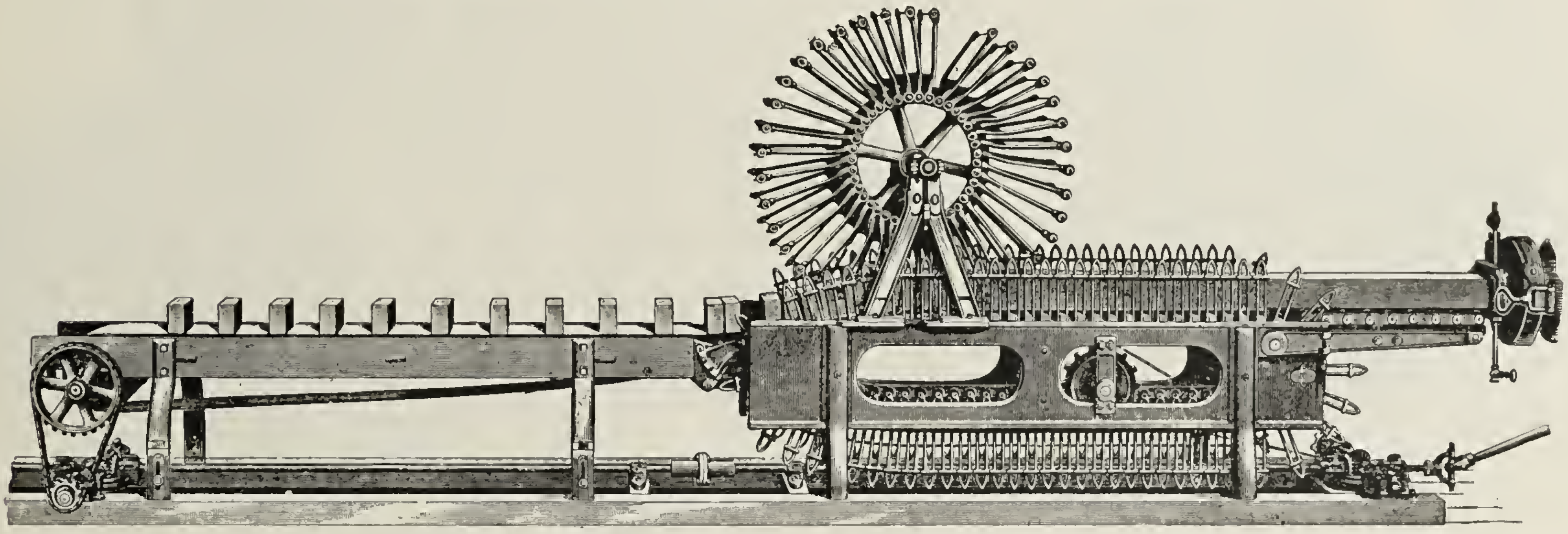
BRICK AND TILE MACHINERY.

PLYMOUTH, OHIO.

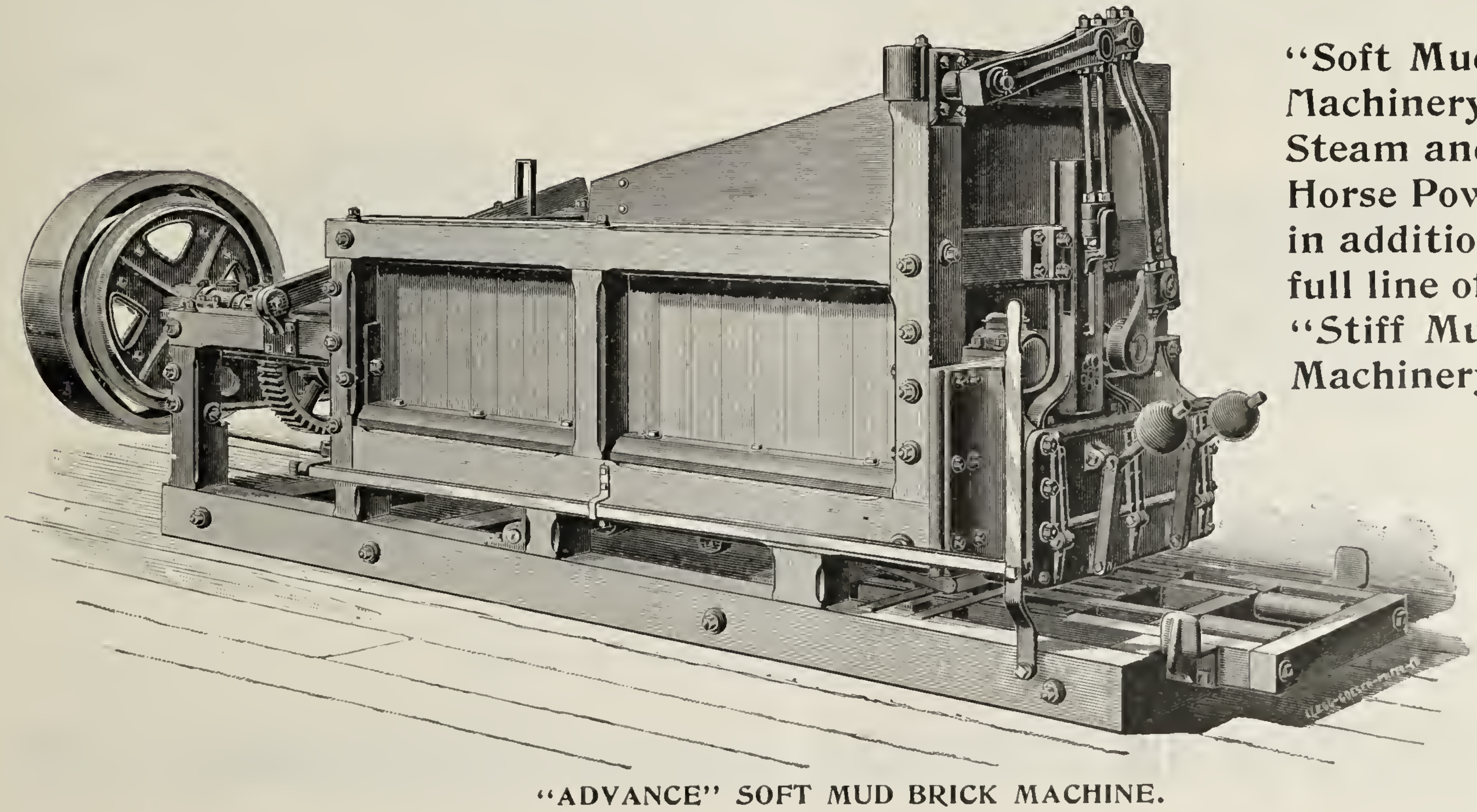
Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.


J. D. FATE & CO.
PLYMOUTH, O.

"HUMMER" COMBINED PUG MILL AND BRICK MACHINE.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.



"ADVANCE" SOFT MUD BRICK MACHINE.

"Soft Mud" Brick Machinery, both Steam and Horse Power in addition to our full line of "Stiff Mud" Machinery.

• •

ASK FOR CATALOGUE AND PRICES.

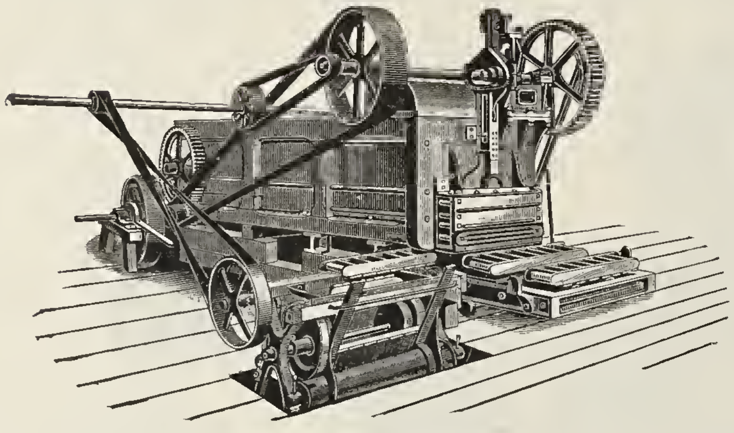
• •

DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the best, namely,

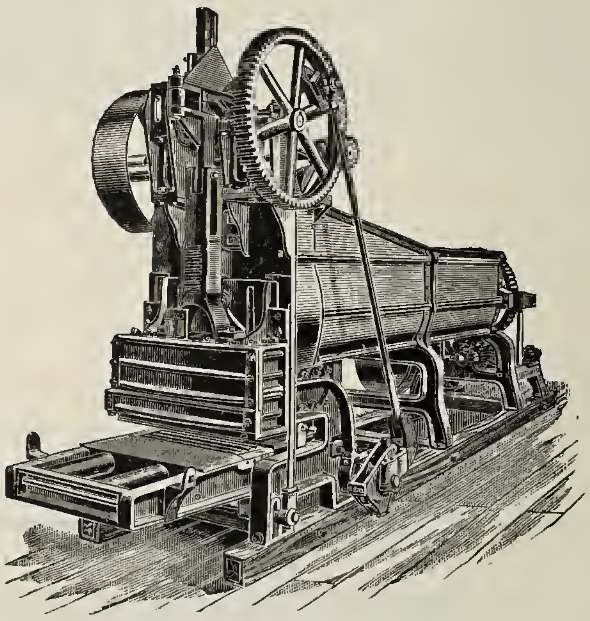
··THE··
POTTS Horizontal Stock Brick Machine

They do all Claimed for Them. You take no chances of an Experiment.



Wood Pug Mill.

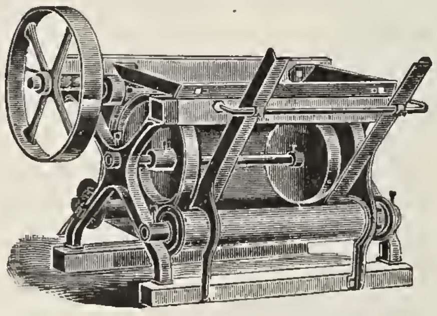
They have no equal for making Brick which have Clean, Sharp Corners and Smooth Surfaces.



Iron Frame Pug Mill.

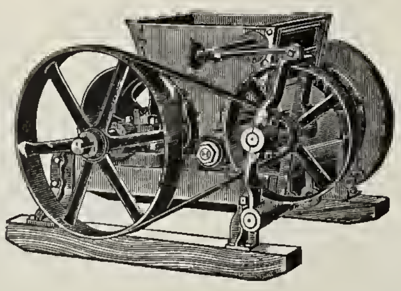
They are the only machines which will work the clay direct from the bank without the use of an extra Pug Mill.

They are **Simple in Construction, Strong and Durable.** Every machine guaranteed to do as claimed for it.



Mould Sanders,

Which have no equal for sanding the moulds, no light complicated parts to wear or break. They do not waste or spill the sand. Guaranteed to do all claimed for them.



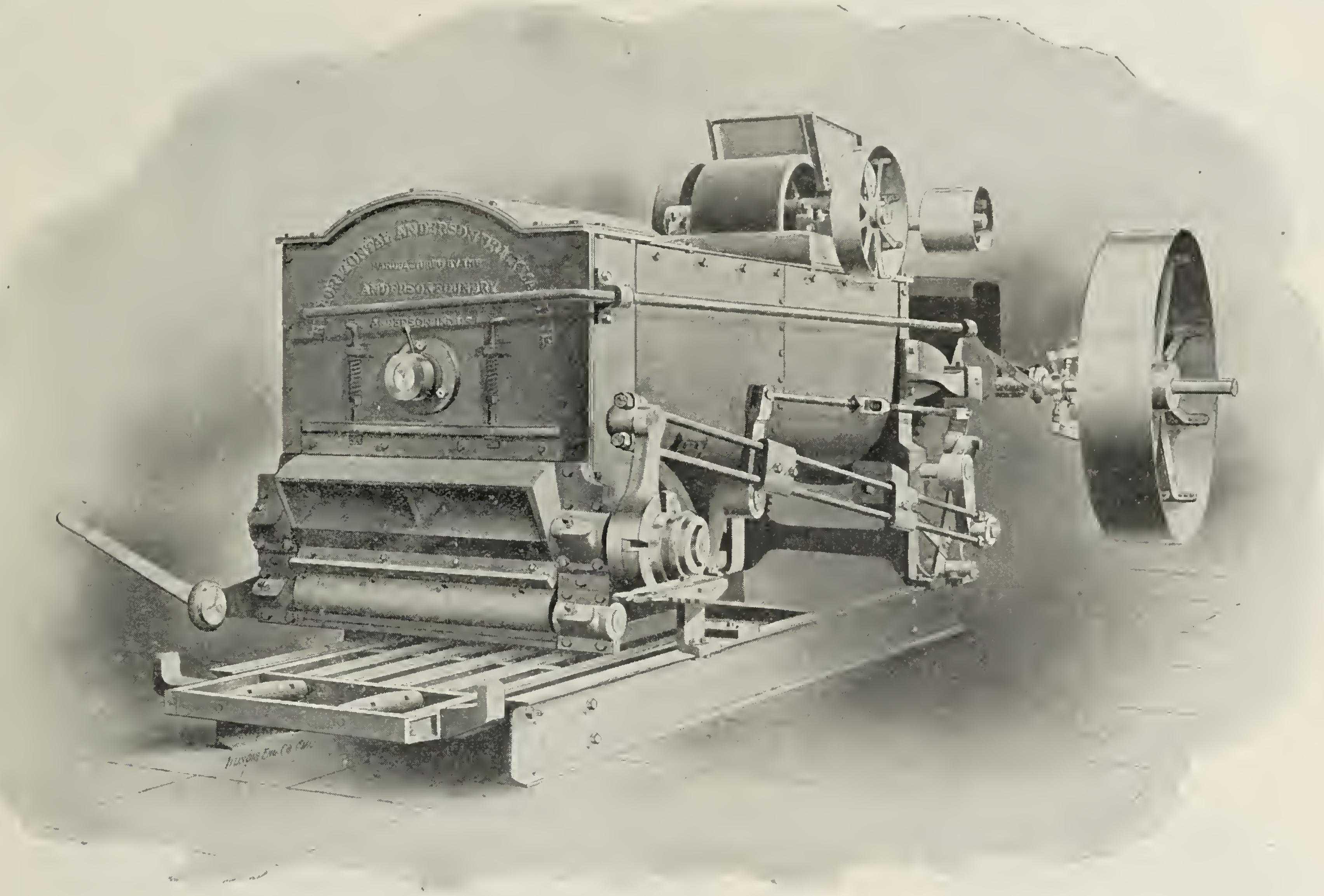
Disintegrators,

Built of good material, strong and durable. They do the work claimed for them, built in a number of sizes to suit any yard.

For terms and prices of anything needed on the brickyard write

C. & A. POTTS & CO., 814 to 824 W. Wash. St., **INDIANAPOLIS, IND.**

Combined Horizontal Anderson Brick Machine and Disintegrator.



Manufactured by

The Anderson Foundry
and Machine Works,

ANDERSON, INDIANA.

We Lead! Others Follow!

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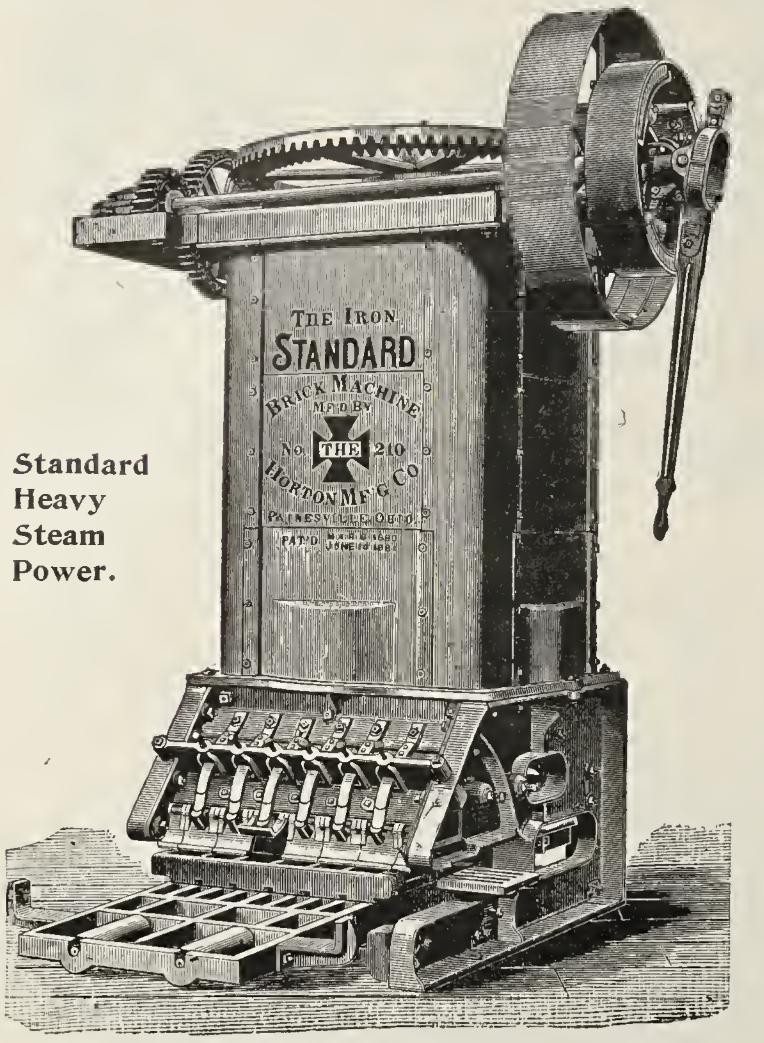


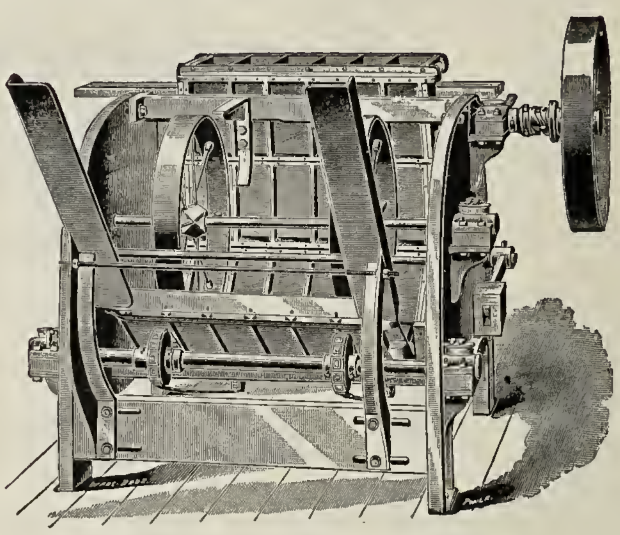
Standard
Heavy
Steam
Power.

The Hercules!

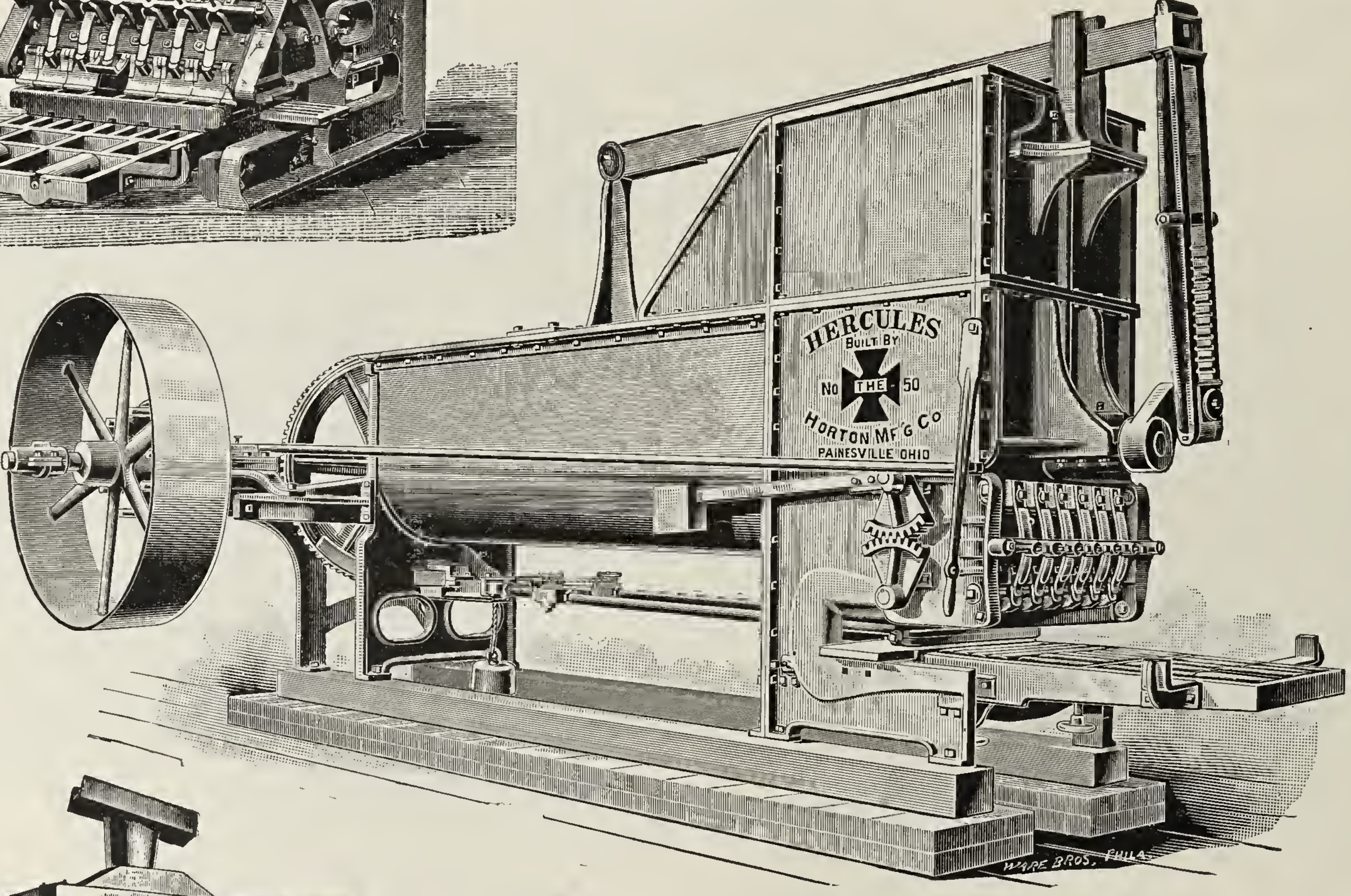
Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

The Standard Machine is just what its name implies.

SEND FOR
1899 CATALOGUE.



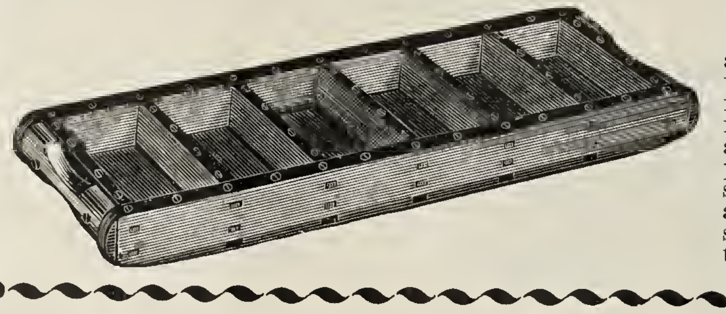
HORTON MOLD SANDER DIRECT FEED.



Hercules capacity 40,000
to 50,000.
Weight 15,000 pounds.

We are making a special drive on Molds this season. Send for our new circular on molds.

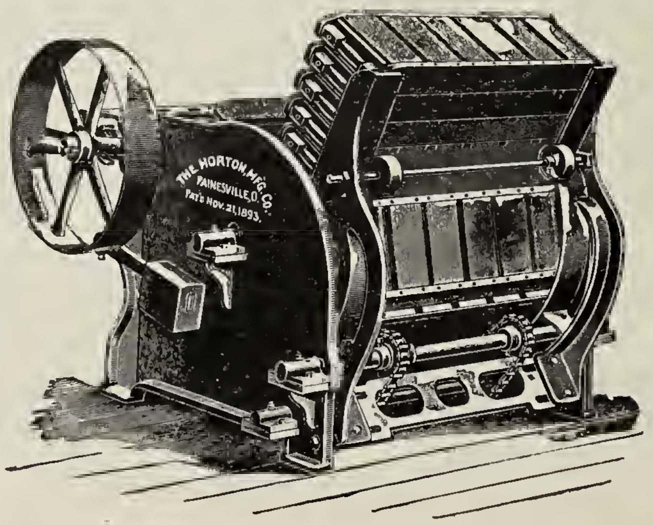
IRON STANDARD HORSE POWER.



WE HAVE recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE,
——OHIO.


The Horton Mf'g Co.
Painesville, O.
Pat'd Nov. 21, 1893.

THE AUTOMATIC FEED MOLD SANDER.

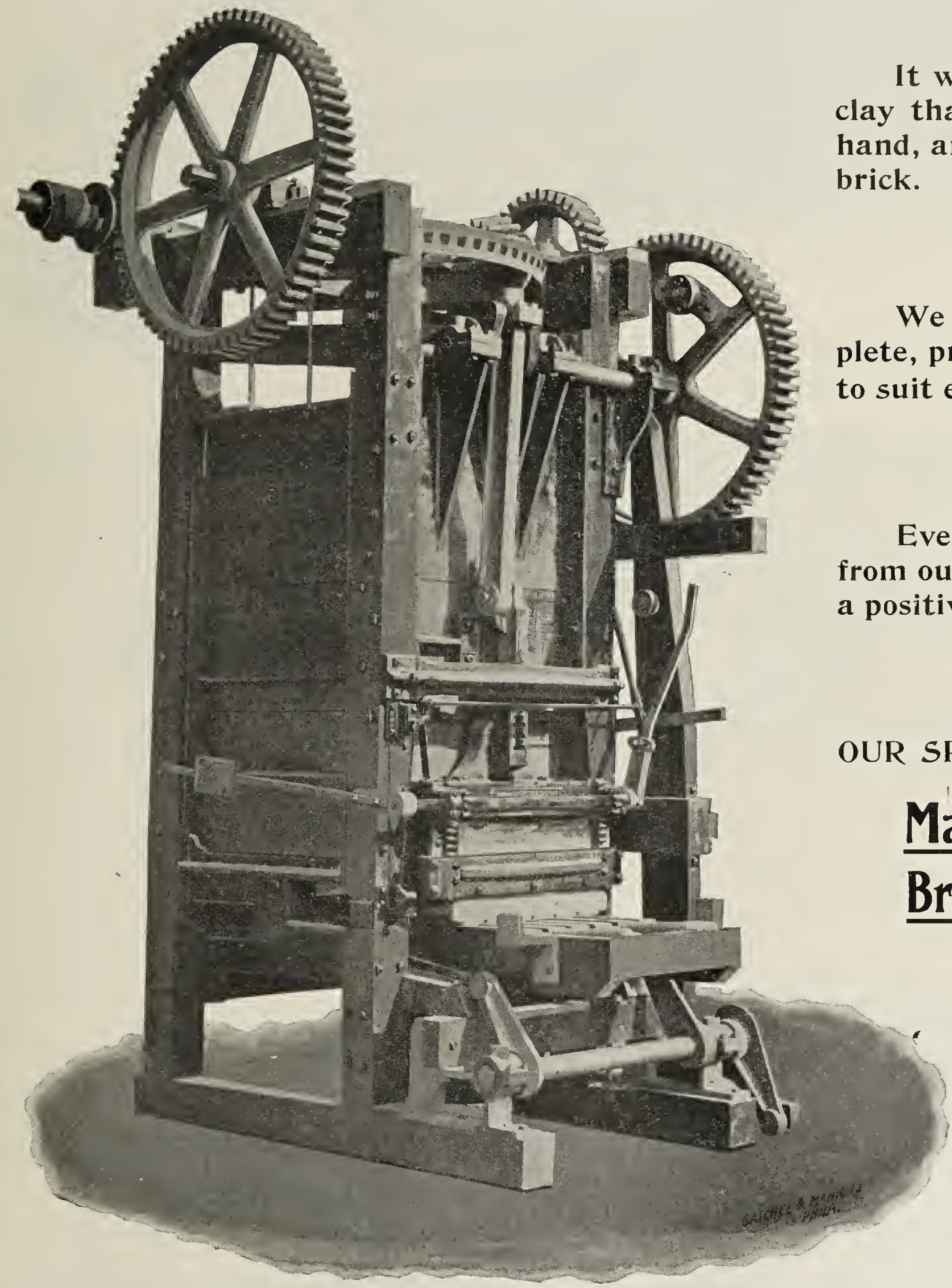
1857-1899.

THE

"Martin" Brick Machinery

STANDS UNEQUALLED FOR

Simplicity, Strength and Durability.



It will work any kind of clay that can be worked by hand, and turn out a perfect brick.

* * * *

We equip plants complete, preparing special plans to suit each need.

* * * *

Every machine shipped from our factory is sold under a positive guarantee.

* * * *

OUR SPECIALTY

Machine Brick Moulds.

* * * *

All Inquiries
have prompt
and careful
attention.

* * * *

Send for General Catalogue. Mentioning anything you need.

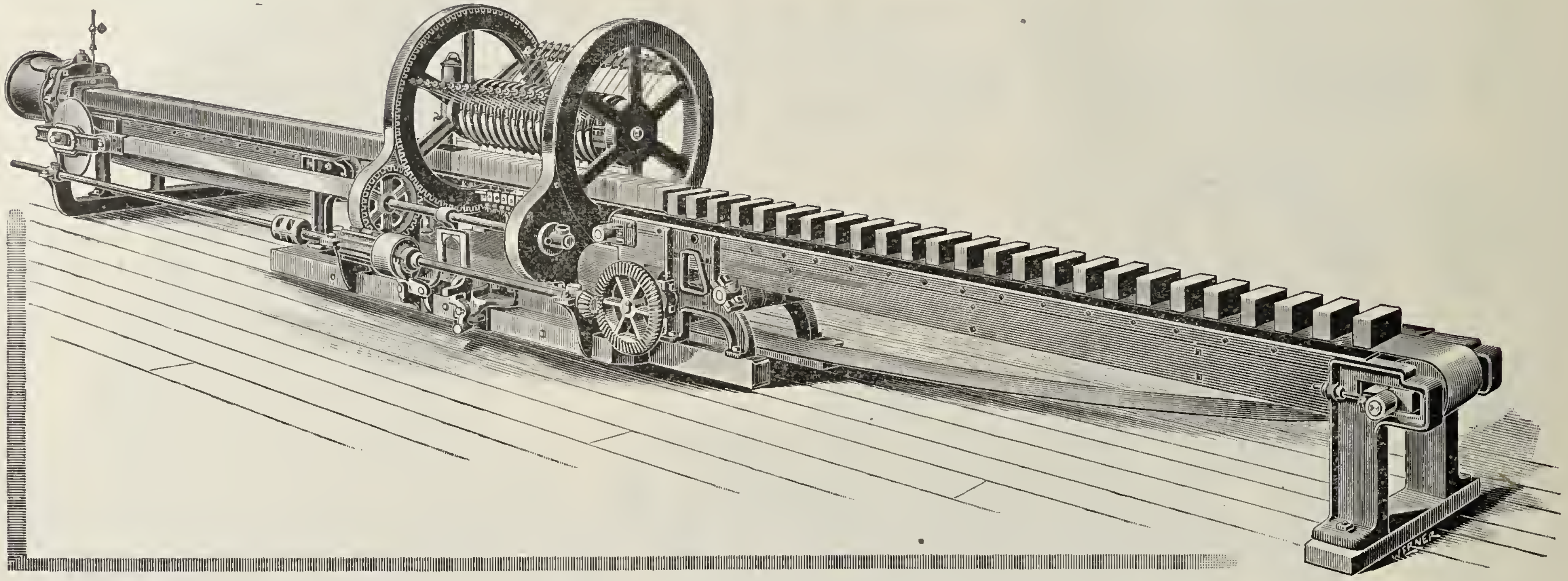
THE HENRY MARTIN BRICK MACHINE MFG. CO.,

INCORPORATED.

LANCASTER, PA., U. S. A.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



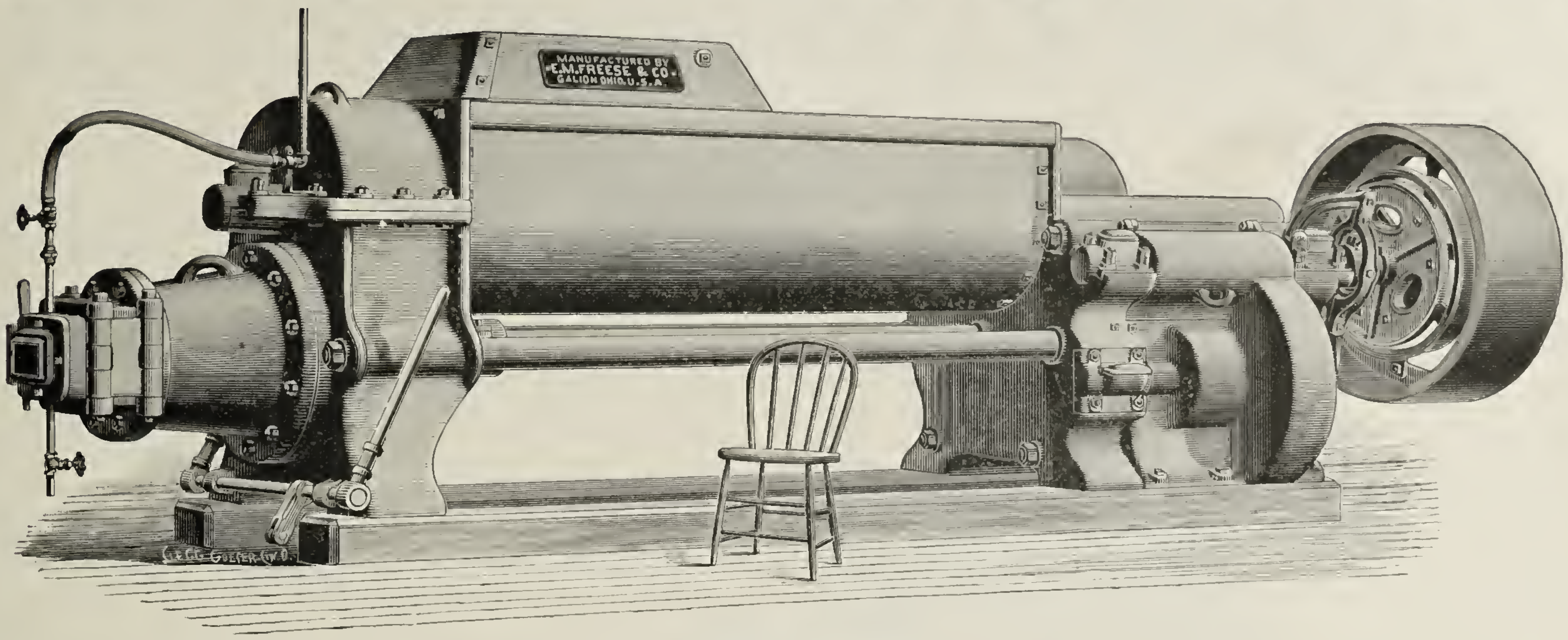
A New Rotating Cutter for Side Cut Brick.

POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick.
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

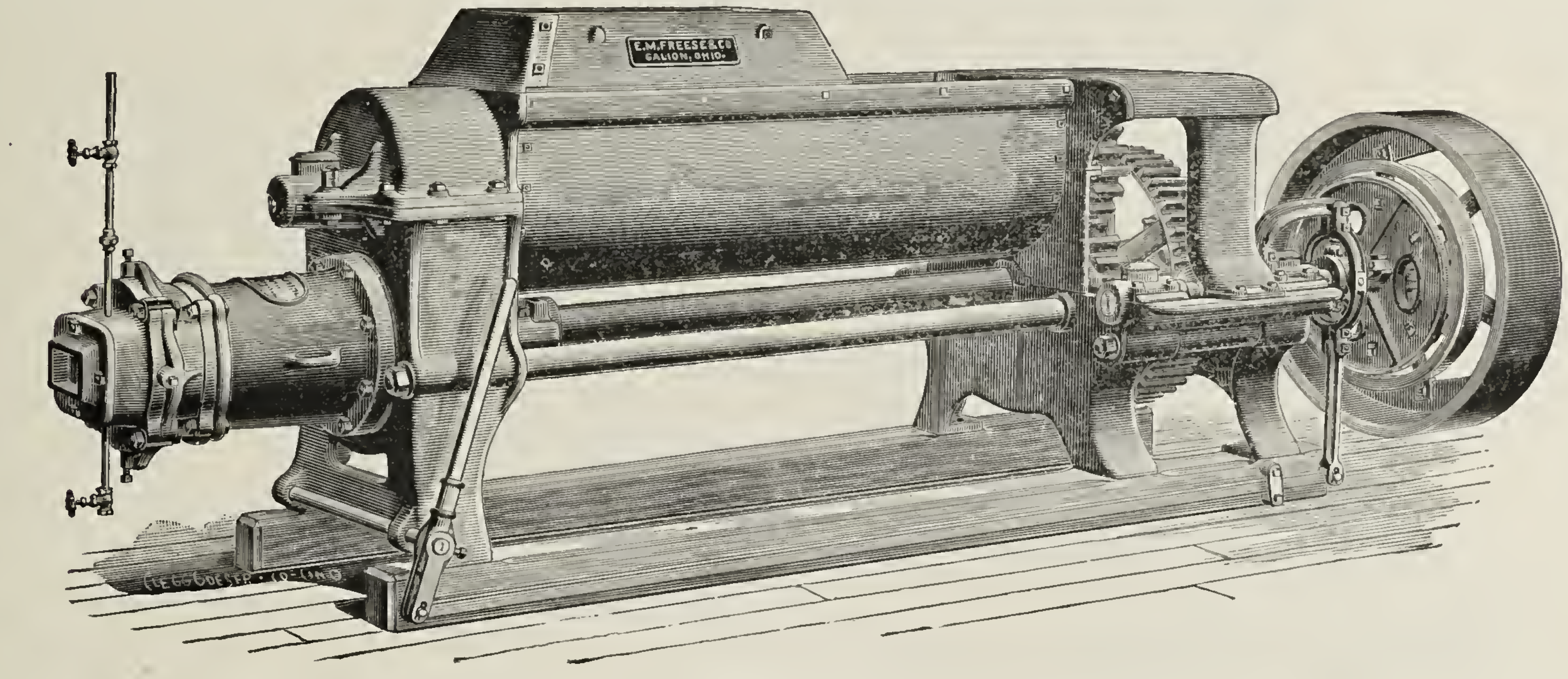
E. M. FREESE & CO.,
Galion, Ohio.

The Original Union Brick Machines


MANUFACTURED BY
E.M.FREESE & CO.
GALION OHIO U.S.A.

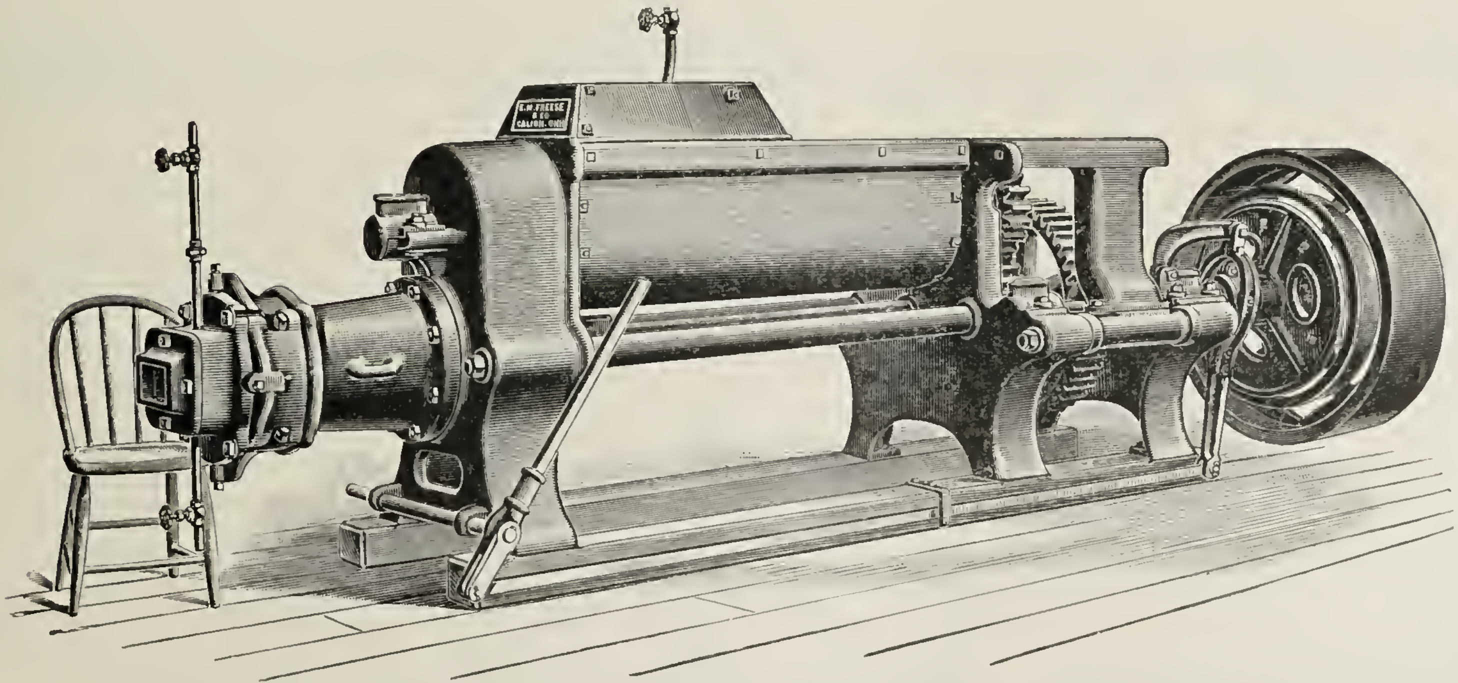
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.


E.M.FREESE & CO.
GALION, OHIO.

No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

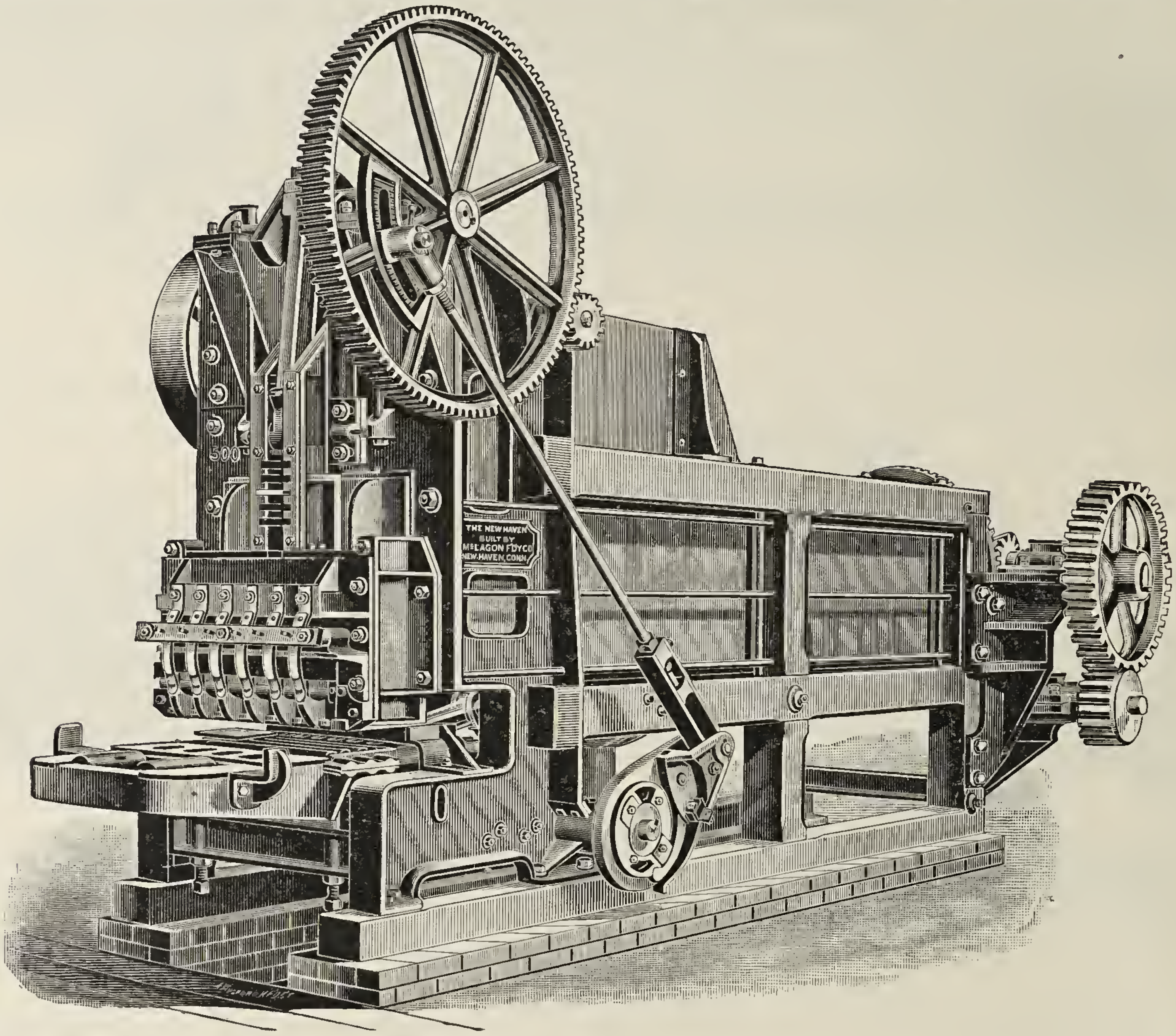
No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

First Machine Nine Years Old, Second Machine Four Years Old.

REPAIRS LESS THIS YEAR THAN FOR PAST THREE YEARS.



Westfield, Mass., Oct. 13, 1898.

The Eastern Machinery Co., New Haven, Conn.

Gentlemen—Our machines have given excellent satisfaction this season, and **the amount expended for repairs has been less than for the past three years.** We can only repeat what we have said many times before. In our opinion your machines are the best on the market. Yours truly, WESTFIELD BRICK CO.

This shows how well they wear. They will serve you just as well.

The Eastern Machinery Co.,

NEW HAVEN, CONN.

Mention the Clay-Worker

DO YOU WANT THE

BEST BRICK DRYER?

THE CUMMER DRYERS

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel, It is a fuel saver and hence a money maker.

If you want the best and most economical brick dryer don't fail to get our prices. If you want a cheap dryer, its no use to write us for we don't build that kind.

* * *

Read what H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE: 60TH AND HAVERFORD STS. TELEPHONE 147, W. P.

H. C. CARROLL & SONS,

Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS:
57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

* * *

The Cummer Clay Dryer is now in successful operation at many places in the United States. Like our brick dryer it is fully guaranteed to perform its work in the most effective manner possible and in any desired capacity. The **Cummer Dryer** succeeds where others fail. It will afford us pleasure to demonstrate its superiority over all other dryers.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell you troubles to"

The F. D. CUMMER & SON CO.,

CLEVELAND, OHIO.

An "A. B. C." Brick Dryer

AMERICAN BLOWER CO
HEATING AND VENTILATING ENGINEERS
MANUFACTURERS OF FANS · BLOWERS HOT-BLAST APPARATUS
NEW YORK
DETROIT
LONDON

Send for Catalogue.

WILL SOLVE YOUR DIFFICULTY.

Have you been drying bricks on racks in the open air and found it necessary to shut down for dry bricks, when the sun refused to shine? Have you gone to the yard in the morning and found the racks collapsed and two or three days' run of half dried bricks all mixed up in the debris and spoiled?

Have you ever moved a lot of pallets of green bricks to the north side of the racks because the south wind was beating the rain in on them, and after you had done this, did the wind change to north just about dark?

Possibly you have a dryer that was guaranteed to dry a certain number of bricks every day, and you can only make it dry half that number.

Perhaps your bricks are costing too much to make, your competitor is cutting prices, and you can't see how he can do it.

Perhaps the world looks dark to you for one or more of these reasons.

We can help you. We have helped others. Why! Their names would fill this page.

Can we serve you?

American Blower Company,
DETROIT, MICH.

The Peerless System

UP-DRAFT, DOWN-DRAFT and CONTINUOUS KILNS

Is the Acme of Perfection in Brick Burning.

Read What They Say About It.

LaPRAIRIE PRESSED BRICK AND TERRA COTTA CO., Quebec.

"We have been using two of these rebuilt Kilns for the last two years, and the fact that we are now reconstructing another, DEMONSTRATES our ENTIRE SATISFACTION WITH YOUR PEERLESS SYSTEM."

ELMSDALE BRICK CO., N. S.

"Never saw a Kiln work so EVEN and FREE both in watersmoking and burning in all my life. The arches WERE AS GOOD as any other part of the Kiln."

JOHN CUBBINS SONS, Memphis, Tenn.

"After burning the first kiln that was changed, the second time, WE FOUND THE IMPROVEMENT SO GREAT and SO MUCH SUPERIOR to the old up-draft Kilns, that we are now changing our entire system to your PEERLESS PATENT."

JACOB KLINE, Baltimore, Md.

"Your system of burning GOOD HARD BRICK is without doubt THE BEST I have ever seen."

And There are Others.

No matter what you manufacture, or the capacity of your plant, if you make is of clay and want it burned write us for information. If you have kilns that are not giving satisfaction, or from any other cause you cannot burn your ware, write and tell us all you know about the trouble.

J. W. CARSON, Construction Engineer of Brick Works. **LaPrairie, P. Q.**

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THE CLAY WORKER
A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS.
INCLUDING BRICK TILE TERRA-COTTA SEWER PIPE POTTERY ETC.
T. A. RANDALL & CO. PUBLISHERS.
CHANDLER SC. INDPLS.

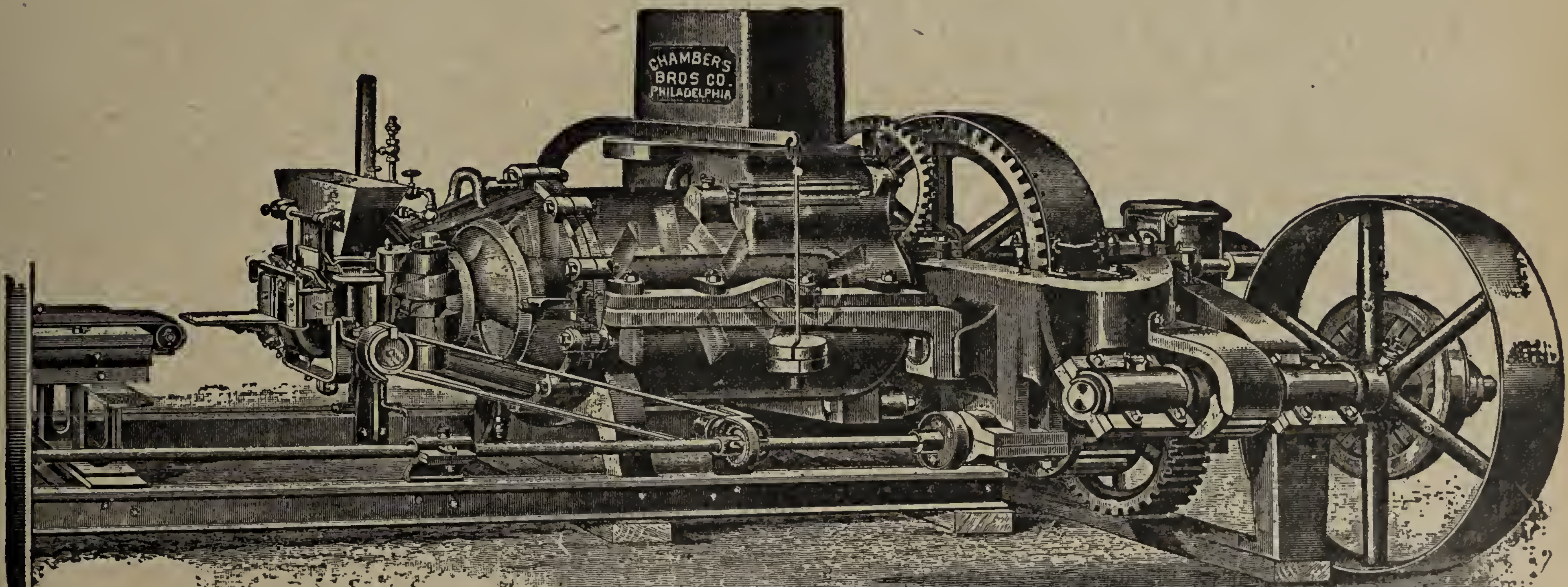
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXI, No. 5. INDIANAPOLIS, IND., MAY, 1899. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



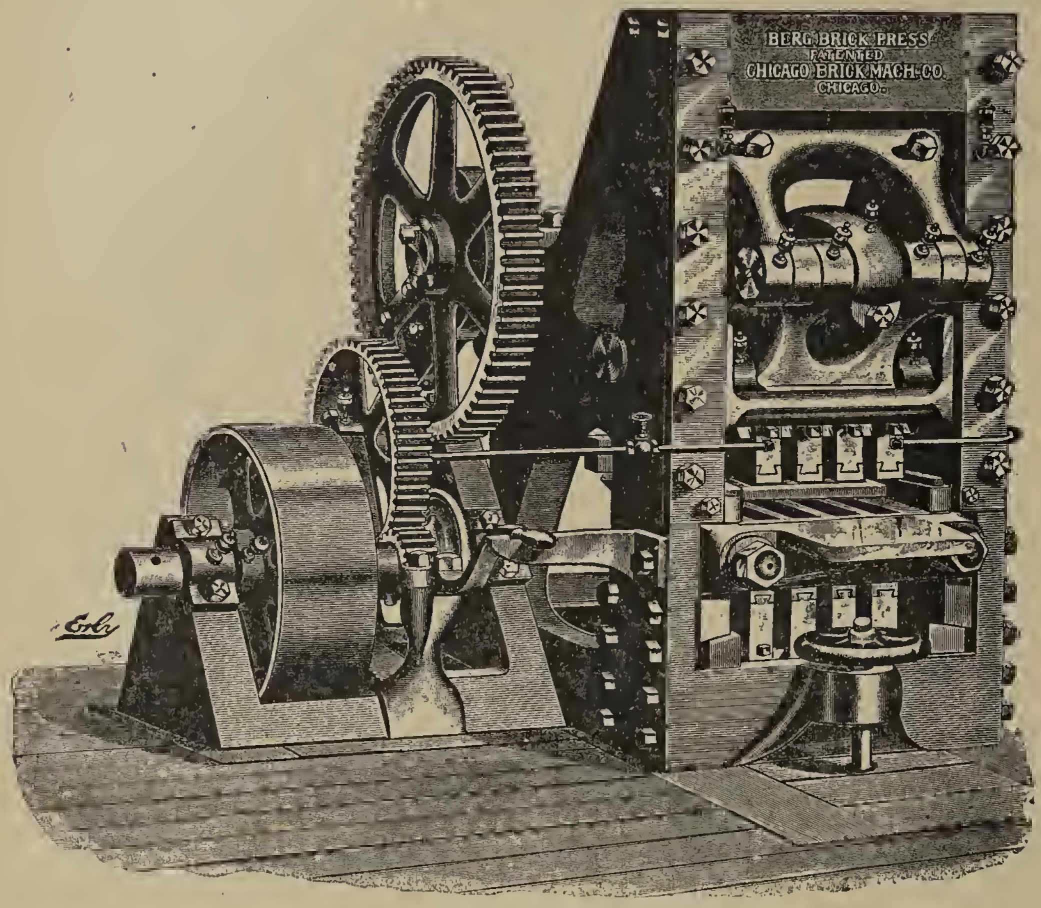
Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

Up=to=Date Machinery.



OUR **BERG BRICK PRESS** is the Most Modern in design and construction of all Dry Press Machines. Simplest, Strongest and most Durable.

It has three distinct pressures and an unequalled Mold Box. Absolutely unbreakable and fully guaranteed. Circular on application.

Our line of **Stiff Clay** and **Soft Clay Machinery** is also strictly **Up-to-Date.** All the latest improvements and most convenient devices.

Send for new 1899 catalogues.

CHICAGO BRICK MACHINERY CO.,
225 DEARBORN STREET.

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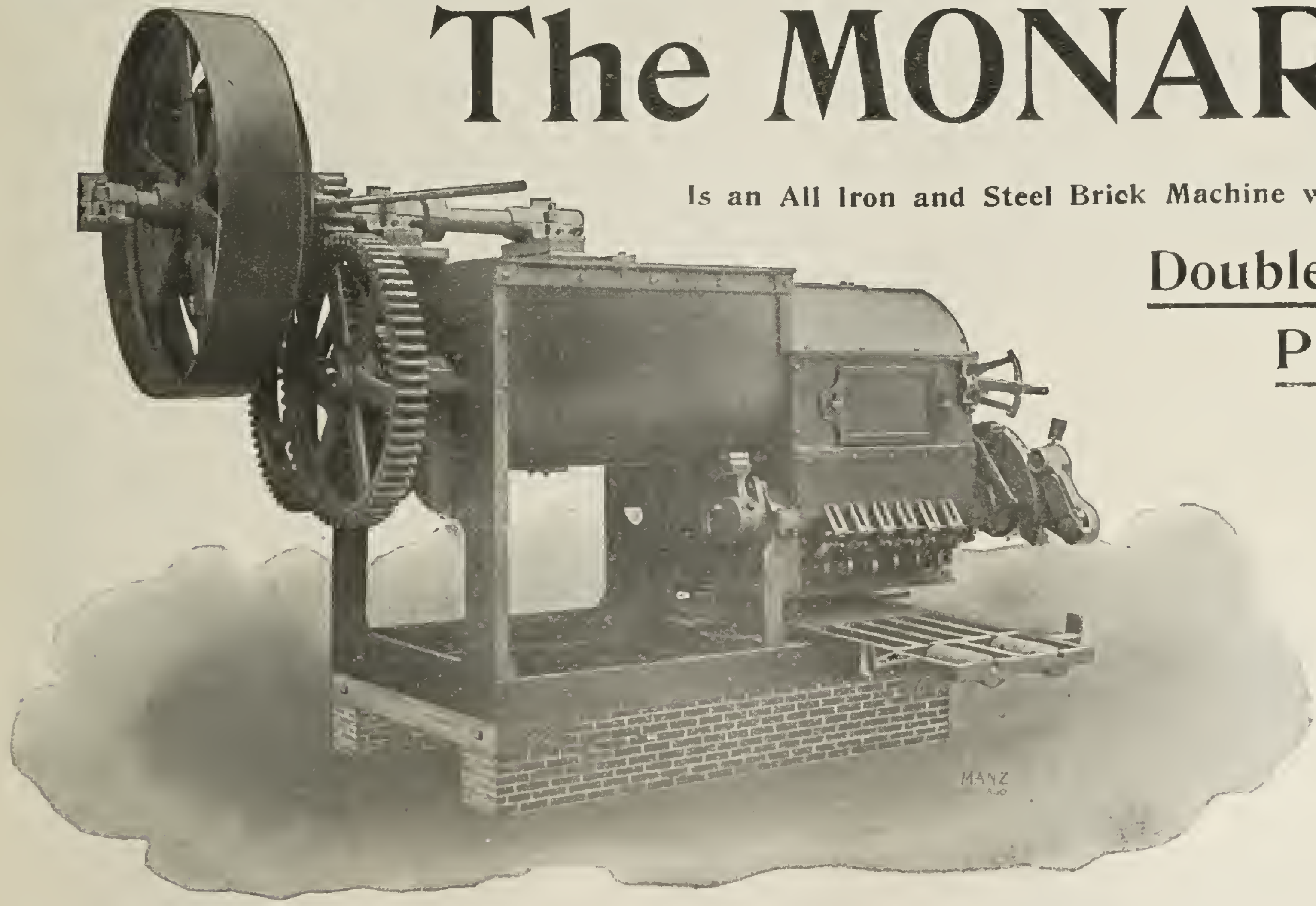
WHEN WRITING TO ADVERTISERS
Mention the Clay-Worker

Eastern Office: No. 284 Pearl Street, NEW YORK. **General Office and Works:** No. 231 North Union St. CHICAGO, ILL., U. S. A.



The MONARCH

Is an All Iron and Steel Brick Machine with

Double—
Pug Mill.

• • •

SIMPLE
IN CONSTRUCTION,
DURABLE
AND . . .
POWERFUL.

• • •

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER**. Engines and boilers. Send for 1899 Catalogue.

JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

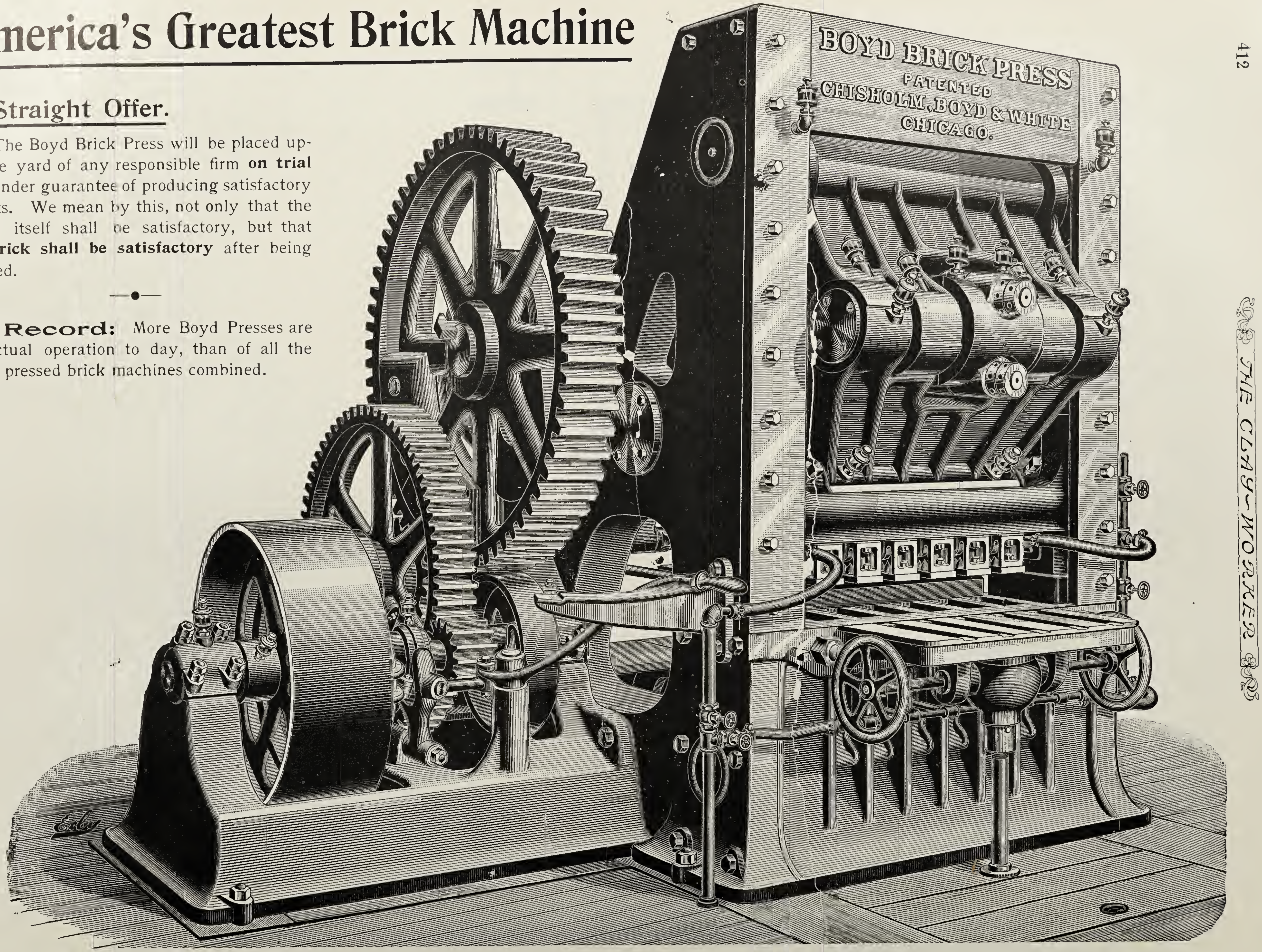
America's Greatest Brick Machine

A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

—•—

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,
57th and Wallace Streets.

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

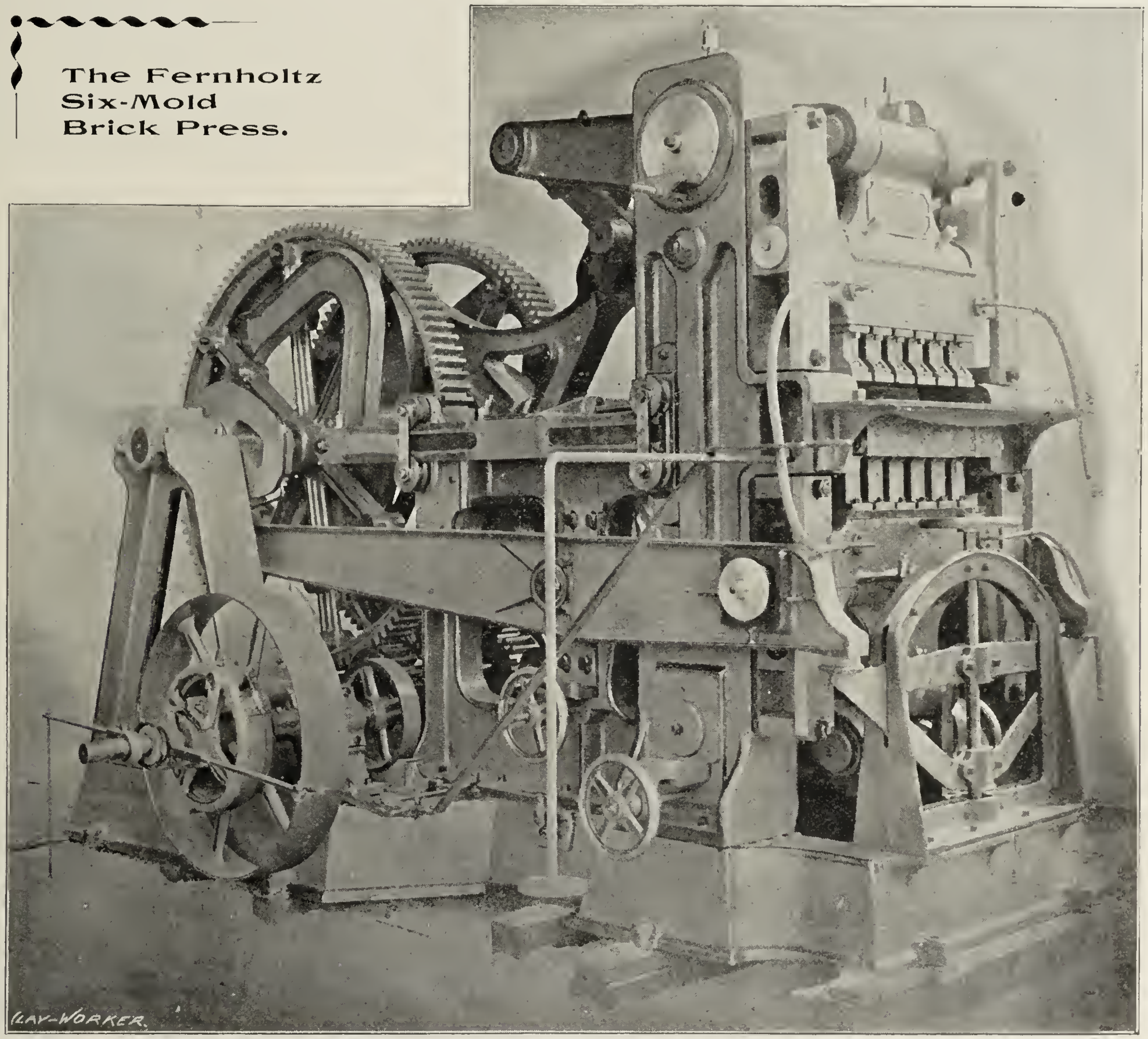
CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6-mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mold which is generally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible. We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.



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IS UNEXCELLED for the manufacture of **BUILDING BRICK, PAVING BRICK,**
Wonder Machines are made on original and correct mechanical lines. Second, they
known to expert mechanics. Hence their superior wearing qualities and large
Wonder Machines offer several distinct advantages: Owing to their peculiar
importance to paving brick manufacturers as it insures a product, whether repressed or
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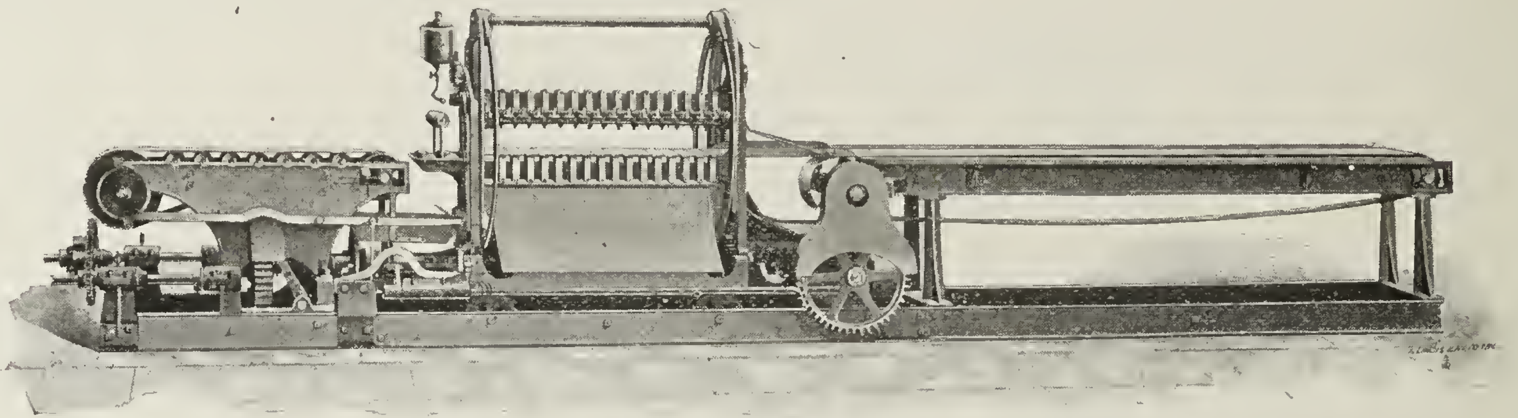

Cunningham's Improved Combination End and Side Cut Automatic Brick Cutter.

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OUR NEW COMBINED END AND SIDE CUT CUTTING
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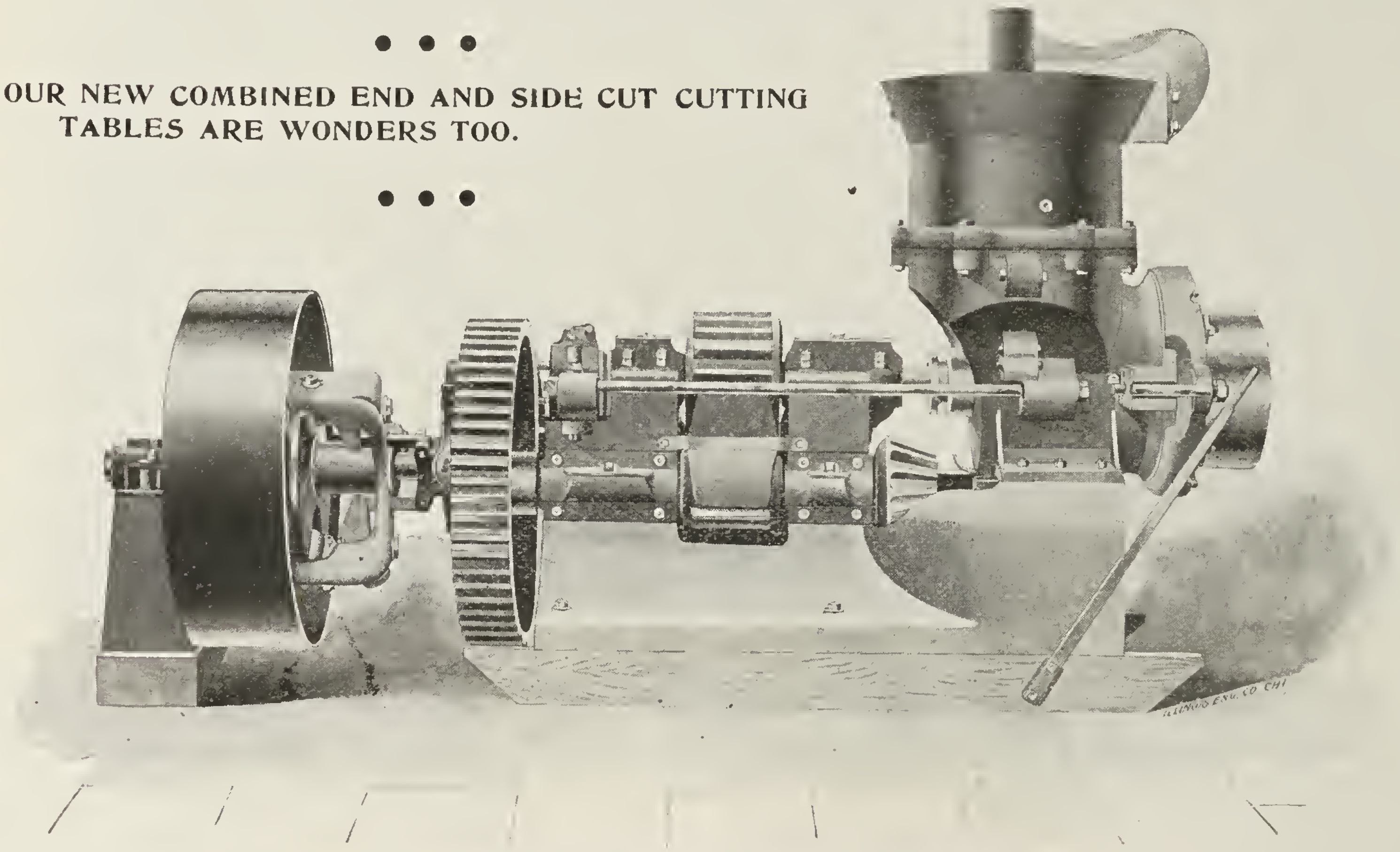

The Wonder Tile Machines, made in two sizes.

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HOLLOW BRICK and DRAIN TILE. This is due to several very good reasons. First,
are made of the very best material; and Third, in the best and most substantial manner
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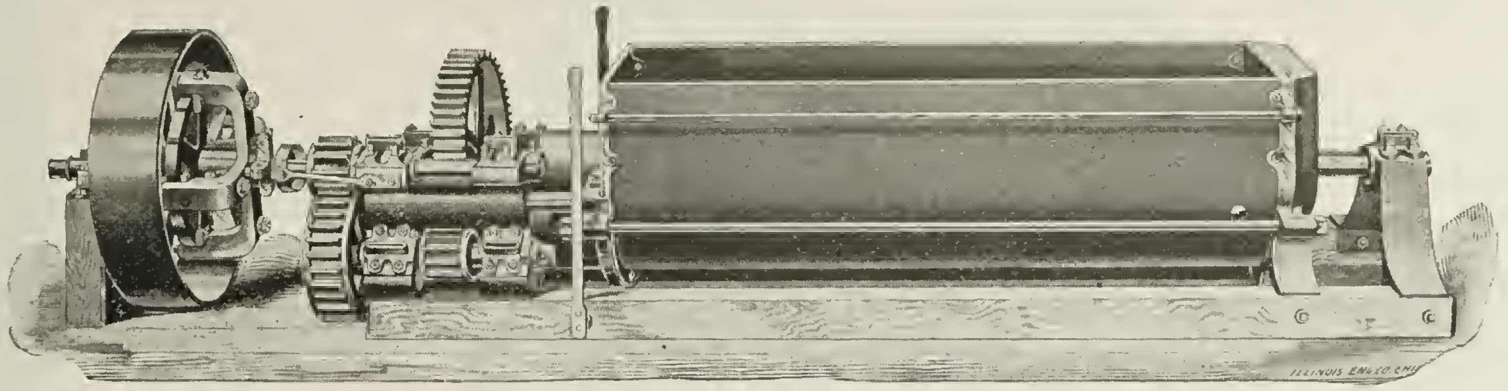
unrepressed, that will withstand the severe tests to which paving brick are subjected,
fully attested by all who have used them during the past ten years. As seeing is believ-
in their respective localities, who are using our machinery, for **Wonder Machines** speak
excelled by any.
Crushers, Pug Mills, Clay Elevators, Screens, Barrows and all Brick and Tile Yard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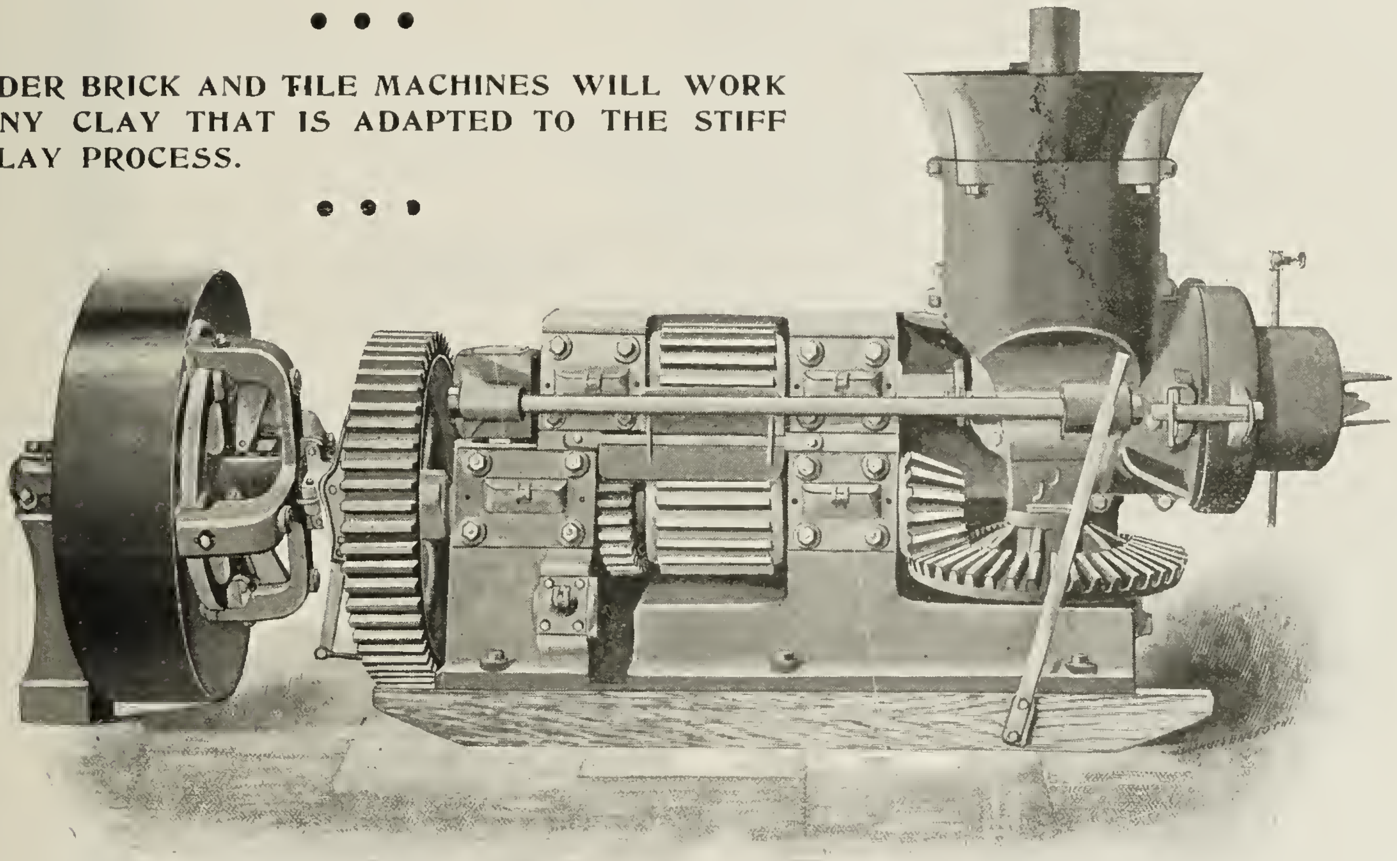

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Wonder Brick Machines, made in four sizes, with capacity ranging from 20,000 to 100,000 brick per day.

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Frankfort, Indiana.

The Williams Patent Crusher & Pulverizer Company,

OF

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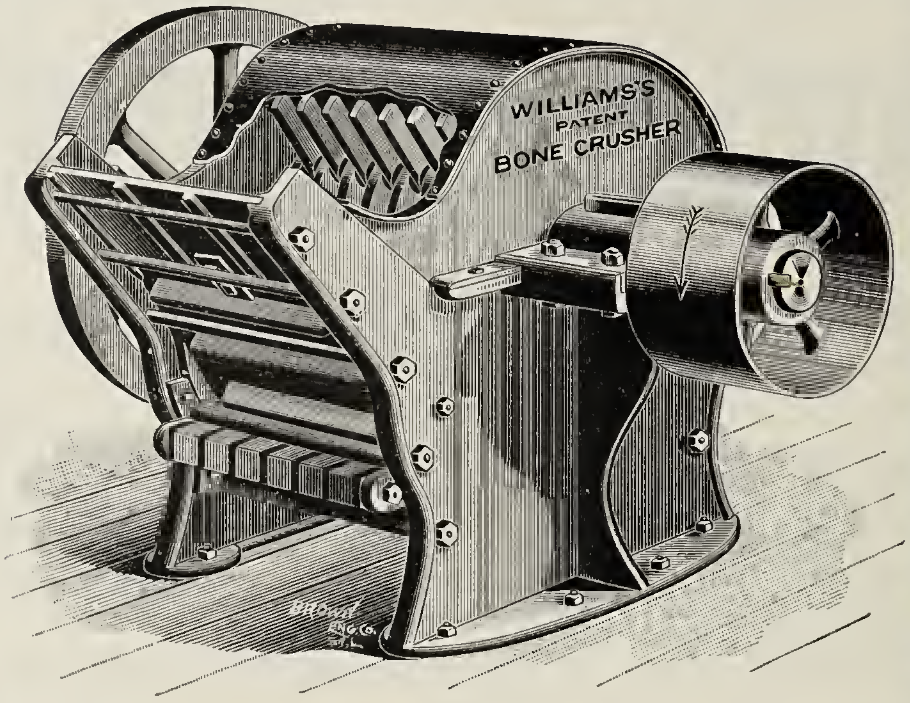

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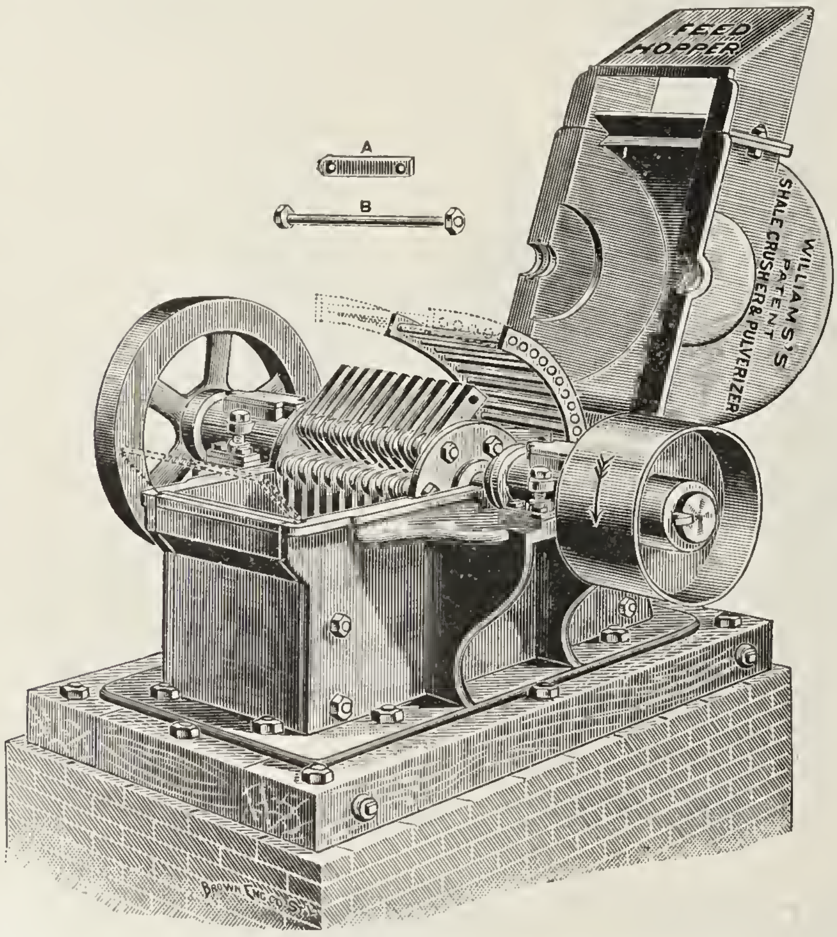
BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output. . . . . . .


FEED HOPPER
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WILLIAM'S PATENT SHALE CRUSHER & PULVERIZER

Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

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The Williams
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Crusher &
Pulverizer
Company,

2701, 2703, 2705 and 2707 North Broadway,
ST. LOUIS, MO.,
U. S. A.

NEW YORK OFFICE: Washington Life Bldg.
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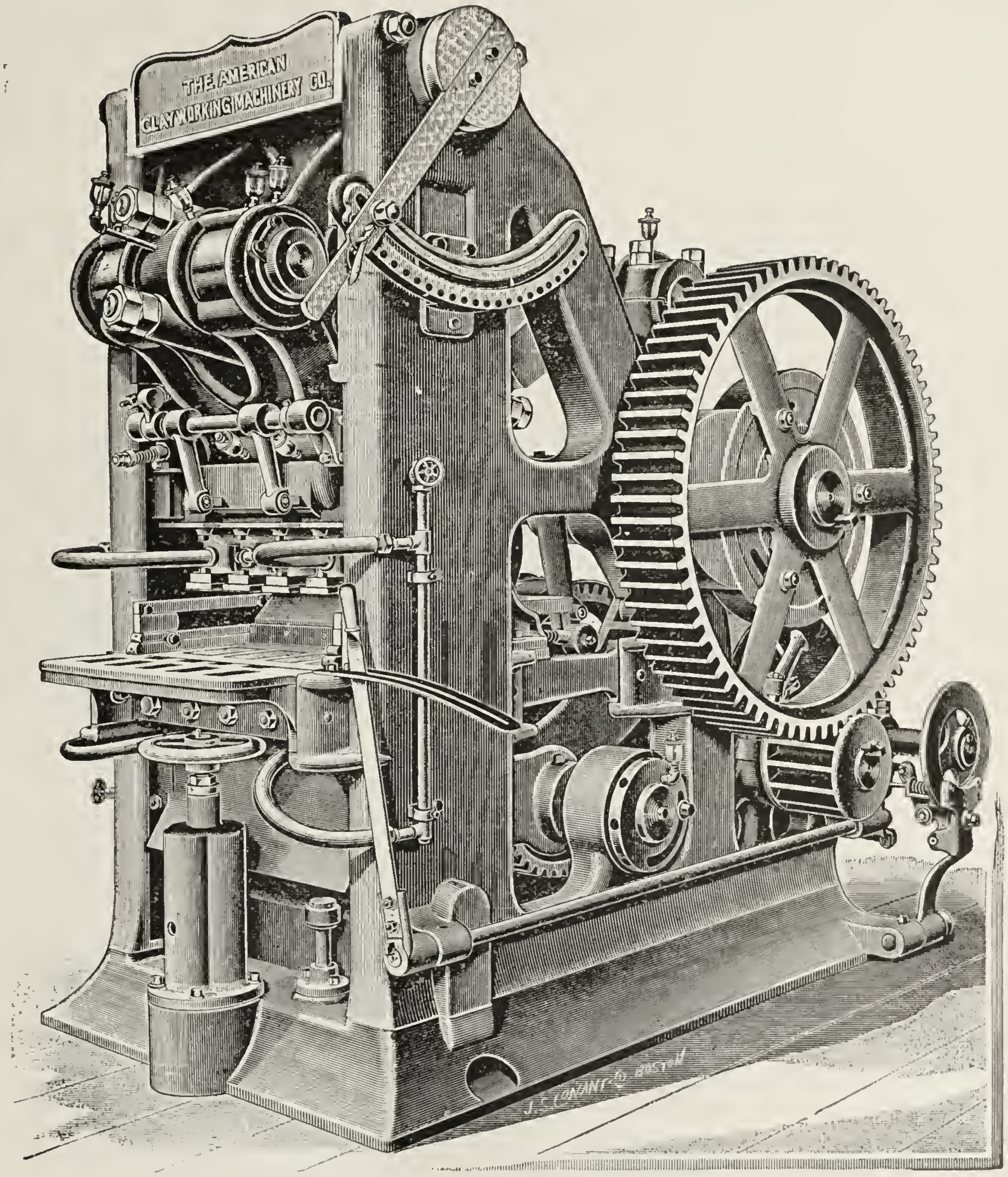
INSURANCE.

We Insure Your Product, By Insuring our Machinery.

OUR recognized and acknowledged superiority of machinery in the stiff-mud line is maintained in the excellence of our machinery for the manufacture of dry press brick. There is no line of machinery for this class of manufacturing that will equal ours. It combines great strength, simplicity, durability and ease of operation. There are no weak or delicate points to annoy and pile up expense in delays and repairs. There is an increase in output and quality from our machines. Its increased quality, which makes you reputation, and increased quantity, which puts more dollars to your credit in the bank. If you want rightness in machinery—the lasting kind—write us for particulars.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FOUR-MOLD PRESS BRICK MACHINE.

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New Catalogue on the Best Steam Dryer Built. If You're Interested Send for one.

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UNBIASED TESTIMONY

IS THE KIND THAT COUNTS.

What a manufacturer says about his own product may sometimes be open to doubt. It would be a weak sort of man who didn't "stick up" for his own handiwork. But what **others** say—that's another story. We are willing that

The Standard

Brick and Tile Drier

Should be judged by its record as made up by users. On this sort of testimony—the kind given below—"we rest our case."

Ensley Brick Co., Ensley, Ala.

Ensley, Ala., December 9, 1898.

The STANDARD DRY KILN CO.,
Indianapolis, Ind.

Gentlemen:—We are very much pleased with your Drier—it does even better than you guaranteed.

This is very gratifying to us as our first experience with Driers was very discouraging; in fact, a failure both as to drying and handling our material. The great mistake we made was in considering a proposition from and awarding the contract to a party who made us a lower price than yours, on our first Drier. In buying the second time we did not consider a bid from the first builder at all. Now we see the difference. There is no comparison between the two Driers, neither in equipment, workmanship or system.

Respectfully,
ENSLEY BRICK CO.,
H. L. Finkler, Sec'y.

Indianapolis, Ind., Nov. 3rd, 1898.

The STANDARD DRY KILN CO., Indianapolis, Ind.

Gentlemen:—The eleven track Steam Drier you put in for us at our Martinsville plant has been in use nearly one year, during which time it has been subjected to numerous and trying tests. Beginning as we did in the Winter with the clay wet and sloppy, and the shale full of frost, our soft mud brick entered the dry house cold and clammy. Under the scientific yet common sense method of distributing the heat and nature's own way of carrying off the moisture, our brick came from the Drier, sound and thoroughly dried and free from checks or fracture.

We dry our soft mud shale brick in 24 hours and our brick made from clay in 48 hours The Drier is easily controlled, in fact it runs itself with no expense so far, for repairs or renewals; all that is required is steam sufficient to keep the temperature at 120 degrees at the receiving end, and about 165 degrees at the discharging end.

The cars we purchased of you with Cage Roller Bearings and well supported and braced steel racks, without doubt are far and away the best and most practical we have seen or tried. In fact the Drier with its outfit is to us an agreeable surprise, in the matter of durability, practical use and expense on account of repairs.

Yours very truly,
THE ADAMS BRICK CO.,
J. C. Adams, Pres't.

The STANDARD Is the Drier that does not disappoint. It invariably does all and a little more than is claimed for it. It satisfies in every instance.
Our Catalogue and much more "Unbiased Testimony" can be had for the asking.

The Standard Dry Kiln Co.,

186 South Meridian Street. ***INDIANAPOLIS, IND.***

THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. XXXI. INDIANAPOLIS, IND., MAY, 1899. No. 5

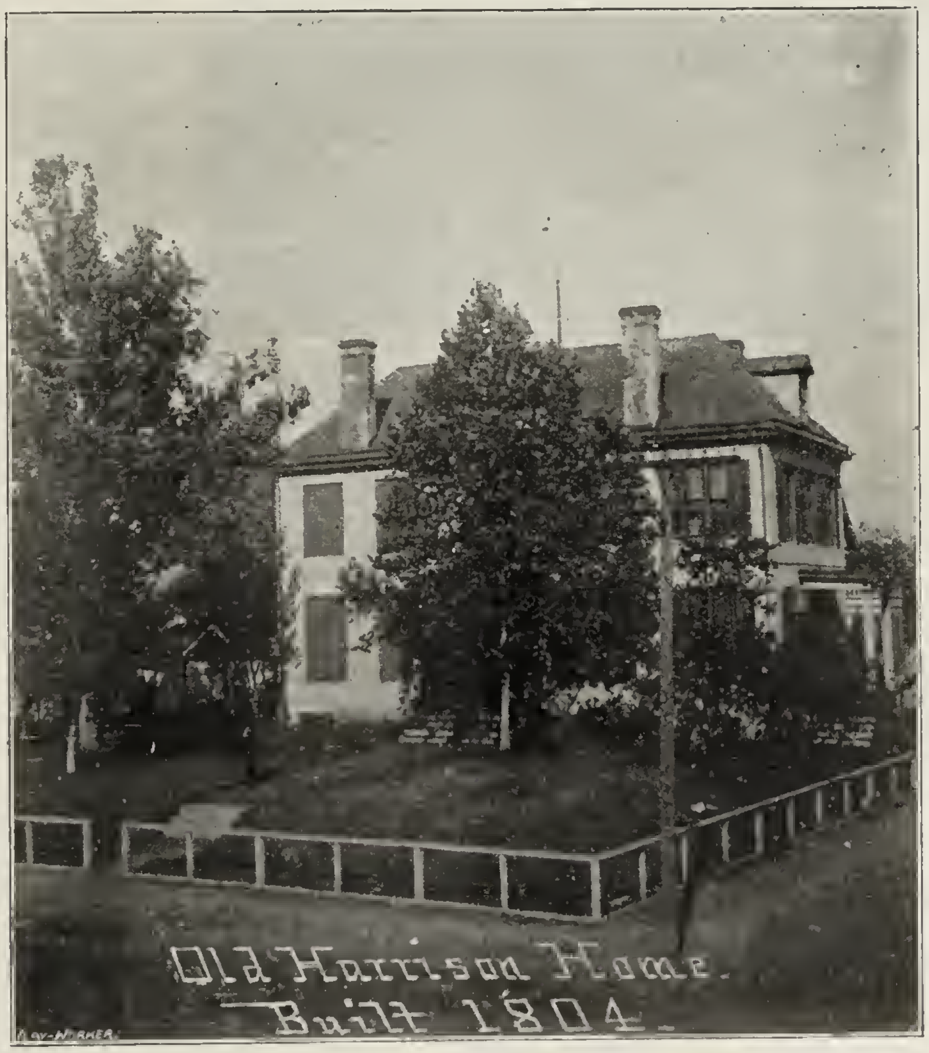
Written for The Clay-Worker.

THE FIRST BRICK HOUSE IN THE WEST.

President William Henry Harrison's Home.

IN A FORMER article we gave some facts regarding the present history of Vincennes, concerning its industries and future prospects. Much of large historical interest centers in this little inland city, some of which it is our purpose to speak, and this article will treat principally with its past.

It is the oldest city in the State, its settlement dating back to 1702, which makes it but two years the junior of Philadelphia. The settlement was first established by the Jesuit missionaries, and was one of a line of missions which extended across the country from Canada to Louisiana. A few years later (about 1725) the settlement was placed under the government of a French explorer named Francois Morgan de Vinsenne. The Indian name for the village was Chip Kaw Kay. The whites, who were principally French, designated it as "au poste" until after the advent of "De Vinsenne;" he built a fort and established "a quasi" government, and the village was named after him, being slightly changed to Vincennes. A few years later the fort was surrendered to the English, who held possession for over twelve years. In February, 1779, Colonel George Rogers Clark, of the American forces, acting under orders from Patrick Henry, Governor of Virginia, with a mere handful of men, captured the fort, called by the British Fort Sackville, with its entire garrison and stores, without any loss on his side, and one killed and one wounded in the fort. The blow was a humiliating one to the English commander, when he saw the small force of the Americans. This was the end of English possession in the interior territory, and gave a vast scope of country to Virginia, which was ceded to the United States in 1784 as Territory of the Northwest. Laws were passed at various times regulating the government, but not until 1800 was the Territory of Indiana divided from the Northwest Territory, and William Henry Harrison, of Virginia, appointed as its Governor. In 1801 he removed to Vincennes with his family and chattels, which included among them some slaves or servants, as they were then styled.



BUILDING UNDER DIFFICULTIES.

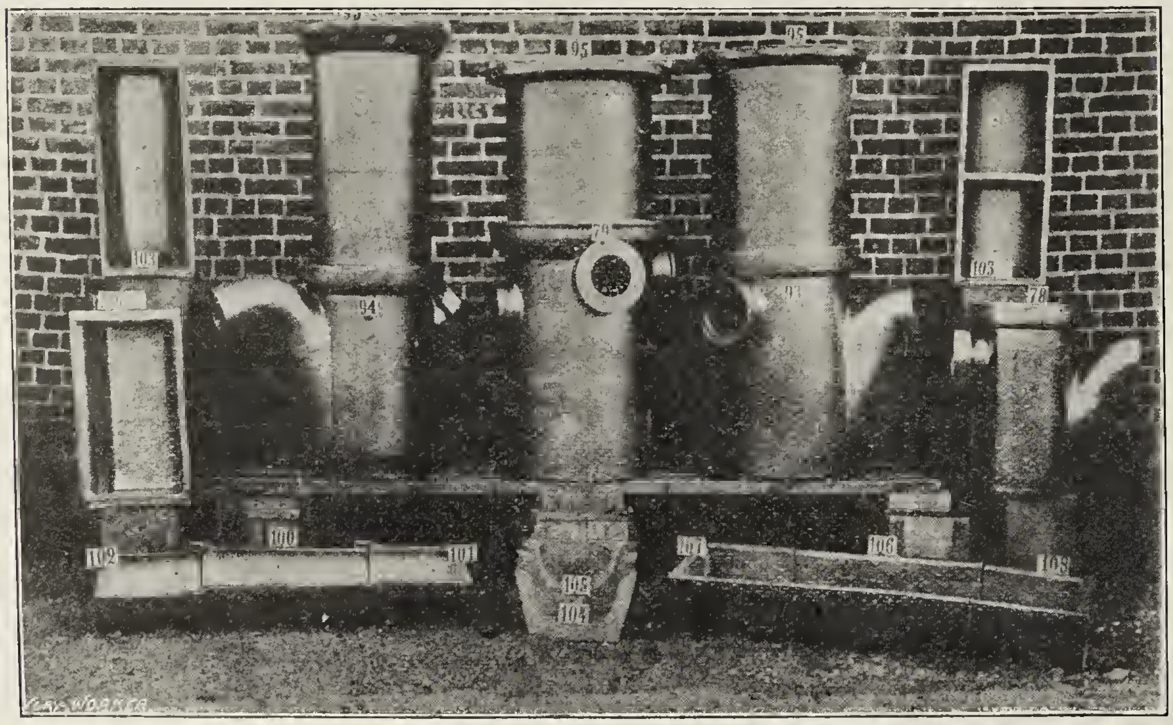
Governor Harrison made Vincennes the capital, and at once set about to establish order and form of government. In 1804 he built his residence. Governor Harrison was born Feb. 9, 1773, and was therefore in his thirtieth year when he began this task. When we consider the times and difficulties under which he labored we must acknowledge it was a stupendous undertaking for a young man. Material was hard to get, skilled labor was scarce and illy provided with tools and appliances; some of the material had to be imported from beyond the sea; nails were hand forged, and lumber was whipsawed by hand and timbers hewed out with broad axes.

Our purpose in this article is not so much designed to recount the history connected with the times and place as to call particular attention to the substantial character of the house and the wisdom displayed by its projector and owner in overcoming the difficulties and inconveniences.

This is said to be the first brick residence built in this country west of the Allegheny mountains. The brick in it were made on what is now known as the Archie McKee farm, about four miles southeast of Vincennes. They were made by Mr. Samuel Thompson, who emigrated from New Jersey very early in the century. He was a brickmaker by trade, having worked at that business in New Jersey. When Governor Harrison began to plan for the erection of his mansion he bargained with Mr. Thompson for the making and delivery of the brick necessary for the completion of it, according to his design, Mr. Thompson taking as payment four hundred acres of land six miles north of Vincennes. This land is still owned by the Thompson heirs, one hundred and sixty of it belonging to the grandson, Samuel Thompson.

When the house was built it was nearly half a mile from the fort and village proper, the nearest neighbor being about half the distance. It now is on the corner of Scott and Park streets, and only about three hundred feet from the main line of the Baltimore & Ohio Southwestern Railway. It is almost surrounded by railroads and factories, and the city water works, so that it is difficult to get a good view of the house alone.

There are twelve large and commodious rooms above the basement, exclusive of halls, pantries, closets, stairways, passageways, attic rooms, nooks and corners, etc., all so dear to the average housewife and antiquarian as well. Ten huge fireplaces on the two main floors sufficed to heat the rooms. The large room on the front corner originally had two fireplaces in it, but it has since been partitioned off into two rooms. The view of the building shown in the photograph is taken on the south side, with the porch to the right fronting east. When originally built a veranda extended along both of these fronts. The large room in the rear on the left of the engraving overlooks the Wabash river on the west, and is known as the "round room," or council room. It was in this room where the first territorial council was held, and where the important treaty negotiations were held between the Governor with his advisers and the Indians, and it was in this room where the company of guards were secreted at the time of the rupture between Governor Harrison and Chief Tecumseh. The conference at the time was held a few rods east of the house, Tecumseh having refused to take a seat on the veranda, threw himself on the ground with a tragic air, remarked: "The sun is my father, and the earth is my mother, I will rest on her bosom."



Sewer Pipe, made from Shales near Malino, Sweden.

There are eight large rooms in the basement, four of which have large fireplaces. Some of these are still provided with the old iron cranes and pot hooks, which were built into the chimney walls as a fixture. The basement was evidently designed as a fortress if necessary against an attack or seige as well as for their other several uses, which can easily be determined by their arrangement. There was the laundry, storeroom, kitchen, servants' rooms, and in all probability a guardroom or quarters for a small detachment of military. There was also one room in the cellar which was designed for a powder magazine or strong room; it is something over twelve feet square, and was arched over with an eight-inch brick arch. This arch has been taken out, but the skew backs from which the arch sprung still remain, as well as the foundation and doorsill of the front wall.

GOOD BRICKWORK.

All inside walls are of brick, thirteen-inch walls, solidly built and apparently as good as when it was first erected. The joists, floors and roof timbers are all in good condition; black walnut entered very largely into the construction, for floors, stairs and heavy timbers, and also for inside shutters, doors, etc.

The history of the house is somewhat checkered and interesting withal. After General Harrison's election as President and his death which followed soon after his inauguration, his business affairs were found to be sadly involved in debt, and the place was sold at sheriff's sale, and it passed into the hands of Mr. Pigeon. The house was vacant for some time, and was used as a place to store large quantities of corn, and sheep occupied the basement. Later it was used by Mr. Pidgeon as a residence, he being the father of some charming daughters it was very aptly named the "Pidgeon Roost." Our present State senator, Mr. Royal Purcell, was married in this house to one of Mr. Pidgeon's daughters. While the Ohio & Mississippi Railroad was building, the house was used as a hotel, and a large frame addition was built on the north side which was connected by a covered passageway. It was then known as the Harrison House or hotel, and a sign was painted across the south front in large block letters. After the completion of the railroad the hotel was closed, and the sign painted over and forgotten. The present owner, Mr. Ed. Shepherd, after he came into possession of the place, took photographs of the house, and in developing the pictures the negative showed the sign very clearly where the eye failed to detect it on the building. The building was also at one time the office of the receiver of public lands. John Scott Harrison, father of ex-President Benjamin Harrison, was born in this house.

The framework of the roof, floor, joists, sills and beams were hewed from timber which grew on the adjoining land, and show great care in the preparation of the work, as well as in the planning of the structure, which at the time it was built was a magnificent structure, The sum expended on the house and its appurtenances was said to have been nearly $20,000, which for a private residence, built at a time when log structures were at a premium, was certainly a princely outlay. Some of the posts in the attic and roof frame were planed up square and smooth; the lath were rived or split out of oak logs, as were also the first shingles for the roof; the lath were nailed in place, but the shingles were said to have been fastened to the frame with wooden pins. The floors were all doubled or deadened by a course of split boards put in between the floor joists, and over these a heavy coat of mortar was spread; above this came the matched hardwood floor of heavy thickness. The glass was imported from beyond the sea, and a few of the small square panes still do duty in upper windows in the back part of the house. The lower story has a clear heighth of thirteen feet, the second story eleven feet.

It is held as a fact by tradition in the Thompson family that there is one day's tale of brick that were delivered on the grounds which were never paid for by Governor Harrison. We give this as we received it from the lips of Mr. Samuel Thompson, who in turn heard it from his father, who was known to the circumstance. The story goes that when it came to the settlement of account between the elder Thompson and the Governor it was found that a certain quantity were credited as having been delivered on a date which fell on Sunday, and consequently the Governor threw out that part of the account. In fact the whole history of the house and most of the local history of Vincennes is traditional, and is fast passing out with the older generation. The present owner, Mr. Ed Shepherd, and his estimable wife, take some pride and pleasure in showing visitors over the house and grounds, and recounting all the collected traditional stories connected with its early history. J. A. REEP.

Written for The Clay-Worker.

THE SWEDISH CLAYWORKING INDUSTRY.

SO LITTLE has been written concerning the Scandinavian clay deposits and clay products that in visiting the country one is surprised to find how extensive they really are, for Sweden possesses clays suitable for the manufacture of nearly every grade of clay product from the common brick to the whitest porcelain. Red clays, marly clays, vitrifiable shales, refractory clays and shales and finally kaolins all occur within the kingdom.

The products made from these clays supply not only the Scandinavian peninsula, but in many instances are exported.

The Swedish clays are confined to several distinct formations, which, in each case, underlie more or less well-defined areas.

Around Stockholm the surface clays are important and form the basis of an active brick and terra cotta industry. These clays are generally red and plastic, but not refractory, and are well adapted for making brick, roofing tiles and common pottery. At times they become very calcareous, and, if the lime is finely and evenly distributed, the clay is suitable for glazed earthenware, and finds ready application for the manufacture of oven tiles. Owing to the very calcareous nature of the clay, the ware will take glazes of considerable range in composition. The limy clays are especially developed around Upsala, north of Stockholm.

At the latter city both terra cotta and front brick are produced.

The refractory clays of Sweden are confined to the coal-bearing formations of the southern portion in the province of Skansen. They are all shale clays, and vary from very refractory ones to semi-refractory materials, which can be made to partially vitrify with hard firing. The most refractory beds are mined at Billesholm, Bjuf and Stebbarp, and are mostly materials of good plasticity.

Others of slightly lower refractoriness are also mined at Bjuf and in addition at Hoganas.

The semi-refractory ones occur at Stebbarp, Helsingborg and Wallakra. In all of these the percentage of alumina is high, and the amount of total fluxes is low, as shown by the following analyses:

	Scania	Hoganas (Burned)	Bjuf (Burned)
Silica	50.86	68.70	54.20
Alumina	30.02	26.40	42.00
Ferric oxide	2.03	1.60	1.60
Lime	.10	.40	.50
Magnesia	.67	.50	.50
Alkalies	.99	2.40	
Ignition	14.93	2.40	1.20
Titanic oxide	.46		
	100.06	100.00	100.00

As the fire clays occur interbedded with the coal seams, in beds three to four feet thick, they have to be mined by means of shafts and tunnels.

Many of the Swedish contain titanic oxide, the shale from Billesholm containing .80 per cent. The gray shales of Bjuf and Ljungsgard, with 16 to 18 per cent. of carbonaceous matter, require sharp working to develop sufficient plasticity, but the equally refractory shales and clays of Billesholm, with 45 to 60 per cent. of carbonaceous material, are entirely non-plastic.

Around Stockholm, as well as at other points, both the soft and stiff-mud processes are used for molding brick, and do not differ essentially from those in this country.

The semi-dry and dry-press methods find application in the making of front brick, and both the hydraulic and ordinary type of presses are used. The bricks are sometimes burned in up-draft, at others in down-draft kilns.

Sweden has two large porcelain works, viz., the Rorstrands Aktiebolag Gesellschaft and Gustafsberg Porcellin Fabrik. The former may be classed with the celebrated factories of Europe, having been founded in the fourteenth century.

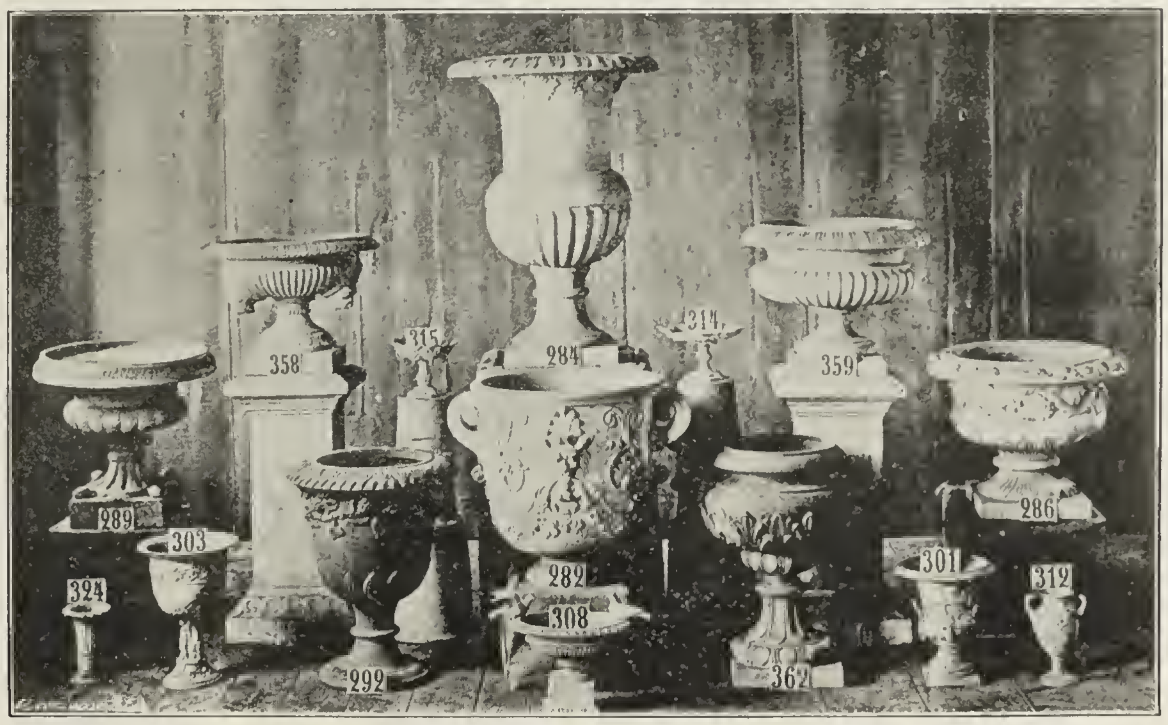
The raw materials used at these works are china clay from England and Germany, yellow clay from Scania, and semi-refractory clays from Bornholm.

The feldspar and quartz are from the company's mines at Ytterby and Svinnige. Indeed, the former is widely exported, and is one of the ingredients of the Seger cones. The spar when mined is red, but, after calcining, is pure white.

Great care is taken at the Rorstrand factory to weather the clay carefully.

The products include both white earthenware and porcelain, the latter being decorated in various styles, largely underglaze, but much has been made resembling the blue decorated Royal Copenhagen porcelain.

During the past year the company brought out a number of beautiful vases covered with a dull glaze with metallic luster, chiefly of copper color, the effect being that the article suggests a production in bronze rather than clay.



Terra Cotta Vases, made from Semi-refractory Shale, Hoganas, Sweden.

The Gustafsberg factory has won some reputation by the production of bisque figures, but other lines have been some good imitations of Wedgewood ware and Sevres blue.

The great center of Sweden's clayworking industry is around Hoganas, where factories of large extent are located, their products including brick, sewer pipe, terra cotta vases, stoneware jugs, tubs and basins, and earthenware covered with a lead glaze.

Good fire bricks are made at Vallakra, and at Kramberga vitrified brick, sewer pipe and front brick are produced.

Refractory wares, including fire bricks and retorts are made at Ifo, in southern Sweden, from local kaolins. These materials are of high purity, and sometimes closely approach kaolinite in their composition, as can be seen from the following analyses:

Silica	46.83	47.53
Alumina	37.22	35.51
Ferric oxide	1.31	2.43
Lime	.21	1.03
Magnesia	none	none
Alkalies	.40	.42
Ignition	14.12	13.15
	100.09	100.07

The growing success of the Swedish iron industry, and the presence of fine clays so near at hand, and often of good refractoriness, should be a source of gratification to the clayworker of that land.

HEINRICH.

Written for THE CLAY-WORKER.

A BRICK FACTORY IN A WOODEN TOWN. No. 12.

L. C. M.

STRANGE AS IT MAY SEEM, there is a strong prejudice in the minds of many good people against college training for men who enter the fields of ordinary business and labor. One would think that that prejudice would have been eliminated from all minds long before the close of the nineteenth century. But here it is, still doing business at the old stand while the twentieth century is knocking at our very door. It has not been three days since I heard a prominent business man of our town remark "That boy was spoiled by giving him an education." But *that boy* was made of clay, and had the natural perversity of clay in his constitution. And, as it is often difficult to tell the reason our finished products are not what we destined them to be, so it was hard to tell what spoiled that boy. True, the day was when educated men—men who had spent much time and means in training their minds in our colleges—most generally devoted their energies after leaving college to some professional career. But the question of supply and demand soon changed all this. The man of scientific and literary attainments was forced to seek other fields than those occupations generally called professional. To-day he is crowding into every vocation of life that promises fair return for his energies. He comes into every field with his wits sharpened and his understanding broadened by his scientific training, and gives an added impetus to every wheel of this government from the soap factory to the President's chair. He is on the farm, in the slaughter yards, railroad offices, machine shops and mines, everywhere, converting his knowledge of the laws of nature into something that adds to the comfort and enjoyment of his fellow-men, and gains well-earned dollars for himself. He goes wherever there is a demand for his talents. And, when the clayworker called for him, he responded with a good will and a strong hand. We are just beginning to feel the effects of his great influence and to appreciate his efforts. He began his first scientific work in the great potteries of Germany and France, for there was the greatest demand for him. But the demand has widened out more and more, until the brick factories called on him for aid. And now even our small yards of 20,000 per day could profitably employ an expert by giving him a working interest in the profits of the plant. No one who will impartially look over the field of clayworking, see the vast improvements made during the last twenty years, and note the character and education of the men who have been the prime movers in this progression, can doubt the great benefit resulting from applying scientific methods to every phase of our work. But the work is not one-half done, unless the old adage is true, "Work well begun is work half done."

How nearly the science of clayworking may be to perfection it is now impossible to know, but we feel confident, from past experience in this and other fields of labor, that the scientist need not rest upon his laurels, but should be up and doing, for there is enough ore in sight to keep him digging for a century longer. What lies further back and deeper down, future generations may know. We are expecting a great deal from Professor Orton and his boys. They seem to be on the right road. And, if they disappoint us, it will greatly retard the progress of scientific work in our line. But it will be only temporary. Others will take up the work and make a success of it. I may be called upon to apologize for even suggesting the possibility of their failure. And, for fear that may be true, I will do that right here. But I would enter this as a word of warning against following the example set by many of our training schools who have given diplomas to young men of such inferior attainments that they have reflected dishonor rather than glory upon their trainers. Clayworkers need the services of these young men, and want them to be a success. I predict that every young man who graduates from this school will find employment at a good salary within thirty days after receiving his diploma. If one of them fails he will do the cause more harm than can be overcome by the efforts of ten successful ones. We need them in our fight for supremacy over cheaper but far inferior material. These cheap articles are in the lead now, and our only salvation as clayworkers is to make better brick, tile and terra cotta, make them at less cost, until we can come so nearly competing in prices that our superior material will drive the inferior out of the market. We need them as architects as well as manufacturers. There is not an architect within less than forty miles of our little city. They are simply carpenters, and oppose the use of our materials in every way possible, for woodworking alone is in their line. Our brick masons can build after another man has planned. But every town needs an architect who appreciates the value of brick as a building material, and will assist the manufacturer in pushing its claims.

Some years ago I lived in a town of about 5,000 people. Like the one I now live in, it was a wooden town. There were a few residences of brick, but wood was rapidly gaining in favor because no one seemed to appreciate the possibilities of brick as an artistic building material. The new residences were all of wood, and beautiful buildings they were, too. Every architect was a carpenter. But the influence of one man changed the tide in favor of brick. He was an architect and an artist as well. When he moved into that place there were two common brickyards, making a very good article, but their product could not compete with wood for cheapness and beauty. Every building planned by this architect, even to the small cottage, was elegant in design, for the plans came from a man who knew his business. He fully appreciated the value of brick as a building material, and knew how to use them for artistic effect. When he could not get the desired effect from home product, he imported sufficient for his needs. Brick instead of wood was his idea of a building material, and he never failed to recommend it to his customers. It was not long until brick factories sprung up to supply the demand caused by the genius of one man. To-day there are two good brick and hollow block factories in that town, besides several hand yards. All seem to be doing a good business. And thousands of dollars that once went out for lumber are now paid to home laborers who produce material that the weathering of ages will not affect.

We are looking for the School of Ceramics to send out such men as this one, and even better. We want them to show us how not only to use bricks to the best advantage but also how to make all that is needed to meet the demands of the times for durability, beauty and elegance.

(To be continued.)

PERCOLATION THROUGH BRICK AND STONE.

The results of some experiments to ascertain the most effective material for checking the percolation of water through brick or stonework are given by Mr. A. W. Hale in a recent number of the Engineering and Mining Journal. The investigation was mainly carried out in connection with the new Croton aqueduct of New York, and the substances employed in the experiments were numerous and varied. It was found that Portland cement gave the best results, and that the hydro-carbons, which are commonly regarded as suitable materials for rendering brick or stone impervious to water, oxidized by exposure to air and gradually disappeared. It was also found that a brick was rendered impervious to water by cement more rapidly when the cement was applied as a wash by means of a brush than when applied with a trowel in the usual manner. A brick which had been treated with four cement washes was found at the expiration of two months to be quite impervious to water, even under a pressure of two hundred pounds per square inch.

Written for the CLAY-WORKER.

THE FIRE CLAYS AND FIRE CLAY INDUSTRY AT BOLIVAR, PA.

BY T. C. HOPKINS.

THE FIRE CLAY works at Bolivar, Pa., are probably among the best known in the United States, as they have now been in continuous operation for more than half a century, and are conspicuously located on the Pennsylvania Railroad, one of the great trunk lines to the West.

The village of Bolivar is on the south bank of the Conemaugh river, a few miles below Johnstown, but the fire clay works and the mines lie on both sides of the river, partly in Westmoreland county on the south side, and partly in Indiana county on the north side of the Conemaugh. Just below Bolivar the Conemaugh river cuts through Chestnut Ridge, forming some of the finest scenery in the State; one of the prettiest views is that known as the Packsaddle.

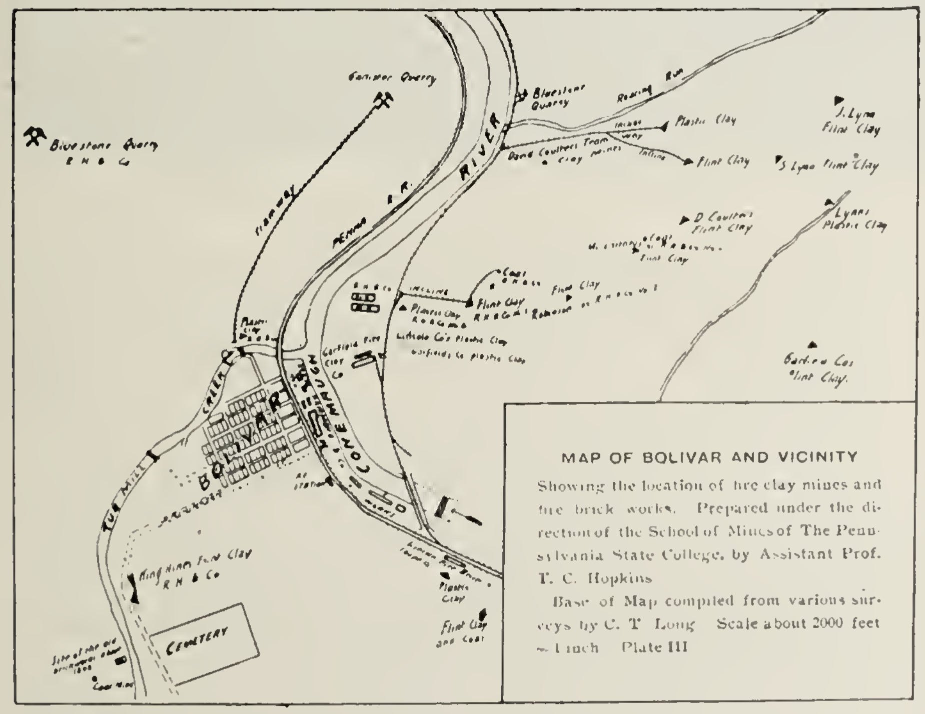
The Clays.—Both the flint or hard fire clay and the plastic or soft fire clay occur at Bolivar in several different beds of varying thickness and character. They occur at different horizons in the lower barren coal measures, from the Pottsville conglomerate at the base to the Mahoning sandstone at the top.

The following section was made by the second Pennsylvania Geological Survey about twenty years ago:

SECTION OF STRATA AT BOLIVAR.* (STEVENSON.)

	Feet.	Inches.
Mahoning sandstone	20	..
Clay	3	..
Upper Freeport coal	8	9
Drab fire clay	3	..
Sandstone 2 feet, clay and iron ore 3 feet, coal 4 inches, clay and shale 30 feet	35	4
Sandy shale 25 feet, fissile shale 30 feet	55	.
Lower Freeport coal 1 foot 5 inches, clay and shale 6 feet, limestone 3 feet	10	5
Shale 45 feet, upper Kittanning coal 1 foot 6 inches, fire clay 1 foot 6 inches, limestone 1 foot 6 inches	49	6
Concealed	47	.
Sandstone 40 feet, shale 12 feet	52	..
Clarion coal 1 foot 6 inches, fire clay 2 feet	3	6
Concealed 25 feet, shale 20 feet	45	..
Concealed 35, Brookville coal blossom, shale 15 feet	50	..
Pottsville conglomerate	..	..

This section gives the general order of succession of the strata, but not a very accurate idea of the thickness of the different beds at the present workings. In the various openings examined by the writer during the past summer all the clay beds that have been worked show a greater thickness than is designated on the section. There is also such a variation in thickness of the intervening beds that it is in places difficult to correlate the beds with those on this section. This may be due in large measure to local variations both in the character and in the thickness of the strata.



MAP OF BOLIVAR AND VICINITY

Showing the location of fire clay mines and fire brick works. Prepared under the direction of the School of Mines of The Pennsylvania State College, by Assistant Prof. T. C. Hopkins

Base of Map compiled from various surveys by C. T Long Scale about 2000 feet = 1 inch Plate III

The most important bed of clay is that underlying the upper Freeport or E bed of coal, and widely known throughout the State as the Bolivar clay. It varies greatly in thickness, ranging from six to twenty-five feet at different points in the State. It is twenty to twenty-five feet thick at Bolivar. Practically all the flint clay used at and shipped from Bolivar, except the little shipped in from other points, comes from this bed.

On the south side of the river it has been mined extensively over a large area on the King tract, owned and operated by the Reese-Hammond Fire Brick Co., and known as their "King mines," about half a mile southeast of Bolivar, on the slope east of Tub Mill creek, near the base of the ridge, where it has been worked for many years, at present on a small scale compared with the operations of former years. The clay was formerly obtained by drifting into the bed in underground workings, but lately the overburden has been removed and most of the clay quarried from the surface, showing a face of clay eighteen to twenty feet in thickness. The clay contains much iron oxide in the form of nodular secretions or segregations, known among the mining men as "ore balls." So abundant are these in certain spots as to give to the quarry the appearance of an iron mine. The ore is in general more abundant in the upper part of the clay bed than in the lower part, and most abundant near the outcrop of the clay. The ore balls are readily distinguished from the clay by their color and weight, and are picked out by hand in the mining. The clay is transported on trucks on a tramway to the edge of the village, about half way to the works, and the remaining distance by wagon.

View of Mine, Bolivar, showing the Concentric Structure in the Flint Fire Clay.

Another point south of the river where the flint clay is mined is on the property of the Lincoln Company, formerly known as the Enterprise. The clay is here mined on the hillside more than a hundred feet above the works. The bed is eighteen to twenty feet thick and overlain by about eight feet of shale and "soapstone," followed by six feet of coal. The clay is obtained by underground working. In some places the entire thickness of the clay is removed, and in others only the upper part, about six to eight feet thick, which is quite dark in color and is called the "black clay." It is thought to be of superior quality to the lower or lighter colored part of the bed. In one place in the clay mine an inclined opening has been made from the clay mine up through the overlying shale to the coal, which is run down on an inclined track and brought out at the same opening as the clay. This opening is on a bench of the hill several hundred yards distant from the works and the clay is run in cars on a tramway along the bench of the hill to the head of the incline, where it is run down to the works by gravity.

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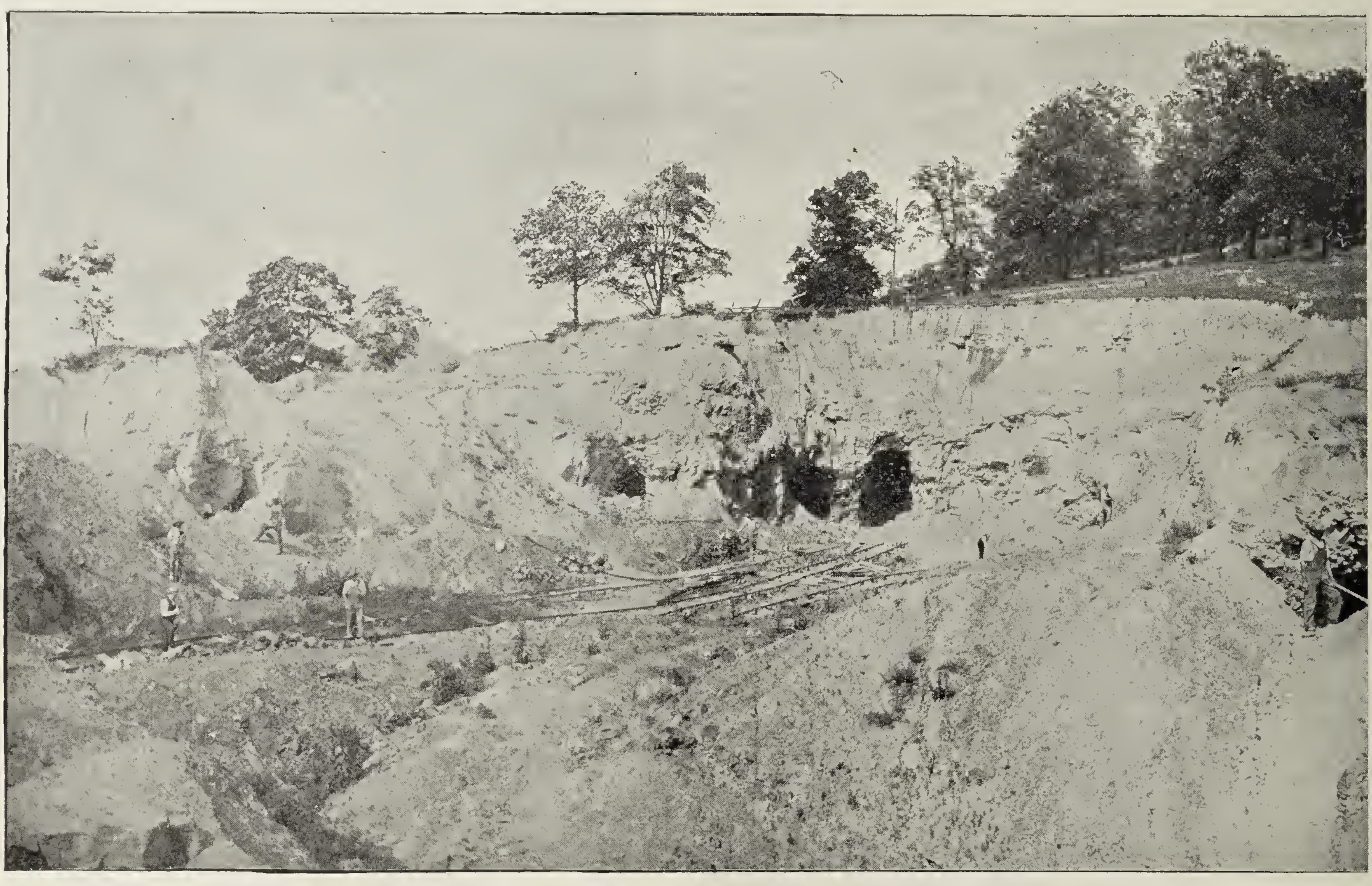
*Second Pa. Geol. Surv. Rep., 1877, K K K, Ligonier Valley, page 158.

On the northeast side of the Conemaugh river, in Indiana county, opposite Bolivar, this upper clay bed has been worked in a number of places. The opening which is worked most extensively at the present time is that recently opened by the Reese-Hammond Fire Brick Co. on the point of the hill overlooking the West Penn Railroad, to which there is an inclined railway direct from the clay quarry. Clay was formerly mined at this point from shallow drifts or underground workings, but the company is now removing the overburden and quarrying from the surface. At first only the high grade clay was used, the other being thrown over the dump, but the new paving and building brick works utilizes all or at least the greater part of the material in the different grades of brick. The present face shows about twenty-two feet of flint clay, the upper few feet containing much iron, overlain by four or five feet of plastic clay, followed by seven to eight feet of coal. There is a thickness of three to four feet of plastic clay underneath the flint clay, which, with that overlying, is now used for building and paving brick. The coal is of good quality, and can all be used in the works. At present the coal is mined two or three hundred yards further north, where it has a better roof. It is brought on a tramway to the clay mine and lowered to the railway on the same incline as the clay. Part of the material overlying the coal can be used, and the only limit to the extent of the surface workings will be a thickness of the overlying sandstone too great to be removed economically, only sandy soil and bowlders having been removed so far. However, should this overlying sandstone prove to be good building stone or even good ganister for siliceous brick it may more than pay for its removal. Under any condition the supply of material is scarcely limited, as the supply obtainable by extending the work along the slope is almost inexhaustible, to say nothing of the possibilities by mining underground.

A few hundred yards north of east from the above clay quarry along the southeast slope of Chestnut Ridge are three other underground mines of flint clay. The one the farthest away is known as the David Coulter mine, from which the clay was shipped to Lockport for gas retorts. It has been idle for fifteen years, since Mr. Coulter opened his mine on the other side of the hill. The other two mines between Coulter's and the railroad belong to the Reese-Hammond Fire Brick Co., their Nos. 1 and 2, and were originally known as the Robinson mine and McCartney's mine. The clay from the mines when they were first opened was hauled by wagon to the works at Bolivar, but the coal mine of the No. 3 works described above has been driven through the hill, and the clay from Nos. 1 and 2 mines is now hauled through the hill, through this coal mine, and sent down the incline to the railway from the No. 3 mine.


View of the flint fire-clay quarry on the King property, Bolivar, Pa. The clay was formerly mined in drifts, remnants of which

Probably the oldest flint clay mine on the north (east) side of the river is that designated on the sketch as the Garfield flint clay. It lies about a mile east of Bolivar, and was originally operated by the Reese-Hammond Fire Brick Co., but is now operated by the Garfield Company. It is the same geological bed as the others described above, but, owing to the southeast dip of the strata, it lies much lower in the hill. This mine has been operated many years, and the clay has been removed from many acres. The clay is transported by wagon to the Garfield works.

David Coulter operates a flint clay mine in the same bed of clay near the top of the ridge on the south side of Roaring run.

Two other openings in the Bolivar flint clay on the north side of the river are now owned by the Reese-Hammond Fire Brick Co., but have been idle for many years on account of the cost of transporting the material to the works.

There is said to be a higher bed of flint clay called the upper Bolivar clay, which is found only in remnants, "pots," on the hilltops. It is reported to be highly refractory, but not worked on account of its scarcity.

The clay next in commercial importance is a bed of plastic clay about 200 feet below the flint clay. The thickness of the intervening strata, however, is not uniform, and varies considerably at different points. This bed furnishes practically all the plastic clay used at Bolivar, besides some shipped to other points, and is mined by all the companies above mentioned. Reese-Hammond Fire Brick Co. mine it in two places, one near the mouth of Tub Mill creek, on the south side of the river, and one on the north side of the river in the hill below their flint clay mine No. 3. The Garfield and the Lincoln companies each mine the clay near the Garfield works, both running their clay from the same opening under the railway. David Coulter mines it on the same hillside with his flint clay on Roaring run, at about 175 feet lower level, and runs it to the railway on the same tramway.

are shown on the face of the quarry. It is now worked from the surface. It is the Bolivar or Upper Freeport clay.

This bed of plastic clay really consists of two beds known locally as the upper soft clay and the lower vein, but in one opening, that of the Reese-Hammond Fire Brick Co. No. 4, on the north side of the river, the material between the two parts is sufficiently thin to permit the working of both beds together. In this mine the material between the two clay beds dwindles to but a few feet in thickness, and in places less than a foot, and consists of a thin layer of hard sandstone (ganister) and an impure sandy clay, but practically all the material is used for some purpose or other in the various kinds of brick. The sandstone is used for ganister and the clay mixed in with other clay for brick of low refractory power. In the other mines only the upper part of the clay, about six to eight feet thick lying above the sandstone and called the upper soft clay, is worked. This is said to be a good quality of plastic clay, and is used almost exclusively, although there is another bed between this and the flint clay overlying and one or two beds said to occur at a lower horizon. One of these lower beds has been tested and found to be less refractory, hence has not been used, but may be useful later in making vitrified brick.

The Bolivar clay is said to be not the best for certain grades of refractory ware where the heat is intense and continuous, so that some clay is imported from other points, some from South Fork and some from Blue Ball and Moshannon, in Clearfield county, and some ganister for the silica brick from Blair and Huntingdon counties, but the bulk of the products is made from native clay. Almost every grade of brick can be made from it by the proper selection and mixing of the clays that comes from experience.

The Bolivar clay, it is claimed, will make a more porous and elastic brick than other clays that stand a higher heat, which makes them adapted to uses where they are subject to frequent and sudden changes of temperature, such as puddling furnaces, pottery kilns and coke ovens. The elasticity of the coke oven brick is certainly severely tried when they are heated to a high temperature and cooled by having cold water from the hose turned on them.

Dr. Stevenson, in the Pennsylvania survey report* twenty years ago, says of the Bolivar clay: "The Bolivar clay has a wide reputation, and at one time the brick made from it were thought to be hardly inferior to those from the Mount Savage region." He further says that the high prices previous to the panic of 1873 caused a carelessness in selecting the clay that almost ruined their reputation. If one may judge from the growth and prosperity of the works at the present time, they have regained their good reputation, as the bricks are not only sold in large quantities in the State, but are widely shipped to distant States, and even to foreign countries.

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*J. J. Stevenson, 2d Pa. Geol. Survey Report KKK, 1877, p. 248.

Below we give the analyses of two of the clays used at Bolivar and one of the grades of fire brick.

ANALYSES OF BOLIVAR FIRE CLAY AND BRICK.

	1.	2.	3.
Silica, SiO_2	43.46	63.81	53.08
Alumina, Al_2O_3	41.61	26.39	43.41
Ferric oxide, Fe_2O_3	1.03	1.23	2.44
Lime, CaO	.24	trace.	.33
Magnesia, MgO	.09	trace.	.18
Loss on ignition	13.29	9.12	.26
Total	99.71	100.75	99.70

No. 1. Flint fire clay from South Fork, Cambria county.

No. 2. Westmoreland county flint fire clay, King mine of Reese, Hammond & Co.

No. 3. The "Acme" fire brick made by Reese, Hammond & Co.

All the analyses were made in the chemical laboratory at State College, Pa.

The Bolivar flint fire clay is the same geological age as that which has been mined and used extensively at Connellsville, Hunker Station, Salina and elsewhere in Pennsylvania, and is thought to be the same age as the Mt. Savage clay in Maryland.

(Concluded next month.)

View of Bolivar, Pa., looking up the Conemaugh Valley. The town is at the right.

BUTTON-HOLE TALKS.

"YEAR AFTER YEAR have I attended these Conventions, but never once have I addressed the chairman or opened my mouth in a discussion in the Convention, not even to yawn. Notwithstanding this, I claim I get great good from the Convention. Looks selfish, doesn't it? You think me a sponge, and that I always absorb and never give up. Don't judge me too quickly. I simply cannot talk in public. It is an utter impossibility for me to do so, and, besides that, there is no necessity, for there are plenty who can, and who are fighting for the floor all the time of the session.

"I do pride myself, though, that I have never missed an opportunity to help a brother along. While I cannot impart any ideas to a whole lot of men in a collective body, still I can tell them all I know one at a time. Now that I have you, I want to tell you one thing that I do believe in most emphatically, and it is a matter that puzzles me not a little that so many seem to look at it in such a different light.

"If a member of my family is ill I send for a doctor—just hunt the best I can find, and get him quick. If I get caught in a legal complication I do the same thing, only I get a lawyer. I use my judgment as to the standing and skill of each and as to the field of each. I don't send for the lawyer when we have sickness nor for the doctor when we get into trouble, but I get each when we have need of talent in his particular line, and by this means we get just the right help and we get it at just the time we need it. Of course, I pay a good price, but I pay it cheerfully, for I certainly get value received as thoroughly as I ever do. I cannot afford to hire the exclusive services of a good doctor nor to employ a smart lawyer to give me all his time, but I do not, therefore, deprive myself of their services entirely. Each of these men may require many thousands of dollars a year for his services, and may be well worth it, too, so that you see he would be way out beyond my horizon. I could not begin to pay him for all his time, but I can, and I very willingly do, pay him a good price for just the little bit of his time that I do need, given me at just the particular time of my need, and it is good policy for me to do so.

"Now, I do the same thing in my clayworking, but I really can't understand why there are so few others who do so. The art has really now reached a position where there are skilled men to whom we may go. In the past there have really been but few men proficient in the art and really skilled to give valuable information, and what few there were have devoted their entire time to one establishment, but this is no longer the situation. Note the talent in the new Ceramic Society. Just look at Professor Orton and the way he answers questions. Do you think any man ever paid him for his opinion in which he did not get his money's worth? Well, I guess not.

"There was a period, however, when the so-called scientific information attainable ended with furnishing the inquiring clayworker with a technical analysis of his clay and pocketing a fee. In that case nothing but the technical analysis was given, probably because nothing more was known by the scientist, and the second stage of that particular clayworker was worse than the first, because he felt he had been 'flimflammed' and that the 'scientist' and the 'gold brick man' were cousins.

"The scientific men we now have are not at all of this class, and when I get stumped, and at the end of my string, I go to them for relief, and I get it. I pay my money to them just as cheerfully as to my doctor or lawyer, and the results satisfy me fully. In a great measure it puts me even with the big manufacturer. I predict that this will be much more general in the future, and will lead to immeasurable advancement all along the line."

GATES.

Written for the CLAY-WORKER.

CAPITAL BRICKS AND BUSINESS.

WHEN THE CAPITAL CITY began to wake from its winter torpor the hope of prosperity began to stir with the new life of spring; and now this hope seems blooming with the flowers that, with things of vernal nature, give to Washington the charm of its most beautiful season. Business is "looking up," building is going on in many parts of the city and district, and the brickmakers are producing and selling their product.

It is safe to say that this year is to be a prosperous one in the District of Columbia. This opinion is based upon the fact that Congress appropriated a great deal of money for government work in this city; that great street railway enterprises are being carried out, and that there is a general feeling that times are improving. In the matter of Congressional help to the brickmakers, builders and workers, it may be mentioned that that distinguished body gave, of the $1,500-000,000 appropriated, over $4,000,000 for buildings, etc., in the District.

Two millions of this good-sized amount of money are to be used for the new addition to the Government Printing Office, which, when completed, will lead the world in printing establishments, in size as well as equipment; in the latter particular it is ahead now. For a new building for the Department of Justice $1,000,000 will be expended; $25,000 will go to the weather bureau for an addition to its quarters; $250,000 are to be spent on new school buildings, and $205,000 in buildings and repairs at the navy yard. These large sums of money given by the government for buildings and additions to such in Washington can be added to by the $200,000 for new sewer, and $275,000 for the new library building given by Mr. Andrew Carnegie.

Of course, it will take some little time to prepare plans and get this money into circulation. That for the navy yard is being partly utilized in a large addition to the north gun shop, in the construction of which many thousands of red brick are being used. The experimental model tank building at the yard is completed, and presents a unique feature in brick structures. It is 500 feet long, fifty feet wide, and about twenty-five feet high at the apex of the sharp gabled roof, along nearly the full length of which extends a skylight. Inside, a tank forty feet wide, and filled with water, runs from one end of the house to the other, excepting a space of about ten feet at each end. This miniature lake is spanded by an electrically-operated carriage, which tows the ship model experimented with at from four to thirty knots an hour. While this is being done, automatic mechanism, arranged on the towing carriage, registers the action of the model, in speed resistance, giving electric power required, and, altogether, furnishing valuable data to be used in making comparative estimates between the action of the model and that of the ship to be built on the same lines. Congress appropriated more than $90,000 for the model tank, but the cost has exceeded this amount considerably.

As I remarked above, it takes time for the government to get money for buildings in circulation. The best illustration of this, perhaps, is in connection with the building operations of the Treasury Department, as conducted in the department directed by the supervising architect.

When a building is to be constructed by this department, a plan of the intended structure is submitted to a board composed of the secretaries of the Treasury and Interior and the Postmaster-General. After this, specifications are written and duplicates of drawings made, to be used by bidding contractors; the work is advertised and the contract given to the lowest responsible bidder. When all the initial steps have been taken, the Secretary of the Treasury appoints a superintendent of construction, who keeps fully informed as to the progress of the work and sees that everything is done according to plan. As the work goes on, the contractor can collect each month 90 per cent. of the value of what is accomplished, this amount being paid when proper voucher is made out, certified by the superintendent of construction and approved by the Secretary of the Treasury. In government work a great deal of red tape is seemingly necessary. But notwithstanding this, the contractor is always willing to put up with the tape when there is a fat government "tape-worm" in view.

The money to be spent by the government for buildings in Washington will only be part of the needed cash that ere long must go to contractors, builders and their help in this city. A large powerhouse, for furnishing electric current to several street railways, is to be built, its location being not far from the Capitol. The ground for this was purchased not long ago at a cost of nearly $400,000. Another big deal, which gives an idea of the value of Washington real estate, includes one in which $30 per square foot, aggregating $185,000, were paid. Several apartment houses—one of them costing $150,000—will soon be begun. The finest of these will be faced with cream-colored brick and brown stone, and plate glass show windows will be one of the attractive features. The apartment house is steadily gaining ground in this city— and there is no reason why it should not, as it is so well adapted to the needs of small families, and is an economizer in cash and in household labor.

JOHN MILLER, Brickmaker, Washington, D. C.

Building operations this season will include two or more churches in the city, while outside, in the District, a Catholic brotherhood are having built a large brick structure for their home. The immense Franciscan monastery in this neighborhood, with shrines representing various sacred features in the Holy Land, is nearly completed. It took a vast number of the brickmaker's produce to build it, and is, possibly, larger than any brick structure (excepting the Pension Office) in or near Washington.

On the northwest of and some miles from this city, the Methodists will in time carry out their extensive plans concerning the American University. At present there is one building there erected at a cost of $200,000. The whole number of structures to be built is twenty, and the amount required to carry out the plans is estimated at $5,000,000. This university has been planned on magnificent lines in buildings, architectural features and grounds, and in its endowment, which has been placed at the $20,000,000 mark. This is an immense amount of money to raise; but the great interest taken in the enterprise and the amounts that are coming in for it go far to justify the hope and expectation of the projectors.

The American University property comprises a tract of forty-five acres on Georgetown Heights, and is most admirably situated for the purpose intended. A great deal of work has already been done toward beautifying the place, and trees, shrubs and artistically laid-out grounds make it even now a most charming spot. The various halls and colleges will face on large, quadrangular spaces, one extending north and south, the other east and west. There will be for the benefit of students, grounds for baseball, football, tennis, etc., and a fine gymnasium will be provided. If the plans of the University are carried out it will undoubtedly be one of the finest in the country.

From all indications building operations in the District of Columbia this year will far exceed those of 1898. From the District Commissioner's report I find that during the latter year there were something over 1,100 building permits issued, and about the same number for repairs. Of these, 573 were for brick dwellings, twenty-five for brick stores and eight for brick stables. The number for frame dwellings was 126. These were for houses erected in suburban towns near the city.

I will close this letter by saying to the readers of THE CLAY-WORKER that if they will come to our beautiful city for the national peace jubilee they can see that the capital is growing rapidly, and also the festivities, which are to be conducted upon a grand scale, in commemoration of the time when the Spaniard concluded he had enough.

NICODEMUS.

Written for the CLAY-WORKER.

FRIT KILNS.

S. GEYSBEEK.

IN THE POTTERY INDUSTRY we find many methods and machines which are used year after year without any improvement whatever. When we look the pottery history up we find that improvements seem to be some unknown mystery, and by old pictures and descriptions we are aware that we are making pottery just as did our fathers and grandfathers. Improvements in the practical application of the art, science and skill in connection with our industry are of very recent date, and the majority of the practical potters lacks even at the present the knowledge of such improvements. We blunge the clay in the same old-fashioned way; we never tried to improve our pug mills. The jiggers and potters' wheels have undergone some slight improvements. Dipping and glazing is still done in the same way as two hundred years ago. Burning kilns does not materially change from the old Chinese method.

The improvements of other industries are great and many. Introduction of entirely new ideas in certain industries has altogether upset the old-fashioned way of manufacturing. We are glad to state that we find in one branch of our ceramic industry, the brick and terra cotta industry, more improvements have been made than in the pottery industry.

Why do we not find modern improvements in our pottery industry? The question is easily asked, but not readily answered. Many potters, however, could easily solve for themselves more accurately that question than we can. It would not be advisable to go into details in regard to this question, as it does not fall within the scope of this paper. We will confine ourselves for this time to an improvement in pottery which will be adopted sooner or later in most of our ceramic establishments. Only a few of them are at present equipped with this new improvement, and these, which will hold their place in the race of competition, are certainly the first to adopt it. We have in view frit kilns.

Under ordinary circumstances some parts of the glaze mixture are separately melted together in saggers. These are put in the glost or biscuit kiln and burned. After burning, this mixture will be a hard glass cake. The process is called "fritting," and the result is a "frit." The frit in this state is very hard to reduce to powder. The saggers used for fritting are usually lined on the inside with a coating of flint about one-half of an inch thick, or washed with some kaolin slip about one-eighth of an inch in thickness, in order to prevent the incorporation into the frit of foreign materials from the sagger body. As some of this lining will stick to the frit after burning, it is necessary to remove this before the frit is crushed and ground for use.

In every instance the breaking of the sagger is a necessity in order to get the frit out of it. The sagger becomes worthless. It cannot be used for making grog for new saggers.

As fritting is a necessity for glazes, which contain ingredients soluble in water, the process of fritting cannot be done away with. We go to a great expense, and obtain small returns. We not only lose the sagger, but we lose frit at the same time. We expose the frit for a duration of from 24 to 36 hours to an intense heat, which will volatilize some of the ingredients which compose the frit. The gradual cooling of this frit in the kiln gives it a more resisting power to the blows of the hammer in the operation of reducing it to powder than when we suddenly take the molten mass and chill it in water.

It will be plainly understood that this method of fritting is expensive, and that we had to find some other methods by which we could save expenses. The objections to fritting in saggers are combined in the following three main points:

First. Loss of frit material (by volatilization).

Second. Loss of power (by reducing the frit to powder).

Third. Loss of saggers (by breaking up).

These three objections could be called at the same time the defects of the process.

In order to overcome these defects we must devise ways and means which will work satisfactorily and are not subjected to any of the three objections.

Loss of material could be overcome by exposing the frit ingredient to such a heat and for such a length of time as would be necessary to melt the ingredient into a glasslike mass. After the ingredients are melted together an increase of heat works injuriously on the frit, we will have to stop firing or withdraw the frit from the heat. In stopping the firing we would be limited as to the size of our output, and we would create a new objection or defect, as we lose heat, while we would have to start new fires every time as we would recharge frit mixture. By withdrawing the melted frit from the fire, and making room for another portion of the frit mixture, we would obtain a continuous process without any loss of heat. We will have to use constant heat and quick cooling.

Loss of power would be prevented by cooling the melted mass in water; it will chill quick, becomes brittle, and is very easy to grind. It could therefore be so arranged that the molten glass mass, by withdrawing it from the fire, could be cooled down in a basin of water, and in this way be chilled quickly.

Loss of saggers could be saved by using stationary frit basins or crucibles, which are so arranged that they could be used and heated over and over again.

In the next paper we will put these ideas together and illustrate the different styles of modern, common sense, and up to date frit kilns.

It isn't what a man really does, but the way it is advertised that makes him great.—Puck.

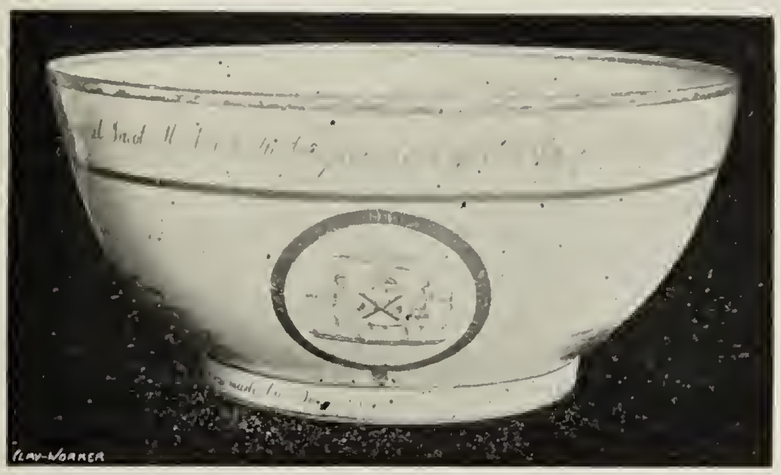
Written for The Clay-Worker.

A REMARKABLE OLD PUNCH BOWL.

MRS. MARY E. NEALY.

IN CITY HALL, NEW YORK, in the care of Mr. Martin J. Keese, is the great punch bowl presented to the city of New York by General Jacob Morton July 12, 1812. The presentation in gold script is given between the lines which decorate the upper and outer edge of the bowl: "Presented to the corporation of the city of New York by General Jacob Morton July 12, 1812." These words occupy half of the circle of the vessel, and are repeated upon the opposite side.

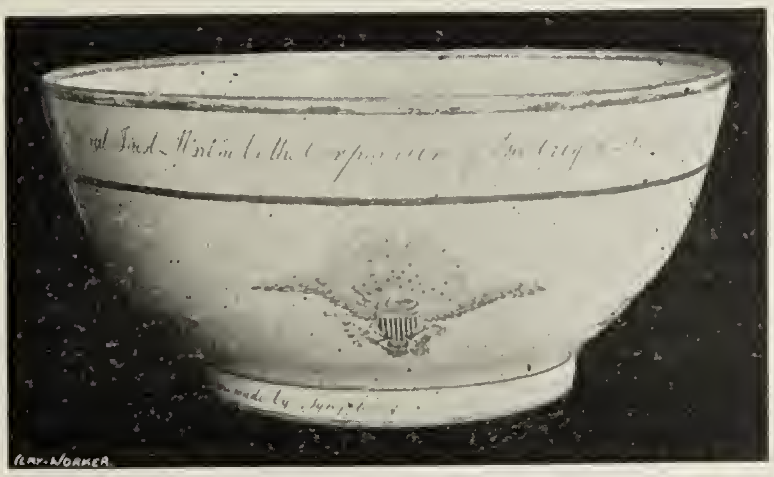
Between like stripes upon the inner side is this inscription, also repeated to fill the circle: "Drink deep. You will preserve the city and encourage canals." Upon the lower rim of the bowl are these words. This bowl was made by Synchong, in Canton, Fung-Man-He. This also is repeated upon the opposite side. The bowl is decorated outside with pictures of "a shipyard with men working" and a "sea view with three sailing vessels." Between these are the old "coat-of-arms of New York city," and the "United States arms, eagle and motto, with nineteen stars."



The interior of the bowl below the gold lines is entirely filled with a "view of New York from Brooklyn," which makes a fine decoration.

This is made in heavy stone china, and is one of the largest punch bowls known, being twenty-one inches in diameter, ten inches deep, and twelve inches at the base.

It has been used upon many public occasions at banquets and dinners given by officials. I am indebted to Mr. Keese, custodian of the city hall, for the privilege of using the celebrated bowl as one of my illustrations.



There are a large number of historical old portraits of the most distinguished American heroes and statesmen in this old building, and in the care of Mr. Keese, though, as they are in a room not easy of access, and later works of art are more to be admired, they are seldom visited.

The first cut shows the "profile of the bowl with the arms of the city of New York," the second "a profile of punch bowl with United States arms," and the third "view of New York from Brooklyn."

UNCLE SAM'S HANDSOME GIFT FROM THE FRENCH GOVERNMENT.

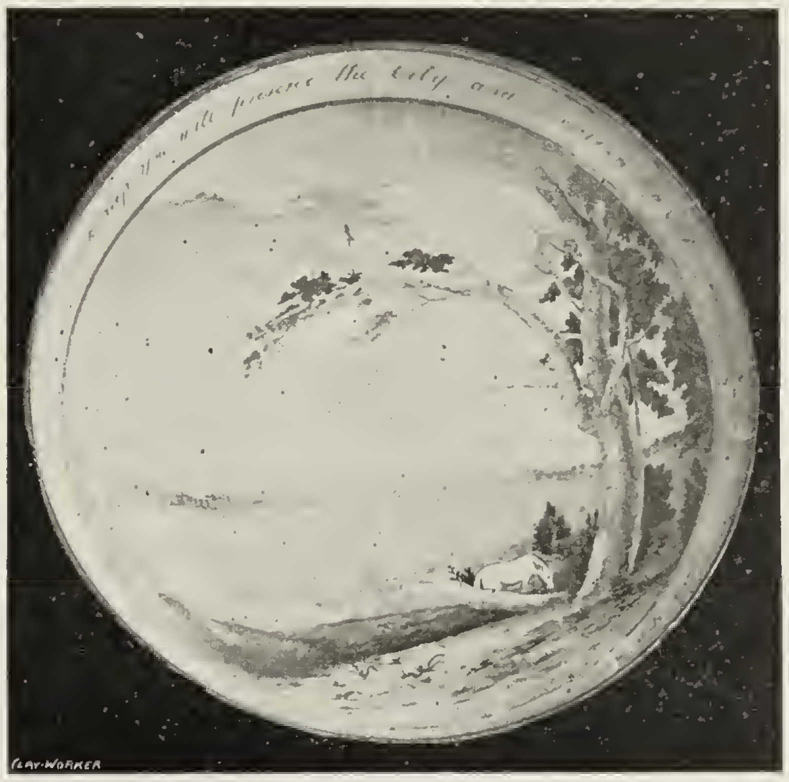
TWO MAGNIFICENT SEVRES VASES SIX FEET HIGH.

A notable ceremony occurred at the blue room of the executive mansion at Washington, April 8, when the French ambassador, M. Cambon, presented to the government and the American people, through President McKinley, two magnificent Sevres vases from the French national pottery at Sevres.

The gift was from the late President of the French republic, Felix Faure, and commemorated the opening of the new Franco-American cable on Aug. 17 last, when President McKinley and President Faure exchanged the first message over the new line between the White House and the Palace of the Elysee.

The vases and pedestals stand six or eight feet high, and are of a deep blue, characteristic of the finest Sevres ware, as well as in happy accord with the prevailing colors of the blue room.

The presentation was made the occasion for a happy exchange of international greetings, M. Cambon making an address, and the President responding. M. Cambon was accompanied by the entire staff of the embassy, including MM. Thiebault, Taigny, Boenfve, Maj. De Grandprey, and Lieut. De Faramond, and M. Lurienne of the French Cable Company.



Interior Decoration of City Hall Punch Bowl.

The President was accompanied by Secretary Hay, and some of the officials of the household. The vases had already been placed in position, one on either side of the large window looking toward the Potomac. They far exceed in elegance anything in the way of porcelain hitherto brought to the White House.

The Sevres factory is a government institution situated near Paris, on the banks of the Seine, half way between Paris and Marseilles. It was created by Louis XV, because the soil furnished a porcelain clay entirely unique in the modeling of fine articles. Ever since the time of Louis XV., the factory has been protected by French rulers. The most prominent artists in France, both painters and sculptors, have been attached to this factory. There is probably not a royal palace in Europe that does not possess one or more celebrated specimens of the Sevres ware, such as vases or table services, and the White House itself possesses a Sevres service, which alway appears at the state dinners given by the President.

The vases will now remain a permanent possession of the White House, along with several other notable decorations given by foreign governments. If they had been given personally to President McKinley, it would have required an act of Congress for their acceptance, but as a gift to the American people, no special act is required, and they remain one of the fixed possessions of the White House.

Written for the CLAY-WORKER.

WHAT KILN SHALL I BUILD? No. 5.

IN OUR LAST PAPER we treated of kiln crowns, and more especially of the crowns of round kilns. Some few points should be referred to before we leave this subject for the benefit of those who would perhaps like to construct their own kilns.

The essential points are:

First. The proper start from a solid and even foundation, as referred to in our last paper.

Second. A properly shaped skew back or springer.

Third. A properly shaped brick for the crown, and here let us say that a brick cut for a 25-foot kiln will do excellent duty for either a 24 or 26-foot kiln.

Fourth. The top band of the kiln, which supports the weight and thrust of the crown should not be scrimped, as such bands often are. We have just been examining some 30-foot diameter of kilns for burning paving brick, the crowns of which were low, and yet top bands of but 5x5-16 inches were used. We noticed a splitting and giving way of the band of one kiln in two places. The top band for such a kiln should not have been less than 6x3-8 inches, in our judgment. We feel like recommending to kiln builders the cast iron clamps now so generally used by tank builders for windmill purposes, and to be seen on all railroad water tanks of late construction. These are made of all sizes, and there is real economy in their use for kilns. There is no blacksmithing needed in their application, and the band is left in its full strength and is so held as to insure an even strain upon it.

Fifth. Great pains should be taken to give the crown *a perfect form*—that is to say, it should be a segment of a perfect circle. This may, perhaps, be the easiest secured by placing a staff at the exact center of the kiln sturdy enough to hold evenly arms to be used as trammels revolving on the staff to properly gauge the setting at every point.

No doubt many crowns laid fail in good service and are comparatively short lived, because imperfect in this regard and from excessive thickness of the mortar joints. Every brick laid in a crown should be so thoroughly seated upon the course below it that there shall be no danger of its changing its position later.

We have now come to a point which we feel warranted in pressing upon the attention of every kiln builder who has not his kilns under cover, and who does not utilize the waste heat from them for drying purposes. This was just touched upon in passing in our last paper. How thinking men ever came to adopt so wasteful a course of action as is seen in the laying of a single course of brick in a kiln crown, especially in our Northern climate, is more than we are able to account for. We have already stated that crowns, as generally laid, have not over half the thickness of the kiln wall, and usually much less than this. Is this because that in the minds of kiln builders the chief function sought in thickness of wall is supposed to have reference to sustaining the crown rather than for the retention of heat? There is no other way of finding an explanation for the thin crown. The fire brick usually used in a crown are more porous than the courses of common brick that compose the outer wall, and hence more readily give passage to the escaping heat or its neutralization by exterior cold.

It is well known that water can be blown through the shorter diameter of an ordinary brick by using the mouth as a bellows, and this is one of a class of facts to be kept in mind by a kiln builder.

A GREAT WASTE OF FUEL.

Perhaps we can the more readily fix upon the minds of our readers what we desire should be permanently impressed, by making a statement of what has the past week come to our notice. We were looking into a recently opened kiln then about cool enough for unloading. The first sight was one to satisfy the ambition of any manager, showing a uniform color and burn from top to bottom. Stepping around to the other side of the same kiln an entirely different sight was presented. The burned wares from bottom to top of the doorway, and as far as could be seen, were hardly a shade off the color of the dry clay wares as they entered the kiln. Observing men will be ready with an explanation, no doubt, for it is not a very uncommon phenomena, the explanation being that the side last viewed had been exposed to a strong March wind. We noticed that while the walls of the kiln were about 18 inches thick above the furnaces, that the walls which had stopped up the door arches had been but 12 to 14 inches thick. What had the wind done? While at a temperature only about freezing point it had beaten against a solid brick wall 12 inches and upward in thickness, and had subtracted from the kiln at that point enough heat to produce the effect we have stated. Why not apply this lesson of loss? Is it not evident that the wind sweeping over our thin kiln crowns licks up great and constant volumes of heat, and, could we but see it, as continuous a stream of heat as wide as the crown itself is being carried away on the breath of the wind as there is a continuous stream of flame and heat passing up the fire bags.

We do not miss this heat from the crown, as there is no evidence of it in unburned wares at the top of the kiln when opened, but we do notice that an extra demand has been made upon the fuel pile during the prevalence of a high wind, and *most of the loss* has certainly been through the crown and not the sides. Were the wares at the crown as telltale as those at the windward side of the wall this great source of loss would have been stopped long ago. Now, what is true of the loss of heat from a kiln under a strong breeze is, to a very large extent, true in any weather, and why this loss is mainly through the crown has been explained. Heat naturally seeks the highest attainable point, and hence leaves the bags to first beat against the crown, there to yield up a per cent. of its value—who shall say how much?—as its tribute to improper construction. It is always saying to the outside temperature, whatever that may be, "I'll meet you more than half way," and it keeps its word. Why, then, should we not always

GIVE OUR KILN CROWNS AN OUTER COVERING?

This is sometimes done, but when done bats of any character, hard or soft, are deemed good enough to answer the purpose. While nothing in the shape of burned clay suited to a covering should be esteemed too good. We would like to suggest to managers of plants who keep tally of fuel burned in each separate kiln—and every one should do this—the careful covering of the crown of at least one kiln, and then a careful observation as to the results in fuel saving, etc.

Permit us to present a further suggestion in the line of the experimental, which may be perhaps considered an innovation. We do not know that it has any precedent to appeal to in confirmation of its probable value, but we are sure the study of it will not be without value, and our readers will please consider this merely as an invitation to sit down and do a little thinking with us over the question of *what is the best method* of procedure in covering a kiln crown? We will all agree, I am sure, on the proposition that a kiln crown is constructed solely and for the one and only purpose of holding heat until it can be utilized to accomplish the work for which we create it. We are considering the kiln now as merely a receptacle for and a consumer of heat, and not as a heat producer; that will come later.

Two things have to do with the construction of a heat reservoir, which our kiln is—*first*, the character of the material, and, *second*, the form this material is given and the way it is joined together. As to the first we select clay because we know of nothing equally serviceable, and we select the kind of clay that will best meet our requirements. Granite would not do, even if it could be had more cheaply, because, first, it would crumble under the heat, and, even though right in this regard, experiments have shown that 60 to 70 per cent. more heat will pass through it than through a brick wall of the same thickness. Hence, it would fail in retaining heat for service. There is a great difference, too, in clay as found in brick in this regard. What is needful for an outside or weather course should be more of the character of a paver—a close texture and not a porous one. For a middle course the latter is, no doubt, superior. The reason for this is obvious. The vitrified course will exclude the onslaught of the wind as the porous brick will not, while the latter is superior to the former because a better nonconductor of quiescent heat.

LET US LEARN A LESSON

From the report of the results of some experiments reported in a well-known building journal. We cannot vouch for the statements, and the authority is not given. We accept them, however, as agreeing in general with other data. We only quote from this table of experiments so much as will serve our needs. The experiments were made with a view to determining the relative value of building materials as transmitting heat or cold.

"One square foot of glass will lose as much heat as six square feet of brick wall" (thickness not given). (Please remember that the thickness of the glass, however, is but about 1-150th that of a 12-inch brick wall.—Ed.)

"If double sashes are used, 75 per cent. less heat will be lost than with the single sash." [Note.—It will be seen that a square foot of glass but 1-75th the thickness of a brick wall, with an intermediate air chamber of an inch or more, will lose only as much heat as 1½ square feet of brick wall.] Again—and our brickmakers will hardly accept this statement without challenge—"A frame building, plastered on the inside and covered with paper felt and sheathing on the outside, will lose 75 per cent. less heat than a brick wall of the same thickness." (This would be against a 6-inch brick wall if such a wall were possible.) These quotations will serve to show that the *form* of the material employed has much to do with its efficiency.

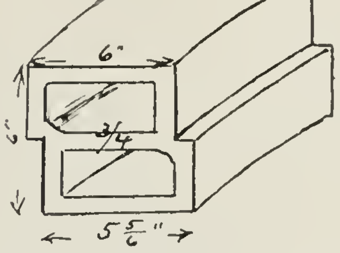
Now let us apply the lesson to the construction of a kiln crown. It will hardly be expected that, having in a former paper suggested the value of chambered kiln walls, we should fail in suggesting the same feature in the crown.

There are two ways of securing such a result: first, by laying the usual crown of fire brick and then covering it with another crown of common brick, leaving an air chamber between. There is much to be said in favor of a double crown aside from noting its value as a conserver of heat, for the covering crown should also be an important protection to the lower crown and add greatly to its life, and why? First, the inner crown, not being subject to the outside temperature, will not suffer the extremes in the temperature of its inner and outer surfaces, and hence in expanding and contracting will deteriorate less. Second, the outside crown, being practically unaffected by heat, will remain intact as against the effects of expansion, and consequently will prove a perfect and durable weather protector, while the intervening air chamber serves the purpose of a nonconducting medium.

IS THERE ANY BETTER WAY?

We have referred to a second method, and here is where our suggestion that you consider with us an innovation comes in. It is purely a question of the *best form* to be given a crown covering material. The inner crown of a 25-foot kiln having a 4-foot rise, if of brick 8 inches long (which should be long enough if the crown is covered), will weigh about 25 tons, while a hollow block covering crown made of any good, tough, plastic clay, and given the form and dimensions shown in Fig. 1, would weigh but about one-half as much, and would impose upon the kiln walls none of the strain which the thrust of expansion would give. Hence it would be but one-half the burden to the kiln walls that a solid upper crown would impose. In Fig. 2 we show how these two crowns may be laid, as related to each other, being a cross-section view of the skew backs and portions of the two crowns. Some may see difficulty in making such hollow covering blocks. Made of any tough, plastic clay that can be given a hard burn, and that will work freely in an auger machine, the required radial lines shown in the cross section of the block are secured in the form of the die. Blocks may be cut to the desired length, say 12 to 15 inches, in the usual manner as they emerge from the die. These, laid on to an adjustable bending and cutting form, may, without any special skill, be given the curve and radial cut needed for the course they are to occupy in the crown, and they may be easily handled in drying and burning. It may be asked whether such blocks will possess the requisite strength. A computation of the weight of such crown on a 25-foot diameter of kiln shows that a weight of but about 600 pounds would be imposed upon each running foot at the skew back, while such a clay as has been mentioned ought to support a weight twenty times as great. Each block in the crown may be made to represent 10 to 12 ordinary sized brick at the upper surface as commonly used in laying crowns. (When a covering course of brick is laid it is usually on the flat side.) Such blocks would only require to have ends and sides dipped in a batter of clay mortar of proper consistency, but for better weather protection hydraulic cement might be used, as the heat to which they would be subject would not injure the cement. As seen in Fig. 1 the block is made of such form as to seat each block forming a course upon the course previously laid. This seat would facilitate a correct laying without resort to other help until a point should be reached in the flatter portion of the crown where short wood strips of the height of the chamber between it and the other crown could be laid on that crown, supporting the course until properly keyed, and then removed for the laying of the next course. After laying, such a covering crown could be treated with a coating of cement mortar to render it weather proof, with little probable demand for future attention. Let us ask if there is any reason why such a crown, modified if you please to suit the builder, but a crown constructed on the general principles outlined, should not be expected to pay for itself in the savings of a single season. Most of our cupolas and furnaces for melting iron and other metals employ *clay blocks* rather than brick for this purpose, and the decided advantages accruing from the use of larger units should cause the kiln builder to consider how this decrease in the number of joints may be secured in kiln construction.

Fig 1



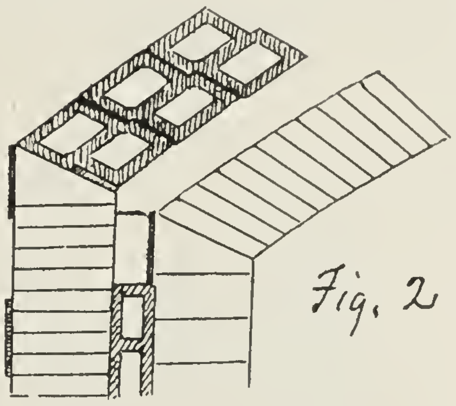


Fig. 2

When it comes to the application of a proper crown and crown cover to a square kiln the problem is greatly simplified, there being only such radial lines as are secured in the molding of the material, and no requirement in the way of bending blocks forming the covering course, the lower course supported by the usual frame work used in arch construction, and the upper course being supported by wood strips representing the height of the intervening chamber, removed as each course of blocks is keyed.

Aside from emphasizing the need of top bands sufficiently strong to sustain without question the weight and thrust of the crown (and the latter is by far the most important factor), we have said nothing of the iron framework needed for kilns. The rule should be bands amply strong and enough of them, properly secured at the door arches in such manner as not to weaken the band at that point, keeping in mind the fact that the band will be no stronger than at its weakest point. When it comes to square kilns, even more skill and judgment would seem to be required. There are no hard and fast rules that can be given. We have seen some modern kilns of large size that have not seemed overprovided for with a pair of 12-inch eye beams as a backing for the strain imposed on the rods, and these placed at not infrequent intervals.

Probably as satisfactory and economical a method as is employed on kilns of ordinary size and type is found in the use of a pair of old railroad track rails, used in the same manner as the eye beams when employed for the same purpose. These should be placed between each furnace and as frequently at the kiln ends. A cast saddle or head block, so shaped as to hold the rails in position, i. e., just far enough apart for the strain rod to pass between them, and having a hole for the passage of the strain rod, is a necessary feature. As much care should be used in securing the rails at the bottom as at the top, making sure that the bottom rods (if rods are used) are placed where heat will not unduly affect them. The top of the rail or eye-beam braces should be supported by masonry to the very point where the strain rod makes its demand, which, for the greatest efficiency, should be close to the crown top. What the keel and framework is to the boat, and the bony framework is to the animal body, all this is the iron framework to the kiln. A weakness here is fatal to long life and efficiency in either case.

FLAME.

Written for the CLAY-WORKER.

ARTIFICIAL DRYERS.

BY A MASTER MECHANIC.

SINCE DRYERS for clayware have come in general use and the expression we often heard eight or ten years ago in our conventions, "there is nothing cheaper or better for drying brick and tile than God's free air," has been proven to the contrary, many different plans have been tried, adopted and discarded. Naturally, the first idea in building dryers where the brick were put on cars was to follow the method of heating hot floors. Furnaces, with proper flues, were put under the tracks and direct firing used to heat the ware above them. As this was rather costly, excepting where natural gas was used at a low price, something better was demanded. In order to get cheap heat, the first step in the construction of dryers seemed to be to use waste steam from the engine. Soon, however, this was largely discarded for live steam, and additional boilers were put in to furnish the required heat. Why came this change? Was it because there was not enough heat in steam from the exhaust at forty to sixty pounds pressure to the square inch? It caused too much back pressure, and did not have the heating qualities. Live steam is the best, was the general verdict. Let us see now whether the fault was in th exhaust steam or in the construction of the dryers. We all know that so long as water is in the form of steam it has 212 degrees Fahr. of available heat. We also know that for heating buildings the steam pressure in the boiler is seldom more than four to six pounds, yet the heating qualities are perfect. This makes it apparent that the fault is not in the exhaust steam, but in the construction of the dryers.

What about the back pressure and consequent loss of power and corresponding fuel consumption? Let us consider this problem. First, with a properly constructed dryer, there should not be over a half pound of back pressure to the square inch. Second, what would be the loss of power on the engine? To make this plain, we will asume that the motive power is a steam engine of eighty horse power. The steam pressure in the boiler eighty pounds. This would give one horse power to every pound of steam pressure in the boiler. Now, as we said above, that in a properly constructed dryer, only a half pound of back pressure should be caused, the loss would be only a half horse power, or 1-160 of the whole—a mere bagatelle. A tight box or a badly aligned shaft would consume much more than that. In fact, it would not be noticed in the fuel consumption. This being the case, why not construct the dryers for utilizing the waste steam?

What are the real hindrances to the use of the exhaust steam in the dryers as now constructed? There are two principle defects. First, not enough heating surface. Second, too small steam radiating pipes used. Most of the dryers are made with one-inch pipes, while some builders put in pipes as large as one and a half inch, which comes somewhat nearer what it should be. Most of the dryers have the coils made to start from a header, then run back, a return is put on, then the pipe runs forward, then another return, until five or six of them are in the continuation of the coil until they run into a discharge header. This makes a pipe from two to four hundred feet in length. Others, again, use more pipes of the small diameter, running in headers at both ends. For a medium length dryer, these are about seventy feet long. Those conversant with steam engineering can readily see the great amount of friction there is in these small pipes of such lengths. High pressure steam has to be used to fill them properly, hence the back pressure on exhaust steam. Another detriment is the expansion and contraction and the many joints in these long pipes. There are nearly always leaks, which detract from the capacity of the dryers. All these drawbacks might lead us to the use of waste heat from the kilns. This is being very largely applied now. A special motor, generally a steam engine, drive a series of fans, which suck the heat from the kilns after they have been closed down, and drives it into the dryers. It is said this heat costs nothing, it would go to waste anyhow. Now let us give this our attention and look into its merits to see whether we can adopt it safely.

First, we have to have an engine or some other motor, which costs money and attention. Second, the air is often hot enough to set ties afire a foot above the conducting funnels from the kilns to the dryer. Third, it does not diffuse the heat in the dryer like radiated steam heat, but comes with a rush from one direction. This causes the ware to dry faster on one side than on the other. For tender clays it cannot be used safely. Another fact also is to be considered. We all remember how much has been said, and with truth, about making tough brick. Let them cool off slowly. Give them the annealing process. This, of course, is done away with when the heat is drawn away from them by means of fans.

After considering all these points we cannot help but acknowledge that a properly conducted dryer using the waste heat from the engine with very few joints and large circulaton for the steam would be the most economical and preferable.

BRICK WALKS.

Brick is certainly the best material we have for sidewalk paving or it would not be so extensively used. It is so well adapted to that purpose that almost any man with ordinary skill and judgment can put down a brick walk, and the wonder is that more walks are not constructed. There are other materials better adapted for sidewalks on business streets, where travel and traffic are heavy and continued. The asphalt and grandolithic or cement walks, and also sawed stone, are all more sightly and in keeping with the buildings erected on business streets. But we have in mind now the smaller towns and villages, places that are not subject to heavy travel, nor are they at all likely to be. The smaller towns are like the common people, very largely in the majority, and we feel that it would be the proper thing to do to encourage in every way possible an increased use of brick sidewalks.

It is a lamentable fact that our roadways in this country are all miserably made; foot roads, wagon roads and railroads are all built as if they were to be reconstructed or rebuilt entire in less than ten years. Villages spring up and have dotted the face of the country all over its whole extent, and from a glance at the map one is led to believe that there is no country on earth where its people can come and go over such a vast extent of territory with such ease and comfort as we "United Statesers." But this is a mistake. For several months of every year the people of the rural districts and smaller towns and villages are in a large measure cut off from the outside world. Right here is the great hindrance to a successful "rural delivery" of postal matter. If the roadways were in proper shape the question would very soon settle itself, and, happily, in favor of the rural districts. Good sidewalks in the towns and villages would insure free delivery in all of them first, and the remote places later. The villages having no sidewalks, the inhabitants are of necessity more or less isolated from each other, and there grows up a coldness or selfish neglect of each other which is not friendly or neighborly.

Brick walks are easily constructed, and, when put in place with any degree of permanency, remain in good condition indefinitely. There is an air of thrift and comfort on the outside of our homes where good brick walks are laid all around the house and grounds where travel and use require them.

Dig out the soil to the depth of eight inches, making your lines straight and level. Provided with an inch rope and with a very little practice, beautiful curves can be thrown into shape around corners, or to wind about the house among trees and shrubbery, and is a relief from harsh angles, besides being a more direct course. Fill in the trench with some material that will act as an absorbent of surface water; coarse sand and gravel or rough coal ashes and cinders are as good as anything; ram down hard and firm; level off; spread two inches of fine sand on top of this; sweep it level with a straightedge; draw a stout line as a guide for the outside course, and set it on edge, bedded deep enough to conform to the top of your walk; set up an edge brick every ten feet, and level or grade from point to point; lay your pavement carefully to this gauge, bricks laid flat and solid, set to the straightedge; finish on the outside with another edge course. Spread dry sand on top and let it remain on several days until all the crevices and spaces are filled with the sand, then sweep off, and show your neighbors what a fine thing it is to have a good brick walk, and urge them to do likewise. Then ask your local editor to copy these directions in his paper, advising property holders to note the increased comfort and value of our homes.—*Journal of Building.*

Written for the CLAY-WORKER.

BRICK PAVEMENTS IN CINCINNATI.

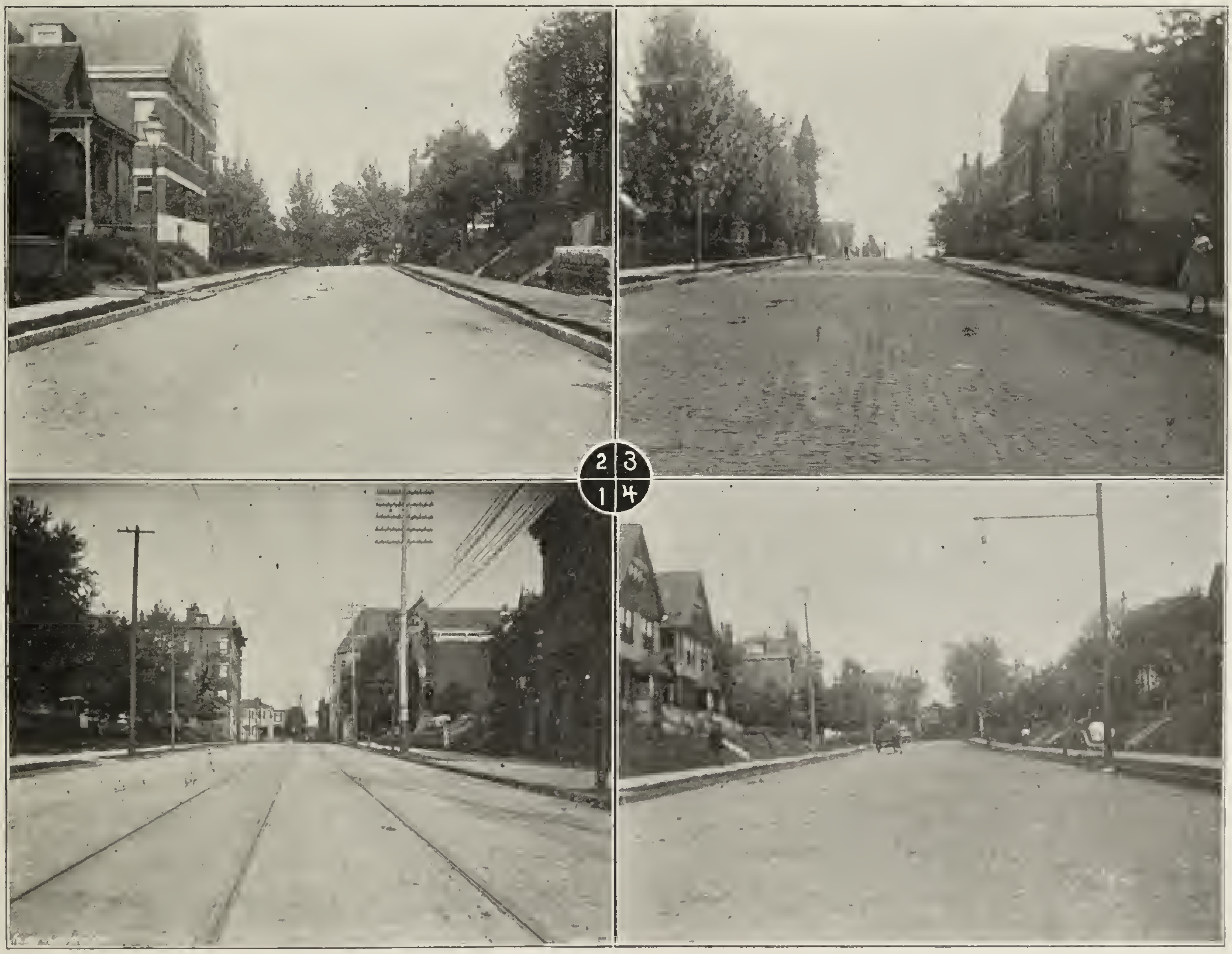
CINCINNATI has about thirty-nine miles of brick streets, the first being put down early in May of 1890. Most of these streets are now in perfect condition, as may be seen by the accompanying photographs. While in a few instances brick have not proven all that was expected, we have had no trouble in tracing the trouble, first, to bad materials, and, second, to improper laying of the brick in the street. In every instance where the brick have not been entirely satisfactory, they have developed an unsatisfactory condition within the first few months after they were put down. While these instances are comparatively few, they serve to show that the fault was either with the materials or laying. Observations show that if a brick-paved street endures the first few months of traffic without material injury that both the materials and method of laying the street can be relied upon as a permanent improvement.

It must also be remembered that brick streets always show more wear the first few weeks than at any other time. Especially is this so if the brick are inclined to be rough or unevenly laid in the streets. A street that may be somewhat rough at first soon becomes even and smooth, and, when thoroughly cleaned, will show very litttle signs of wear from year to year thereafter.

These are facts that the paving brick manufacturer must recognize and be prepared to meet. He must also realize that any street undergoes a certain amount of official as well as unofficial criticism the first few months which it does not have to endure later, and that all new things must be inspected by the general public. And, as brick show more wear the first few months than they are likely to show the first six years thereafter, it becomes necessary to provide against the first six months with care.

We believe one of the difficulties, though perhaps not so great in this city as in some others, is the want of a proper foundation. If brick are expected to wear equal to granite and asphalt, or better, they should have equally as good foundations. It is certainly a waste of time to put any kind of street pavements down on poor foundations, and brick offers no exception. While the manufacturers should insist upon proper foundations and proper workmanship in the laying of the brick, the cities should insist upon a well-made brick from the proper kind of materials.

Without mentioning names, we think we have instances in Cincinnati where poorly made brick, from poor materials, have



Some of Cincinnati's Brick Streets that have been down from Five to Eight years. 1. Upper End of Chappel St. 2. Fernwood St. 3. Klein Avenue. 4. Lincoln St.

been furnished at a reduced price, very much to the detriment of the paving brick industry, to say nothing of the losses to the city. While this is true of brick, it is also true of other street paving materials. But the brick, being a newer material, naturally is made to stand more than its shares of criticism.

We believe that city engineers, as a rule—in fact, with but few exceptions—are seeking for the best paving materials, all things considered. The "all things" include first cost, cost of repairs, durability, beauty, noise, comfort in traffic and good health.

The engineer who takes wisely all of these things into account must necessarily view the improving of every street from many standpoints.

The manufacturer who wishes to meet this many-sided question fairly must be prepared with a material calculated to meet every condition.

We believe that the streets of Cincinnati demonstrate that brick, properly made, which includes every detail from the clay bank to the street, and from the right kind of material, will come nearer filling all the requirements for the average street of a large city than any other materials now offered.

CINCINNATUS.

BRICK VS. FRAME BUILDINGS.

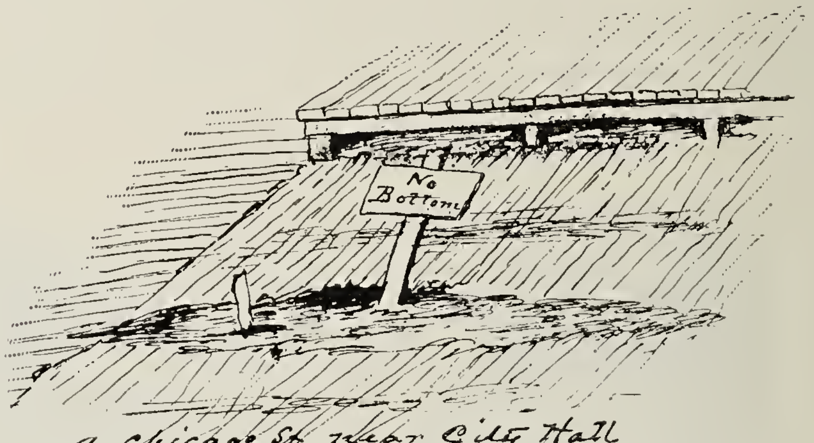
THE INTELLIGENT OBSERVER, if candid and able to disassociate sentiment and patriotism from clear, unprejudiced thinking, cannot but admit that the painted wooden architecture of our suburban and country towns falls far short of entirely satisfying. Not that our shingle and clapboard houses are not comfortable and warm, not that they do not meet the conditions of good living, not that they are not frequently good to look at. All this must be granted, but that they do lack that great essential quality of good architecture, namely, substantialness, permanence, is undeniable. Born as we are to the heritage of our wooden vernacular, we are prone to think it good and all-sufficient, and we naturally resent criticism of it, but as our view broadens, as we know other countries better, we come to realize that our chauvinistic tenacity to this national custom is blind and illogical, and not commensurate with our advance in other lines among the nations of the world. It is too much to expect, however, that this state of things can change all at once. Wooden architecture must for a long time—possibly always—be somewhat cheaper than any other, even if the present heedless slaughter of our forest trees be not checked, and a man of moderate means must either build a wooden house or no house at all. But architects have before them a wide field of missionary work in inducing their well to-do clients to build in something more enduring than wood. Perhaps it is not to be deplored that the greater part of the building of the last few generations is destined to early decay. Peace to its ashes. Our many wisely conducted schools of architecture, and intelligent study and travel, have now bred us a class of architects who are ready and able to change all this, and upon them depends the character of the work of the coming century. Brick and stone have always been and always will be the vehicles of the highest architectural expression of advanced civilization, as they are likewise the most indelible record of architectural progress. It is the especial province of the Brickbuilder to stimulate the use of brick and burned clay products. It entered the field of professional journalism for this express purpose, and it is gratifying to us to see already a sure awakening of architectural sense and conscience, and to know we are in the company of the wisest and ablest architects. From our intimate touch with them we know that amongst their clients there still exists much prejudice against the use of brick. The taste for inch boards, clapboards and paint dies hard, but it is surely waning. Not the least of the many virtues of brick is that, in substituting it for wood, much of the prettiness of our house architecture will become impossible, and the real beauty and picturesqueness of simplicity, reason and permanence will perforce take the place now held by the ornate, the queer and the ephemeral.—*The Brickbuilder.*

Written for THE CLAY-WORKER.

CHICAGO PAVEMENTS—PAST, PRESENT AND FUTURE.

THE REQUEST FOR a paper on Chicago pavements, with special reference to developing the situation as it relates to brick, has served to arouse old memories, as well as to remind me of the flight of time and the changes wrought since making my first survey of Chicago's streets, forty-five years ago this spring. Pavements there were none, not a foot in the city at that date. Pine stringers, say 4x4, were laid on the leveled sand of the lake shore or the black mucky soil of the prairie a little removed from the shore, and to these stringers pine planks were spiked, and these improvements were found only in the business center and on the main arteries of the city. Lake street was the main business street, most of the retail and many of the wholesale houses being found upon it, the balance of the business portion of the city being largely the wholesale heavy goods houses on South Water street and the cross streets between it and Randolph street.

In 1854, the year of our arrival, there were about twenty-seven miles of such plank roadways, good, bad and indifferent, which, during the spring months, might have been as fairly named pontoons as plank roadways. All else was yielding sand or black, tenacious, pasty slush, during the breaking up of winter and after every prolonged and heavy rain, there not then being a rod of public sewer in a city of 60,000 people. An early historian, commenting upon these planked roadways, is on record as saying: "With such foundations, and the churning process performed by each loaded vehicle, they (the planks) soon formed a barrier to easy and safe locomotion."



a Chicago St. near City Hall late in the 60's

We call to mind as we saw it, we think as late as 1858 or 1859, one of these plank roadways at the corner of Fifth avenue and Randolph street, only a block from the City Hall. Broken plank afloat or partly submerged, a black pool; a scantling, to which was attached a section of a dry goods box, bearing the legend, "No Bottom," warned the traveler of hidden dangers. Wooden block pavements, first known as the "Nicholson" pavement, made their appearance in 1856. In 1857 the length of two blocks was laid with stone bowlders, viz., from Randolph to Washington, on La Salle street, and from Lake to Randolph, on Franklin. Six miles of sewers were laid in 1856.

Fourteen years later, at the time of the great fire in 1871, Chicago had 91 1-2 miles of improved streets, all told, mainly of wood blocks, with a few stretches of stone bowlders in the wholesale district, and including a few miles of macadam or cinder.

But let us turn to the Chicago of to-day. At the close of 1898 street conditions have been summarized about as follows: A total length of streets amounting to about 2,600 miles, of which less than one-half have been more than turnpiked. Of the improved portion, 765 miles have been paved with wood blocks and about 355 miles macadamized; of asphalt pavement there was fifty-eight miles, of granite blocks twenty-six miles and of brick fifteen miles. It has been estimated that $33,500,000 was expended in the nine years ending January, 1899, in laying new pavements, and that the expenditure was far from being adequate to meet the necessities of the case no one familiar with Chicago streets will doubt, and it will be readily admitted by any intelligent Chicago man who has a regard for the truth that the city of which he is so justly proud is the poorest paved of any of our larger municipalities. It should be remembered, however, that the New York of Manhattan island has less than one-sixth the same mileage to care for, and with vastly superior natural foundations, and this is relatively true of most of our larger cities. The last two years the streets have been neglected as not before for many years, $916,000 being the total sum placed to the credit of the street department in 1898, while it is said that proper and needed repairs to the wood block pavements alone called for not less of an expenditure than $1,580,000, leaving a slim chance for the old-time Chicago boodler to put in his fine hand. In 1897 not over fifty miles of pavements were laid, and over one-fourth of this was the repaving of streets previously paved (with wood blocks, no doubt), while in 1898 even less paving was done, not over one-half of which was on streets previously unpaved.

Yard of Western Stone Co. Looking down Main Driveway.

This brings us to a point where we may consider the work in hand for the present year. It is stated on what we may accept as good authority, that improvements already agreed upon, to be made in 1899 call for an expenditure in gross of over $10,000,000, and this specifically for the laying of new pavements, having nothing to do with the street budget. As nearly as we can ascertain what of mileage is involved in this expenditure, and the number of miles of each kind of pavement to be laid, we include in the following statement:

Asphalt	50 miles.
Brick	42 miles.
Wood block	67 miles.
Macadam	34 miles.
Granite	10 miles.
Total	203 miles.

The computations of mileage have been made by us on the basis of a total expenditure of $10,000,000, and on a given percentage of expenditure for each variety of pavement as to the whole, also on the basis of an expenditure of a given number of thousand dollars per mile for each kind, such basis being furnished by a Chicago gentleman who is regarded as a high authority in the city. These cost-per-mile estimates do not agree with those given us by other parties in the city equally well informed, which, if accepted as a basis instead, would make considerable change in the proportion of brick to asphalt.

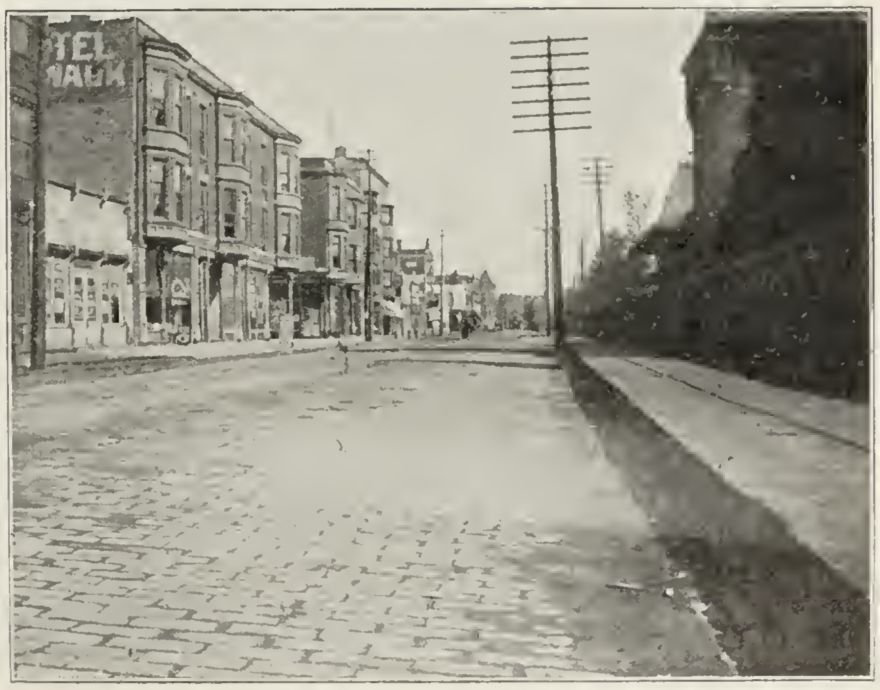
The bases upon which the computation was made are upon the average cost per mile now given, viz., $100,000 for granite blocks, $70,000 for asphalt, $60,000 for brick and $30,000 each for macadam and wood block, whereas City Engineer Wheelock and other good authorities concur in the following statement: Making the cost of brick our standard, granite blocks will cost 50 to 60 per cent. more, asphalt 33 per cent., while wood blocks and macadam will cost 50 per cent. less. Assuming these figures to be nearer correct, and starting with $30,000 per mile for wood blocks, we make our table of mileage approximately as follows:

Granite	10½ miles.
Asphalt	44 miles.
Brick	42 miles.
Wood blocks	67 miles.
Macadam	34 miles.
Total	197½ miles.

We need not stop to split hairs over this matter, but we are desirous of setting ourselves right with your Chicago readers, who might find occasion to criticise one or the other set of figures if standing alone. One thing is noticeable in either estimate, and that is that brick is found to be, for the first time, asserting its rights to consideration in so vigorous a manner that it bids fair to hold in the near future quite a different relative place from that held by it in January, 1899. Taking the last list given of mileage for 1899 and comparing with the mileage at the beginning of the year, what are the percentages of gain for the year for each class of paving? We make them up as follows:

	Jan'y, '99.	Laid in '99.	Gain, Per C't.
Granite	26 miles	10 miles	38
Asphalt	58 miles	44 miles	76
Brick	15 miles	42 miles	280
Wood blocks	765 miles	67 miles	8¾
Macadam	355 miles	34 miles	9

In the nature of things, as we shall hope to make plain later, we believe this rapid advance is to be maintained. A further view of the relative advance made by brick this year is drawn from a published statement of the various sections of street improvements to be made, each of which improvements were acted upon separately, and hence express in each separate case the preferences of the property holders in each district or section. Sixty-two street sections to be paved call for brick, forty-eight for asphalt and thirty-six for wooden blocks. As the sections of pavement to be laid involve longer or shorter stretches, this presentation of the case does not necessarily conflict with the figures given of mileage, but



Lake Avenue North of 57th St. Laid with Ottawa Block, in 1885.

they show that by far the largest number of improvements have been captured by brick.

It may be well to refer to the laws which govern the laying of new pavements in this city. The general fund raised by the city for street purposes is purely for their cleaning and maintenance. The cost of all improvements is covered by assessments against abutting properties. The methods pursued in arriving at conclusions as to what class of pavement shall be laid are as follows:

Previous to the holding of any regular meeting of the Board of Local Improvements, which meetings are presided over by the Commissioner of Public Works, information is given as to what localities will be considered in order that interested parties may be present to further what may be deemed the local interest, or to make protest, as the case may be. It is the declared policy of the Commissioner of Public Works to carry out the wishes of a majority of the property owners in any district to be paved as to the character of material employed.

It is plainly for the interests of the city that these improvements be of the higher grade—of either granite, asphalt or brick—since parties contracting to lay brick or asphalt pavements are required to guarantee and keep them in order for ten years, thus saving the city any cost for repairs during such period; while it is well known that a wood block pavement has not an average of more than seven years of life, and the statement has been made that at the beginning of the present year about six hundred miles, or 80 per cent., of these block pavements were needing repairs, and about 50 per cent., or about 175 miles, of the macadamized streets were also calling for repairs, this while brick and asphalt were making no demands upon the public treasury.

Having discussed and made plain, as we trust, the present conditions of the paving question generally, we are now ready to take up the question of

BRICK PAVEMENTS

In particular. The first piece of brick pavement laid in this city was on Lake avenue, in the Hyde Park district, extending from Fifty-first street to Fifty-seventh street. It was laid in the form of large blocks, 4x5x12, made at Ottawa, Ill. They were put upon the street in 1885. These blocks were not what they should have been. Such blocks would not be accepted by any intelligent engineer to-day, as they were unevenly burned. The tests by abrasion and absorption were unknown at that date. The general appearance as to hardness or softness, as recognized in the handling, governed, and the evidences are that no careful discrimination in this regard was exercised. A large proportion of these blocks, however, are apparently in as good condition to-day as when first laid, and the whole pavement would be in excellent condition to-day had the foundation been good. A photo engraving of that section of the pavement near the South Park Illinois Central Railway station, at Fifty-seventh street, is here given.

It is conceded by the most experienced manufacturers of paving brick in Illinois that it is not practicable to burn an extremely large sized block of Illinois shale that will hold its shape while being thoroughly vitrified, and, so far as we have ascertained, such blocks are not being produced to-day. Ohio has clays that permit and encourage such production when quality of product is only taken into consideration, but the wide-awake manufacturers of pavers everywhere are learning that it is more profitable to make for a paver a brick that, if a little "off," will command a good price and meet with a good demand for general purposes, and that such bricks have a special value for foundations because of their non-absorbent properties. At the time when this particular piece of pavement was laid clay pavers were looked upon as a sort of curiosity in this region. The people were beginning to tire very much of cedar block pavements, and anything that had promise of being better was very acceptable, and it was hoped they might prove what was needed. This street had been previously covered with gravel, and was simply graded prior to laying the blocks. The best way of laying paving blocks or brick at that time was about as much of an unknown quantity as was the best size and shape to be given them; and yet these blocks, made and laid under such circumstances, have very few of them been removed.

A careful survey of this pavement just made warrants us in saying that, were it now taken up and the street properly regraded, and the good blocks relaid, nine-tenths of them, turned over to present the other face to the wear of traffic, might be expected to do even better service in the future than in the past, as the elimination of the soft blocks would greatly improve the street as against any period in its past history. It is well to bear in mind that this pavement has already outlasted two wood block pavements, in the meantime making no such demand for repairs as would have been made by them, and now, at a very moderate cost, it may be put in condition to outlast two other block pavements, with hardly a tithe of the expense attendant upon keeping them in anything like the same general good condition. We cannot learn that any general repairs have been made to this first pavement since its being laid. Not a bad showing, as all must admit, when the state of the art at the period of its laying is taken into the account.

Having become interested in a statement made by D. V. Purington concerning the next piece of brick paving laid in Chicago, in order of date, but after an interim of six years (1891), though it was not on a public street, we were led to visit it, and now present it as an object lesson worthy the attention of any one interested in brick paving.

At the intersection of Twenty-third street and Archer avenue is to be found the yard of the Western Stone Company. This yard had been used for a great many years as a lumber yard, and its entire surface was covered with a layer of chips, bark, sawdust and all kinds of decaying vegetable matter, this being its condition at the time it was put in order for its present occupants for their business. It was simply graded to a level, excepting as to the roadway leading to the street, which required an ascent of perhaps fifteen to eighteen inches in fifty feet. When the rubbish spoken of was graded a two-course brick pavement was put down, the lower on the flat and the upper on the edge. These were the small common shale Galesburg brick, about 8x2¼x4 in size. One inch of sand was placed between the two courses and sand was used as a filler. There is probably no yard in Chicago where more or heavier material is handled in the working, on the same size or space of yard, or from which heavier loads are hauled. This paving has been now subject for eight years to this character of service, and all the material handled has finally had to pass over the roadway referred to. I am told by an officer of the company that not a faulty brick has been replaced in this yard, and not a cent spent in repairs. A very careful examination of the paving generally, and of the roadway in particular, failed to discover to me a crushed or crumbling brick. We present a photo engraving of the roadway. The up-grade haul would, of course, serve to emphasize the wear at this point from the clawing of horses' hoofs in drawing five-ton loads up it, but there is no special wear to be seen.

E. G. DURANT.

A CASE OF REAL EXPANSION.

The Ohio Ceramic Engineering Co., of Cleveland, O., has purchased from the Central Machine Co., of Cleveland, its entire brick machinery department. Among others the sword machine has passed under its control, and the company wishes to announce to the trade that it has a full line of repairs for these machines in stock, and that prompt service can be given in supplying all wants in this department. Inquiries for repairs, etc., should be addressed directly to the Ohio Ceramic Engineering Co. The purchase also includes the "J. N. K." brick machine. The company believes that this machine will supply a demand that is very large indeed, and that it will, within a comparatively short time, meet with the same success that has already been accorded to their represses and other machines.

Written for the CLAY-WORKER.

BAD ROADS VS. GOOD BRICKS.

THE SITUATION AT WOODBURY, N. J.

FROM A STANDPOINT of progression, and in the interests of the clayworker specifically and good brickmakers generally, I became interested in the discussions between the council and the citizens of the above little city.

Anything constitutes a city in New Jersey, provided it can produce evidence of having (both transient and permanent) three or four thousand inhabitants, an unlimited supply of dust and mosquitoes, and a newspaper.

In New York State it requires 15,000 good, solid, progressive citizens to create a city. But that's "away off," so we won't bring it in.

Woodbury, so the local historian tells us, was founded in 1681 by Henry Wood, since dead, but formerly of Burz, England. In 1777 Lord Cornwallis was stationed there with his troops, but became convinced that it was no place for an English lord or man, and so resolved to surrender. Since which time the residents jogged along, very few of them dying, until 1854, when, being incorporated as a city, the new-found dignity compelled many to stop the hearse in the middle of the street, and were driven off never to return.

The New Jersey State law provides $150,000 annually to be expended in part towards the making and maintenance of good roads. This the State Commissioner, in his recommendation, allows as follows: One-third to be paid by the State; two-thirds to be paid by the county, less 10 per cent. payable by property owners whose property abut on the highways.

About the middle of last month a special mass meeting of the citizens was called to take steps for the procuration of new roads, but a small $1,200 fire broke out, and the meeting was adjourned without form or dignity.

Later on the meeting was reconvened, and a free and open discussion on the merits of bricks and the demerits of macadam was had.

Here's where I became interested. One gentleman went so far as to declare that "time was not ripe for such a burden of taxes as bricks would incur. It would drive investors and manufacturers from the city for the entire life of the bonds."

He and I differed, but, as he was the bigger, I let that pass.

Lawyer H. F. Nixon declared himself in favor of a vitrified brick pavement laid in a concrete bed, though the cost would be $5,000 more. He thought (rightly) it would prove more satisfactory in the end. The difference in macadam and brick would be about $18,000, and here's where the Woodbury ship went to pieces.

Attorney Swackhamer argued most strenuously, and declared he had not seen any pavement that pleased him more than vitrified brick.

Mr. Bowlan, of Zanesville, O., made a lengthy explanation as to tunnelling for sewers without disturbing the streets, and, although he thought $30,000 too high, he believed a contractor would do the job for $25,000, and guarantee the work for three or ten years.

Colonel Green, a resident and a manufacturer of patent medicine, known through every State in the Union, in a special telegram, urged the adoption of a brick pavement.

Copies of THE CLAY-WORKER, illustrating splendidly the pavement and condition of the streets in Indianapolis; Dayton, O.; Kokomo, Ind., New York State and other places were shown to and by genial William M. Carter, the surveyor and engineer of the city of Woodbury.

But the same cling to your dollar and dust principles which dominated these folks when Lord Cornwallis wanted new shoes for his regiments, and they (the citizens) replied "they'll do for the present," caused them in this momentous time to declare for their principle thoroughfare—Broad street, 4,200 feet long—a macadam road, because it is cheap.

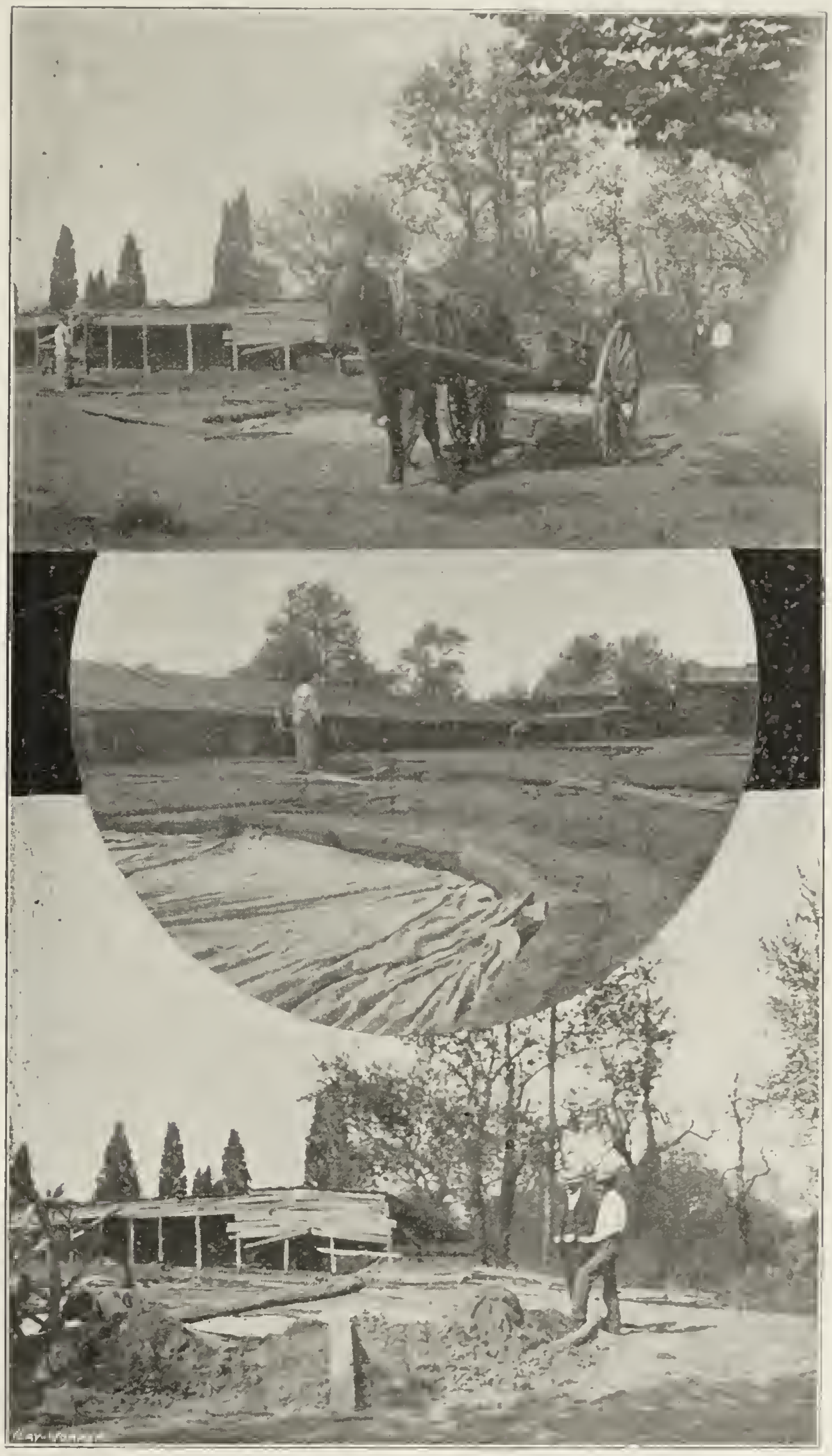
The road runs from twenty to thirty feet wide, of which the trolley-car line maintains seventeen feet. The final estimate has been made and accepted, with the provision that for the sum of $6,500 the road shall be macadamized to within a four-foot line of the gutters, and in this the award has been made to the Clearfield, Pa., vitrified paving brick people for $2.12 per square yard.

Traffic and dust alike are heavy. Truck and farmers' wagons will give these good city fathers all the trouble and dirt they may desire, with a good possibility of their declaring next time most emphatically for a good, substantial brick road.

AN OLD-TIME BRICKYARD.

Woodbury maintains a piano factory, a glass factory, a medicine laboratory, a small brick plant, and a large amount of suburban dignity.

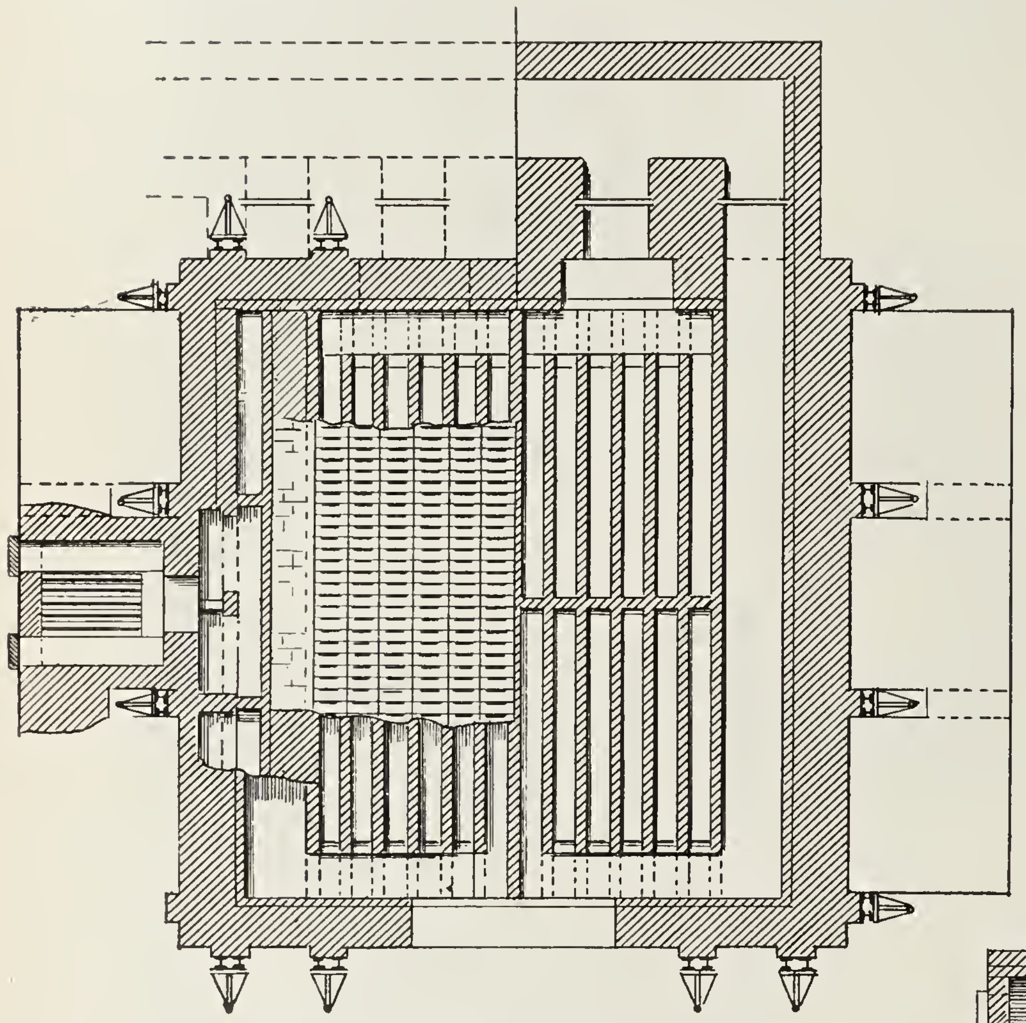
After wending my way through five inches of dust and a narrow Indian trail I found myself looking at a primitive layout that has been associated with this place for over forty years, in the possession of Charles Thackara, son of the late Benjamin Thackara, a veteran brickmaker before him. Covering some seven or eight acres, the layout consisted of two tempering pits, the run of hacking sheds, a six-arch up-draft kiln, a capital drying yard and two hand gangs.



Glimpses of Thackara's Brickyard. The tempering pit in the Center covered with Canvas to keep Clay Moist.

Meeting Mr. Thackara in the shelter of his home adjoining the yard, I learned that Woodbury tried at one time to support two brickyards. Woodbury didn't fail, but the other yard did, and, to quote Mr. Thackara, who makes common hard stretcher, pressed brick and tile, "we can do all Woodbury wants. I get up in the morning at 3 o'clock and work until noon, when my men go home. I have and can make sixty-two bricks in four minutes. We burn timber here; it is cheap—about $2.50 a cord—and that pond out there is mighty useful; that's where we keep our rustling poles. Our clay is good on top, but a trifle lumpy underneath, as you see by our last burning." These proved to be good in color, almost blood red, but, owing to the poor effort made by the time-worn pugging machine, the hard shale had not been reduced, consequently these projections, standing out like lumps of bacon fat, chipped off like old cheese.

Sincere, and even with a tentative standoffishness, he admitted having seen THE CLAY-WORKER sometimes, but, with a degree of half-hidden contempt, he declared he wasn't interested in machinery, and you had but to view his simple press machine, harnessed up to one end of the shed, to believe it.



Asking him if he maintained a scale of prices, he informed me that he was getting $5.50 for salmon, $7.50 for hard, $9.50 for stretcher, $15 for pressed.

Our season lasts from about April to October, and during that time we have made as high as 700,000. Plenty of room for working, and a good place for thinking.

Here was a good, honest individual, within eight or nine miles of a big city, a victim of his own local environment, content to do as much as his father did, not willing, perhaps, to do more.

On my road back to the cars I fell in with an ex-resident of Woodbury, but a fine specimen of the G. A. R., who had spent twenty years in St. Louis.

Acquiescing to the question as to whether I had seen that brickyard, he proceeded to tell me in quite a satirical way that he had once spent a whole hour there. "Why, that man makes bricks as they did in the days of Abraham, and, when I told him I had seen them make bricks by machinery, he began an argument that threatened to throw me off my feet. I tried to convince him, but it was useless. He gave way in a deferential sort of way, as though he pitied me, but when in pursuit of the subject I warmed up and told him I had seen the machines in St. Louis turning out over 60,000 a day, this was too much for him, and he scanned me very closely to find out whether I was crazy or a liar. He lives quietly and temperately, I suppose. Keeps three men going, and pays them out of the $2.50 or $3 he makes every day.

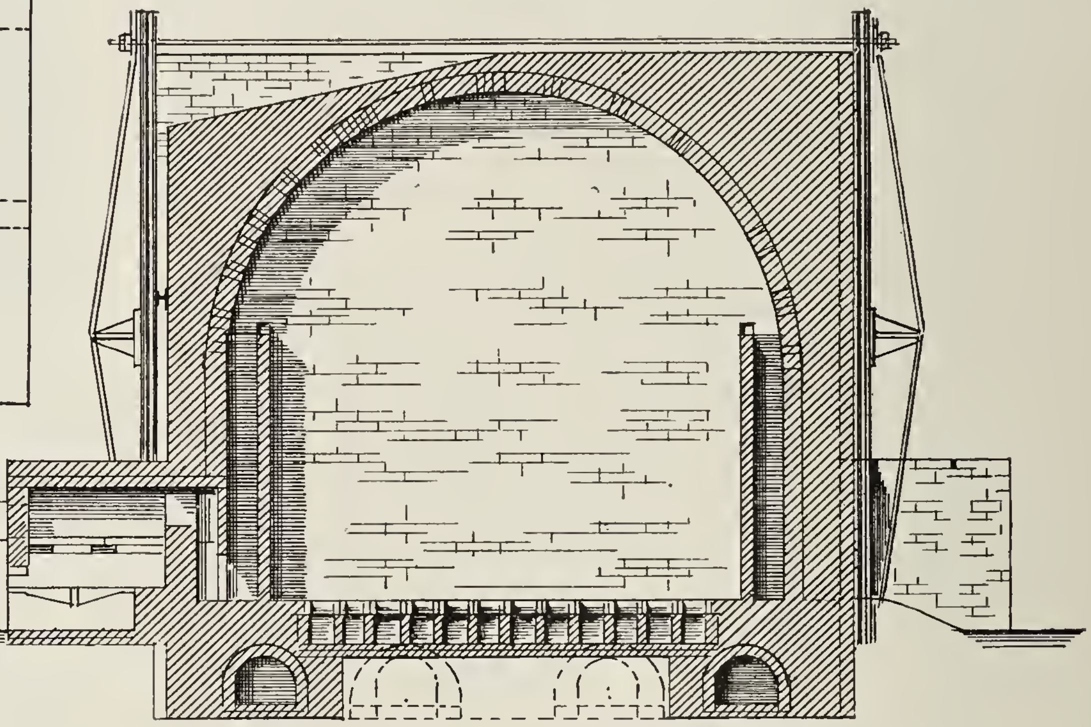
"Well, sir, he reminds me of an old fellow I saw out in Missouri. He was squattting on the roadside and I saluted him with a 'Well, neighbor, how are you?' He replied: ''Bout as userual; both ther ole woman and me has the ague and shakes.' 'Is it very bad around here?' I asked. 'Waal, stranger, it's purty bad this side of the road, though I do hear ther aint none of it on the other side.' 'Well, why the devil don't you move, then?' ''Cause I jest aint got the energy, neighbur; that's the plain gospel truth.'"

MITSCHKA.

THE GRATH IMPROVED DOWN-DRAFT KILN, WITH COKING FURNACE ATTACHED.

We are pleased to exhibit cuts of this celebrated kiln which, it is claimed, is pronounced by all who have seen the results of the same to be the best kiln in the market. Wonderful results are obtained in this kiln. In burning red face brick over 90 per cent. are of the highest grade that can be turned out, the balance being second quality and sidewalk paving brick. In burning color brick, such as white, buff and gray, over 99 per cent. are first-quality brick. These results are obtained at the works of the American Hydraulic Press Brick Co., at Collinsville, Ill., every day, and also at the Green & Hunter brick works at Thurber, Tex. The kilns are also in use and are giv· the highest satisfaction at the works of the Thomas Press Brick Co., Thomas Landing, Ill.

The above cuts show the Grath gas and coking furnace attached, which is one of the most important inventions in brick burning, as with this attachment the brick are burnt by the use of slack coal in the place of lump coal with even better results, as there are absolutely no flash brick in the whole kiln.



Parties desiring further information can get the same by applying to the Illinois Supply and Construction Co., St. Louis, Mo.

ON SELECTING NAMES.

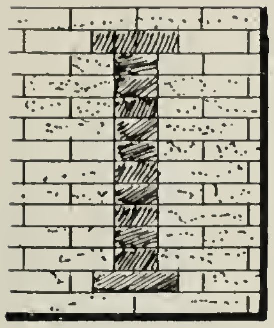
A taking name is much to be desired for the purpose of designating either a business corporation or wares. A short name—one that will express what is wanted, and one that comes easily to the tongue—is always to be preferred. A long name, or combination of names, particularly if they are polysyllabic words, are not only a nuisance in talking, but become doubly so in writing. Names which require the full length of an envelope in addressing, or which take up all the space in writing a check, are responsible for a lot of words that would not look well in print.—Crockery and Glass Journal.

It is to live twice when we can enjoy the recollections of our former life.—Martial.

Written for The Clay-Worker.

MODERN AMERICAN FRONT BRICK. No. 16.

CHEMICAL TESTING.



IN THE LAST PAPER we discussed some of the points in regard to which chemical analysis gives us valuable information, and we finally considered the importance of the rational method of analysis in respect to the chemical and the physical constitution of clays. It remains now to cite an example showing the practical application of the method. We cannot do better than to turn to Dr. Seger's invaluable records to find excellent proof of its value. In one case the problem to be met was the reproduction of French and Belgian white ware bodies by means of German raw materials. Of course, the first thing to be done was to make rational analyses of the foreign bodies; that is, to determine the percentage of quartz, feldspar and clay substance. The next move was to make use of well-known German raw materials, kaolin, plastic clay, quartz and feldspar, and to build up a body similar in chemical composition and physical properties to the ones to be reproduced. It was not sufficient to have the same chemical composition, since the questions of color and plasticity were of equal importance. The bodies were required to have sufficient plasticity and bonding power to be worked on the wheel and yet not show excessive shrinkage. At the same time the color had to be as white as possible, and hence the addition of plastic clay, which, as a rule, has a tendency to burn buff, had to be kept down to the minimum. To start with, the contents of quartz and feldspar are fixed quantities, which could be directly used as a basis for the new composition. For instance, when the analysis showed a contents of 24.5 per cent. of quartz and 7.6 per cent. of feldspar, these amounts were directly replaced by German quartz and feldspar. The balance was clay substance, which had to be brought in by kaolin and plastic clay, a kind of ball clay. Since both of the latter for the greatest part represented clay substance, it was not possible to calculate their respective percentages from analysis, but a few empirical trials were required in order to determine the proper proportion for the best color and best working quality. But the whole thing was simplified to an enormous extent since, in place of three unknown quantities, there was left to determine only part of one, which is a simple matter. Of course, when either the ball clay or kaolin carried some quartz or feldspar, allowance had to be made for these amounts in adding the total amounts of spar and quartz to be used. Did Seger actually succeed in thus reproducing clay bodies? The work done by him along this line has been of great value to the German industries, and through his efforts it became possible to entirely control the body compositions. One need only follow up his researches in regard to Japanese porcelain, in which he actually succeeded in reproducing the Oriental ware from the basis of the rational analysis.

Now as to the calculation, used in the synthesis of a body, it is a very simple one, consisting of the plain proportion or rule of three, and is best explained by an example. Suppose we had to make a body which, by analysis, has the following composition:

Clay substance, 60 per cent.; quartz, 25 per cent.; feldspar, 10 per cent.; carbonate of lime, 5 per cent.

We find available a kaolin of the composition:

Clay substance, 70 per cent.; quartz, 30 per cent; a plastic clay, consisting of clay substance, 85 per cent.; quartz, 15 per cent.; and feldspar and chalk (carbonate of lime) of the commercial type.

Now it is desired to introduce two-thirds of the clay substance by means of the plastic clay and one-third by means of kaolin. The calculation for the plastic clay will be as follows:

85:40 = 100; x = 47.07 parts of plastic clay which brings along 40 parts of clay substance and 7.07 parts of quartz sand. The kaolin we calculate as follows:

70:20 = 100; x = 28.57 parts of Kaolin which introduce 20 parts of clay substance and 8.57 parts of quartz. Since the plastic clay and kaolin have carried in together 15.64 parts of quartz we need add only 25 — 15.64 = 9.36 parts of quartz sand. On the other hand no feldspar and carbonate of lime has been brought in so that we must add the full amounts, 10 and 5 respectively. By adding up the amounts of clay substance, quartz, feldspar and lime we find that we have made up a body corresponding to the required composition by using 47 parts of the plastic clay, 28.6 parts of kaolin, 9.4 of quartz, 10 of feldspar and 5 of carbonate of lime. Of course the ratio between the plastic clay and kaolin may be varied at will, for instance in place of two-thirds plastic clay and one-third kaolin we may reverse the proportion or put it into any other ratio to suit the practical requirements of the case.

But the question will be asked: What bearing has this sort of thing upon anything related to front brick? In answer to this let it be said that many phenomena puzzling us in our daily experience might be cleared up by just such a knowledge of the mineral composition of a clay. Permit me to cite an instance. One of the veins of a clay used for making flashed brick invariably gave rise to cracked ware. Analysis showed that the material was high in extremely fine sand, and it needed but little reflection to show that this sand had so reduced the strength of the clay that it could not withstand the strain exerted at the surfaces during the flashing period. Yet, on ordinary examination, the silt-like silica could not be detected, especially since the clay was of a hard nature. And again it seems that the time is not far distant when front brick manufacturers will turn their attention also to the allied branches of the business—the manufacture of floor tiles, roofing tiles, etc.—in which a knowledge of the subject under discussion is, to say the least, very valuable. The rational method is to be applied not only in reproducing bodies but also in controlling the raw materials of a standard body and correcting any faults which may occur through changes in the character of the materials. Having by trials once established a satisfactory body corresponding to so many per cent. of clay substance, quartz, feldspar and carbonate of lime, it is the business of the clayworker to keep as close as possible to this composition, for which purpose the method as above indicated will afford a safe guide.

Quite important, though not so much so as in the case of synthetical body composition, the rational analysis is in regard to the determination of refractoriness of fire clays. This it is not necessary to explain in detail, since it is evident that not only the chemical composition of a fire clay governs its heat-resisting power but also the physical structure. A clay showing by ordinary chemical analysis a higher contents of silica than the assumed standard composition of clay substance may carry might have this excess due to quartz or feldspar, and it is important to know which it is. It is known to us that feldspar acts as a flux, promotes vitrifaction at a very much lower temperature than that at which silica is said to possess fluxing qualities, and again that a contents of quartz together with spar accelerates vitrifaction to a considerable extent, since the grains of the former are dissolved by the fusing feldspar. The clay substance is the great factor of refractoriness, but the other ingredients must not be neglected. We may say that the heat-resisting power of a clay is directly proportional to its contents of clay substance, modified by the presence of quartz and feldspar and the size of their respective grains. Thus the only true way of considering the refractoriness is in the light of the mineral composition, since it also gives us data upon which to base other desired properties, such as resistance to abrasion. More than once it has been tried by scientific men to combine the figures of the chemical analysis, without reference to the mineral composition, in mathematical formulae which were to express the numerical refractory power. But they have failed in their purpose, as we should expect, since clays are not homogeneous silicates like glass. The best known of these expressions is that of Bischof, stating that the refractoriness of a clay is directly proportional to the square of the alumina contents, and inversely as the silica and the fluxes. It appears that in order to obtain an idea as to the comparative value of the heat-resisting power of a clay its separation into the mineral constituents is, up to the present, the only promising test, and it seems that by collecting the analyses expressing these simple relations, and the data of their respective fusibility, more definite conclusions should be arrived at. This is one of the things which need doing along the line of ceramic research. What has been said of the refractory power of clays refers, of course, only to fire-clay goods, since for front brick, etc., the matter of heat resistance is of more indirect importance. But to show to what extremes theoretical conclusions primarily intended for the consideration of highly refractory materials have been carried, the writer has seen the statement made by a recent writer that clays can be calculated into mixtures of all descriptions by a system of calculation based on purely chemical data.

But let it not be understood that the ordinary chemical analysis is devoid of practical value. To the man who has made a study of clays it tells a good deal, after all; to the inexperienced man it means but little. By comparing analyses of clays for the manufacture of salt-glazed goods, the contents of silica will invariably be found high, as the requisite of salt glazing is a sufficient amount of free silica to combine with the soda of the salt. Hence, a clay low in silica would be shown to be unfit for this purpose by the data of the analysis. Again, for making a dense, vitrified body, with a good margin of safety in burning, a clay with a very low percentage of potash and soda would be declared unsuitable

Let us now summarize briefly the information obtained from the analysis of clays. First, we are told the percentage of the mineral constituents, clay substance, quartz and feldspar; second, the secondary ingredients, carbonate of lime, sulphate of lime, carbonate of iron, iron pyrites and carbon, and, third, the soluble salts. From this array of data we know to take a clay as a whole, for what purpose it is best suited, whether it is hard to burn, and what peculiarities we may expect to find in burning, the changes in color liable to be produced, whether the process of vitrifaction is a slow or rapid one, whether the clay will stand quick firing, and, finally to what degree it is subject to discoloration.

But at the same time it is not a safe procedure to stake everything upon chemical analysis. In every case its information must be checked by actual trial and physical tests.

AMERICUS.

BURNING OF BRICK AND TILE AND THE CONSUMPTION OF FUEL.

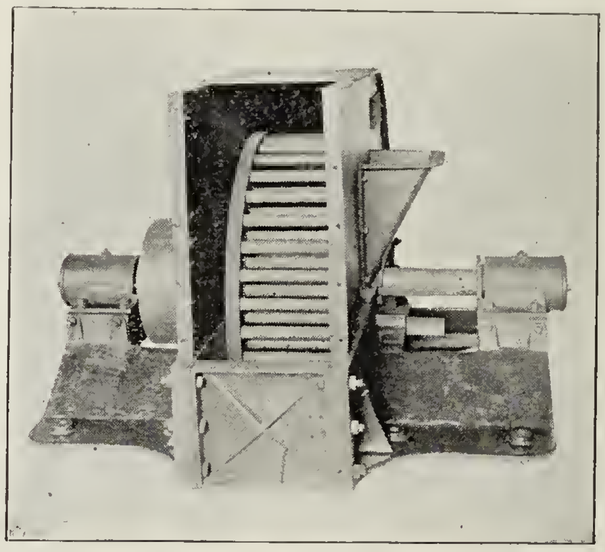
The burning of brick is the most essential and particular part in their manufacture, and, at the same time, is one of the most expensive, when not conducted on scientific and practical principles. In order to obtain a No. 1 kiln of brick or tile you must first have a well-contsructed and proportioned kiln; second, you must have your brick or tile properly set and laid, but not of the least importance by any means, but, on the other hand, the most important, you must have a suitable furnace for supplying the heat regularly and excluding all cold air, and also one which has suitable means provided for good combustion. All practical brick and tile men know the outcome, both in results and the consumption of fuel, when they neglect to observe any of the above requirements. What is the result when your fire box is so constructed as to allow more or less cold air to come in contact with your ware? If your clay is of a very refractory or tender nature you will have a large per cent. of checked brick or tile, and this is not the only bad effect which cold air has. It increases the consumption of your coal pile enormously. Every practical brick burner knows only too well how long it takes him and how many extra bushels of coal it requires to regain a uniform settling heat in the kiln which when once obtained is allowed to become chilled.

In recent years the competition in the brick and tile trade has become so great that most every manufacturer has been or is trying to economize on every point. As the fuel is one of the principal costs in the production there has been a marked tendency with most all enterprising and practical brick and tile men to devise some improved and economical method of burning their product. The writer of this article has also been in the race, trying to develop a more economical and satisfactory method of applying heat to brick and tile, and has been rewarded with what has actually and practically demonstrated itself to be the most economical and effective furnace to operate and construct on the market. See cut on page 461 of this number of the CLAY-WORKER.

A PRACTICAL BURNER.

A DUST-PROOF PULVERIZER.

Those who manufacture brick by the dry clay or semi-dry clay process do not need to be told that the dust-laden atmosphere of the clay preparing room is very trying on all machinery, and particularly pulverizers, which of necessity are run at a very high rate of speed. With a view of overcoming this difficulty the Fernholtz Brick Machinery Co., of St. Louis, have constructed a dust-proof pulverizer, of which a miniature illustration is here given. They claim that this machine is so constructed that it has much better wearing qualities than ordinary machines of this type. They will be pleased to explain further to anyone who is interested sufficiently to write them. They will also be pleased to tell any of our readers about the Fernholtz brick press, which is shown on page 413, and their improved adjustable mold box, which can be adjusted to any ordinary dry-press machine.



THE BOOK THAT HELPS ME MOST.

It was not Shakespeare's matchless mind
  That gave me what I chiefly prize;
Nor yet in Bacon did I find
  What best rewards my studious eyes.

Johnson and Swift, and Sterne and Pope,
  In turn exhort, instruct and please;
Yet, when with crucial risks I cope.
  Assistance comes from none of these.

For, though among the learned host,
  Book after book I taste and test,
Of those that truly help me most,
  My father's checkbook is the best.

—A. N. L., in Truth.

For bargains in machinery, experienced workmen, desirable situations, etc., look through the "Wanted, For Sale," etc., columns of this issue.

Written for the CLAY-WORKER.

CLAY PRODUCTS IN THE NATIONAL MUSEUM.*

BY EDWARD A. OLDHAM.

IT IS NEEDLESS to go into ancient history regarding bricks, since every reader of the Bible will remember that the Egyptians and Babylonians were the first makers of that article. The book of Exodus tells the story of how the Jews, who were slaves in bondage, had been forced to make the building materials of sand and clay, mixed with straw, drying them in the sun, and erecting with them the great granaries of Rameses and Pithou. Greek and Roman history are likewise replete with data relating to brick. Germany, France, Spain and England and other countries during more recent times have given their quota to that industry. All of these and other nations and peoples not mentioned herein, have made bricks chiefly by hand labor, and this method is largely in vogue in such lands even now, owing, doubtless, to the fact that labor is cheap and the demand not extensive.

As an American industry, brickmaking has advanced with great strides, notably from the construction of machinery, which has enlisted the inventor's skill and absorbed a vast amount of capital, and is yielding in turn a golden harvest. The number of great "sky-scraping" buildings, some of which rise to a height of twenty-four stories, all have a large amount of brick used in their construction, and to make them fireproof, bath floors, inner walls and ceilings are provided with brick and tiling; in fact, modern architecture has almost, if not literally, abrogated the use of wood, except for trimmings, doors, windows or fixed furniture, so that the building, however high or pretentious, stands complete in a steel or wrought iron frame, filled in with bricks and tiles from basement to roof.

Indeed, the making of artistic designs for embellishing the facades has so far progressed that the building stones of concrete or artificial material have lost their use and application, since with the introduction of improved machinery these ornamental detail pieces are furnished at a more nominal price, in less time, and of a greater durableness. Most hewn stone will not stand climatic effects, but the evidence in favor of burned brick shows that they are almost indestructible, and that they have withstood the ravages of time for thousands of years, on account of the nature of their composition and treatment, being subject to vitrification and drying in kilns, rendering them completely anhydrous, and therefore impervious to telluric effects.

Thus, as an economic industry, the making of bricks has become an important factor in American productions, and in nearly all States of the Union where clays predominate, brick kilns are erected.

Nor is the building brick alone in the field. Industrial chemistry has been a great aid in giving advice and instruction relating to methods of testing clay, treating it with other mineral, metallic and earthy elements, after the mass has been reduced to a workable condition, while inventive genius has furnished the machinery which takes the material after it has been otherwise treated and molds it into the different shapes it is to assume, the whole finally emerging from the ovens and being stacked ready for shipment.

It is roundly estimated that during the year 1897 not less than 40,000,000,000 bricks were manufactured throughout the United States. This could not, of course, have been accomplished by hand labor. Machinery that is almost automatic in its workings and seemingly human (or more than human) in its remarkable precision and accuracy, facilitated this enormous output.

Of course, in remote localities, and in most frontier territories, where the primitive forests are yet undisturbed, the buildings and habitations are necessarily constructed of wood. This was true of the early pioneers who came from Europe to the American continent, when log houses were the usual dwellings, public edifices and mansions, if the latter could be so styled.

A familiar example of early brick construction is the great wall of China, which originally completely surrounded the Empire, a length of 12,000 miles, requiring ten years for its construction, hardly more, however, than the average government building in the United States. It also required the labors of over a million of men. The top of this wall, as is well known, is broad enough to admit of a cavalry troop riding six or eight abreast, the base being considerably wider. It was constructed about 1400 B. C. as a defense against the Tartars.

The earliest date regarding the erection in America of brick structures show that they were put up in the State of New York, and that the bricks were brought from Amsterdam.

The scientific aspect of brickmaking has of late years been very greatly developed, not only for use as a building material, but in several other directions, namely, tilings, ornaments, embellishments, columns, caps, ashlars, and sculptures for facades, roofing materials, sewer pipes, gas and aqueous ducts, but by far of greater moment in the production of fire bricks for the cupolas and furnaces of the smelters employed in the reduction of iron, copper, gold, silver, lead, tin, and in the glass furnaces and crucibles, and in general for melting metals.

Among the more recent scientific applications of the brick to construction is to make it hollow. This is of special utility in the construction of tall buildings, as it removes a part of the weight without detracting from the stability. Extensive plants are now in full blast in all large clay-bearing districts, and one maker of this material asserts that hollow fireproofing, hollow building blocks and hollow material generally are with us to stay, and that the making of terra cotta is yet in its infancy. Enameled and glazed bricks have become quite an article of commerce in this country, the demand in Western States being quite extensive, while in the Eastern States it is slowly taking hold.

It is well known that ponderous masses of clay shaped for building purposes are now manufactured and burned like ordinary brick, although they may weigh as much as two tons. This could only be accomplished by a powerful down draft through the kiln from top to bottom, as well as the almost total elimination of water.

The American producers of finishing bricks have greatly advanced in the art of coloring them, notably in tile fabrics. Chemistry has assisted quite a little in the furthering of this class of products. In this department a large field is yet open for development, but the American artisan is equal to the task, if one will observe the artistic designs as now introduced into the new structures in course of erection and already completed.

Ohio, Pennsylvania and Illinois are not to be eclipsed by any State for their vast deposits of clay and extensive kilns, while in common and pressed brick New York stands at the head. Its clay deposits are of three different kinds—refractory, plastic and shale. Their various mineral constituents are as follows:

	Canandaigua.	Newfield.	Glenn's Falls (Blue Clay.)
Silica	46.55	51.30	48.35
Alumina	12.66	12.21	11.38
Iron oxide	4.92	3.82	4.02
Lime	14.02	11.63	15.38
Magnesia	4.47	4.73	3.17
Alkalies	2.05	4.33	6.05
Water	.90	.....	.....

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As interesting and important an industry as brickmaking is shown to be by the foregoing statements, it will be a matter of surprise for those who are identified with this craft to learn that in the great National Museum at Washington there is not to be seen a single brick, a single piece of brickmaking machinery, or anything to illustrate or preserve tangible evidences of this tremendous industry that employs so great an army of workers and gives play to so vast a volume of capital. Not even an historic brick from Independence Hall, or from the old colonial chimneys of Mount Vernon, or any of the other historical spots made dear to every patriotic American, is to be found in this treasure house at Washington.

Quite a large number of bricks, some of which were decorated with picturesque designs, made by the Maw Company, of London, were exhibited at Philadelphia in 1876, and subsequently presented to the National Museum, where they were set aside recently for want of space.

The American brick, tile and clay manufacturers of the United States, who are quite enterprising in all practical spheres pertaining to this all-important branch of industry, have until now been exceedingly derelict in making their exhibits of articles, either for building purposes or decorations. There is no reason why they should neglect to exhibit their new and improved materials. The museum does not possess a single finished face brick, nor a terra cotta embellishment, nor any of the hollow burned clay bricks, of which so many forms are now being brought out for various uses in the sky scrapers now going up in every metropolis.

It is, however, true that the museum is hardly large enough to house such an exhibit, and the directors assert that they have on hand enough material to fill another building of the size of the present one. And yet considerable space is set aside for the cognate department of the Pueblo pottery ware in New Mexico, Arizona and Wyoming, besides the Aleutian, Alaskan and British-American Indian pot wares.

We believe that so vast and important American industry should have a complete exhibit in the National Museum to show the progress and advancement in that sphere in which millions of dollars are invested. And as there is not a single machine for brickmaking in that building, such would be as interesting as instructive to all American citizens.

NOTES FROM TIDE WATER, VA.

This section of Virginia has the brickmaking fever. We have three new yards since the first of January, and several others to follow soon. The last to start was a hand yard, run by S. T. Davis, colored. He is making 4,000 per day by hand, running one table. T. M. Lilleston started his new plant up last week, and has everything working very nicely now. He has Chambers' Bros. outfit. L. H. Clark arrived home this week from Ohio, bringing with him a carload of horses and furniture. He has been in Ohio for thirty days buying machinery and testing his clay. He bought a complete outfit from the American Clayworking Machinery Co.

The writer, H. L. Jacobs, is organizing a company to manufacture brick and tile at Suffolk, and expects to begin work on the new plant soon. Would like to hear from machinery and dryer companies.

Mr. E. B. Freeman, office Citizens' Bank Building, Norfolk, Va., wishes to engage a practical brickmaker to make brick at Georgetown, S. C. They want a million brick right away to build mills and houses.

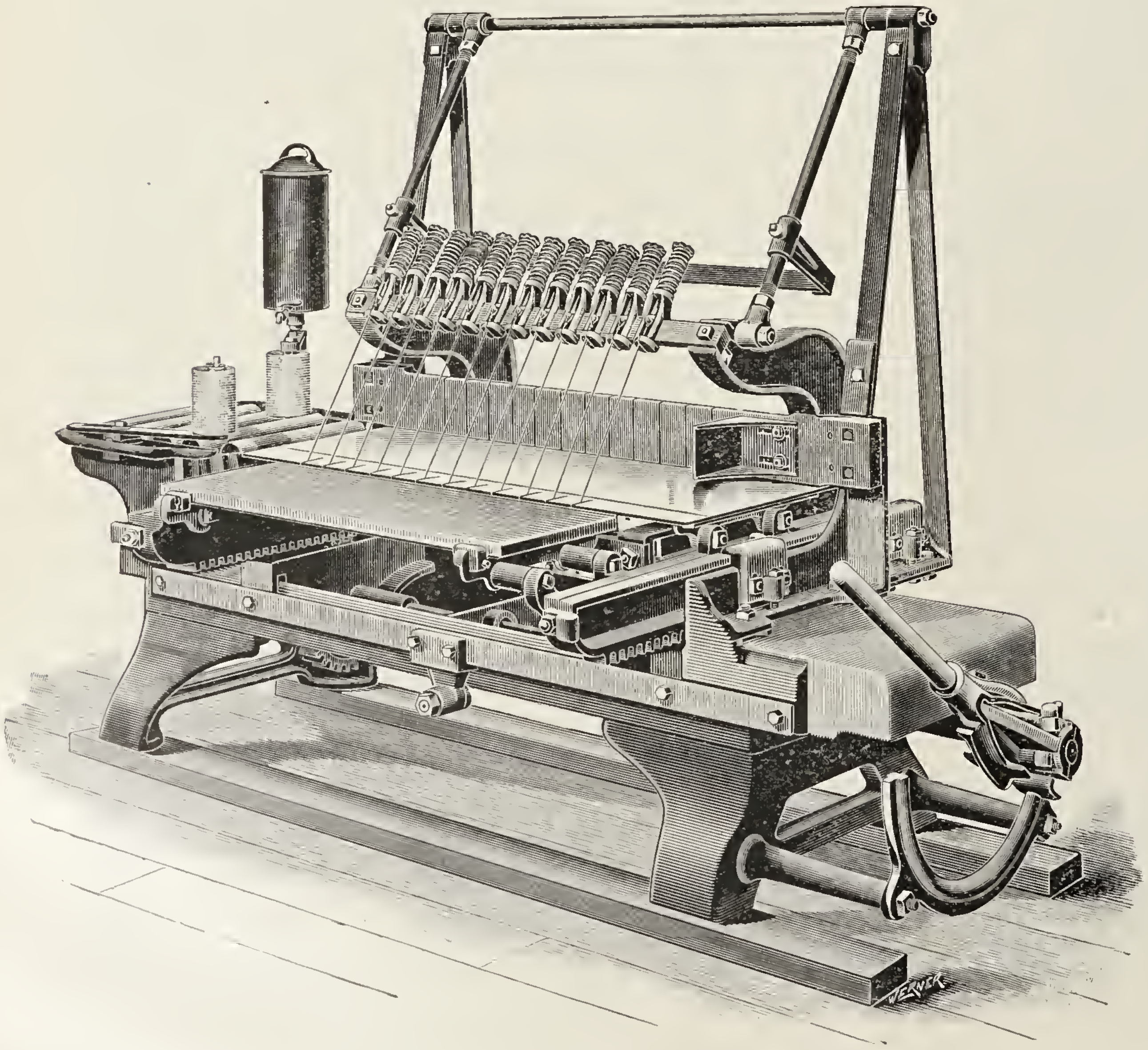
D. C. Harrell & Co. have orders booked for half a million brick, and are burning their first kiln of this season now.

This promises to be a very busy season for the brickmaker. Buildings are going up everywhere, and brick are in demand. We only hope it will keep up. H. L. Jacobs.

Suffolk, Va.

ANOTHER IMPROVEMENT IN BRICK CUTTERS.

THE IMPROVED apparatus, which we illustrate, is designed to overcome the general and very annoying defect found in other cutters from the tendency to rag or roughen the upper edges of the brick as the wires pass through the bar of clay. In this cutter the wires have a shearing or downward movement as they pass through the clay, the effect of which is to produce brick with smooth, clean-cut edges.



A New Cutting Table Manufactured by E. M. Freese & Co., Galion, Ohio.

The apparatus is operated by one lever, which is so constructed as to operate as a lever both in cutting off the brick and also in returning the apparatus to its starting point after the cut has been completed. The movement of the lever which cuts the bar of clay into brick also delivers them upon boards or pallets ready for convenient removal without the danger of being defaced by handling. The brick are cut square across, of uniform thickness and without waste.

The construction of the apparatus is such that it is not subject to great wear. The movement in the parts which produce the draw cut is slight, and anti-friction or carrier rollers are used to support the other moving parts, thus insuring easy operation, and, by reducing friction, wear is also avoided.

The bottom plate upon which the bar of clay slides is of polished steel, and the back or thrust bar into which the cutting wires pass after completing the cut is of iron, planed true and polished, with slots for wires accurately milled. Lubricating rollers are used both for the bottom and edge of the bar of clay, so that it slides freely without tendency to adhere.

The apparatus can be easily adjusted to cut either common or Roman brick. It can be furnished to cut the brick of any thickness desired, and to deliver them either on the side shown by the engraving or the opposite.

The length of the apparatus is about 8½ feet and its weight about 1,700 pounds.

For further particulars we would refer to the manufacturers, E. M. Freese & Co., Galion, O., who manufacture a full line of brick and tile machinery, as the reader may see by turning to pages 488 and 499 of this issue.

Written for the CLAY-WORKER.

FROM WAY DOWN IN MAINE.

PROSPERITY, with a big P, is with the Maine brickmakers. It is hustle from now until the first of October with them all, in order to come anywhere near keeping up with the demand. The season opened up in Bangor on the 22d of April, nearly a month earlier than usual. Hugh O'Brien's Brewer yards struck the first brick that day, and his two Martin machines have been busy nearly every day since, except Sundays. The other yards are now in full swing, every one of them fully manned, and the season's output will, without doubt, be treble the output of last year. There is need of haste in starting the yards. The brickmakers could not see last year that this year was to bring an unprecedented demand for brick, though your humble servant, who "did" Maine on a bicycle last year, after having done Massachusetts, saw it and kept telling them so through The Clay-Worker. They were scoffers then, but have remained to pray, and are kicking themselves, metaphorically, for having run half crews last year.

There is no individual animal in God Almighty's aggregation of creatures so dense as a mudyard brick manufacturer in a back town, after four or five years of depression. Prosperity must kick the wind out of him before he will recognize it as anything other than adversity. When The Clay-Worker told the Maine brickmakers last year that there was to be a million-dollar pulp plant erected in the wilds of Aroostook, on the Bangor & Aroostook railroad, this spring, the brickmaker laughed and winked knowingly, one to the other saying, "Sounds great, but you can't fool me, Charley," and now the million-dollar pulp plant is about to become a reality to the extent of more than four million outlay in the Millinoket wilds, and to find brick to keep its masons going until July will test the entire brick market of the State. Had the Bangor and Brewer and Penobscot river brickmakers read The Clay-Worker, and thought a little, they could have been pocketing two or three dollars a thousand profit now on some millions of brick that they might have made last year and didn't.

The Millinoket pulp enterprise is not the only thing that prosperity takes to spread itself in Maine this year. The pulp and paper plant at Orono and Old Town, at Waterville and Gardiner and Rumford Falls are to be added to and enlarged, but the Millinoket concern will probably be the greatest of its kind. It is located in a wilderness, unbroken, more heavily wooded and greater in area than the famous Black Forest of Germany and has as its feeder the greatest chain of lakes and streams in New England, whereby the lumber is sluiced into the mill at one end to roll out of the other end of the mill in rolls of paper and loaded upon the cars for market. The place is about three hundred miles north of Boston, and hitherto numbered among its inhabitants not more than a dozen souls. A large town is already forming there.

The man who left the city of Bangor last month to remain away until December next will have hard work recognizing the place when he returns, for big brick structures will be erected in nearly every street in which he finds himself. And it is the same story in nearly every Maine city and town; yet the plans were known last year, but the brickmakers would see it not. Even last week, down in Orland, once famous for its enterprising and snappy brickmakers, Julius Wolff, head of the International Sardine Trust, bought good brick for $4.50 per thousand for his Eastport factories, and the brick manufacturer who sold them is a deacon of the church, chairman of the school board and head selectman, and only two months ago I showed him the way to a stock broker's office, where he might invest some few loose thousands that he had stuffed into an old stocking during last season's dull sales. I do not know what to think of a man like that. He must have known that the brick would bring near unto $8 per thousand or more in May if he held on. He reads the newspapers and he has money to invest. I'm inclined to think that he would like to figure as a philanthropist. But, if so, he aims his philanthropy in a queer direction, bestowing it upon a millionaire Sardine Trust. But see how this one man's blindness to his chances did work! There was to be a brick plant put in operation in Eastport. There was money behind it and a good market before it, and that market is there yet. Julius Wolff wanted brick in a rush, and went down to Orland, willing and ready to pay six or seven dollars a thousand for brick. He bought them, instead, for $4.50 per thousand at Orland, costing him $5.75, landed in Eastport, and when they did land the Eastport brick plant fell into a faint and passed away. And three weeks from now Orland bricklayers will pay $7 a thousand by wholesale for the brick they want to lay in Orland, and Eastport will pay $9 a thousand for every brick she will want to use from now until October, and she will want to use a great many more brick than she can get at that price. Oh, the blindness of the brickmaker! It was ever thus.

Aaron H. Gould, the last of the pioneer brickmakers of Brewer, died last month of pneumonia, aged sixty-eight years. He was taken sick while overseeing the work of his wood choppers. He was a keen business man, one of the finest brickmakers that ever trod sand, and a progressive manager. His plant has been purchased by Samuel A. Holyoke, who will manufacture about 1,500,000 there this year. A large force is already at work there. Mr. Holyoke will manufacture nearly 1,500,000 in his other yard in Brewer.

A. A. Kenney, of Brewer, has orders for sixteen Hobbs brick machines (mud), for delivery in various parts of Maine, from Ellsworth east to Waterville west and Ashland north. Hosea Phillips, of Ellsworth, will run two brickyards and manufacture about 2,400,000 for Ellsworth and Bar Harbor trade. Orders have been received by him already for half that amount. The brickyard at Sherman Station, Braggville, on the B. & A. Railroad, thirty miles from Millinoket, which I built for M. & J. D. Leen, of the Windsor Hotel, four years ago, will be started at once with as large a crew as can be worked to advantage, with a view to help in supplying the demand for brick at Millinoket.

Good brickmakers are scarce and growing scarcer each year. There is a superabundance of men. Wages on mud yards here are about $35 and board per month for old hands; $20 to $26 per month for green hands. Sand machine brickyard hands may be hired for from the price of a charge of rock salt to $20 per month and board. Good foremen, who are setters and burners, can demand from $60 to $100 a month.

Brian J. Dunn.

PROSPERITY INDEED—MANUFACTURERS MAKE A NEW RECORD.

American manufacturers made their highest record in foreign markets last month. The figures of the March exportations, which the Treasury Bureau of Statistics issued this month earlier than on any previous occasion, show that the March exportations of manufactures were $36,025,733, or more than 25 per cent. in excess of any preceding month. In March last year the exportations of manufactures were $28,214,450; in March, 1897, $25,876,861, and in March, 1896, $19,125,795. On only two occasions, March and December, 1898, have the exports of a single month ever reached $28,000,000, while in March, 1899, they were, as already indicated, $36,025,733, an increase of 50 per cent. over those of the preceding month, February, 1899.

Prior to 1897 exports of manufactures never averaged in any month as much as a million dollars for each business day; in five months of 1898 they averaged a million dollars for each business day, but it was left for March, 1899, to make the average of more than a million dollars for each day in the month, or an average of $1,400,000 for each business day.

Written for the CLAY-WORKER.

THE NEW YORK MARKET.

The BRICKMAKING SEASON for 1899 is well under way at the present writing, and fairly good weather has ruled. Nothing to brag or in regard to the drying ability of the wind. It has been mostly from the west and northeast, with but little heat from the sun.

If the oft repeated tale of the wind blowing from any direction, when the sun crossed the line on the 20th of March, were true, such would be the prevailing wind for the next six months. When the sun crossed at 2:29 p. m., March 20, the northwest wind was trying its best to blow everything to pieces, and kept at it all night and part of the next day. Since that date there has been but few, very few, hours of wind from that quarter, which for open yards is the best wind that can blow. Nevertheless, all the yards are in a hurry to get their first kiln in the market. Some will burn a very small one—about six arches.

GETTING READY TO MAKE BRICK

In the spring, a number of years ago, gave quite a good deal of work, and the further back you go the more of an undertaking it was. The present way of pumping the water out was not required then, as the clay bank was on a level with the yard, with from ten to forty feet of sand on top, of which some had to be carted or stripped off to get to the clay. The sand used day by day was enough to expose clay to last through the season. To-day what a change! It is the exhaust of the steam engine that is heard. As before stated, it was the removal of the sand to get to the clay. Now it is to remove water to get the same material, with this exception, that some yards get clay out of the Hudson river, and it does not pay to pump the river dry, so they dredge it out.

The man with the long-handled shovel is one of the hasbeens. After a continuous service from sand boy to, in some cases, foremen, and good ones at that, they were finally relegated to the sand bank to screen sand. During the week the church bell will be heard tolling, indicating a funeral. Ask some one who is dead, and the reply will most likely be—"Why, he was foreman for many years on Blank's yard." Yes, a familiar figure then, but as bankman he was not noticed. So the procession passes along.

"Clay? Is it not all gone at Haverstraw?" is a question which has been asked by those not conversant with that locality. Some, in fact, have the idea that all brick come from that place, as the consumers of ice, as they look at the ice wagons and see Rockland Lake ice painted on the side, believe they are being supplied with that grade of ice. Of the several millions of tons of ice used in the city, Rockland Lake will furnish about a quarter of a million of tons. If Haverstraw furnished the thousand millions of brick which are made each year for the New York market the town would have been a thing of the past. The great cry was, "Will the clay last?" The Egyptians said straw was required as well, just so the Haverstraw brick require something else beside clay. Sand, and good at that, was found a-plenty in times past. In the last ten years that essential has been getting scarce, and is brought to the yards from the sand bank along the Hudson river in many cases.

THE IMPORTANCE OF GOOD SAND.

Forty years ago Mudhole, now called Roseton, was noted for its quality of brick. Haverstraw was spreading out as a business center. To-day Mudhole proper has not a yard, as the Rose and Jova yards are on the Bancroft doors property north of Mudhole, but sand, in the near future, will be shipped from that point to Haverstraw. Eighteen years ago the yards on the Fishkill side of the river made a very inferior grade of brick, with one exception, the want of sand being the sole cause, and, when the sand question was discussed by one who had always used the best and plenty of it, and explained to the bosses that if they would they could go outside and buy it and freight it there, and put in enough to make their brick as good as the best, the reply was, "Why, it will cost too much; it will cost 25 cents more per 1,000 to make them." "If it does, you will be ahead," was the reply; "your brick will bring more." "Oh, no; they are only Fishkill brick, and you cannot raise them in price." The next question was: "Is Mr. So-and-So's brick bringing more than the general run of the yards here?" "Yes, from three-eighths to a half per 1,000." "How is that? You just said you could not raise the price because they are Fishkill brick." "Well, he takes more pains." "It pays him, does it not?" "He puts in more sand than we do; he has more of it than we have." "Do you not think that it would pay you all to make one trial of a kiln and see?" About a week after the owner of one of the barges carrying out of that bay was telegraphed to come to Mudhole to load sand. When loaded he was asked where to deliver it. "Bill Budd's brickyard, the man who makes the best brick at the Junction, and he will now make better."

Like advertising, it paid, and the rest soon after tried the addition of good, sharp sand with what they could get on the property, with the result that the despised Fishkill brick of that day is to-day as good as the best, and only because the owners did not take interest enough in their business to see that they could make as good brick as any one else if they would hunt for the missing link.

HE SMILES.

Who? Why, the brickmaker. He has been fed on the husks of little or no profits so long that now there is a change he thinks all his troubles are over. No more counting the cost on every little thing he buys. The floodtime of prospertiy is at the door. The papers report an increasing market for all products. Even brick are doing better, and, if he is a believer of all reports which come to him, it is something wonderful the number of brick which will be used the coming summer. Then he may be able to sell out to the—well, he is at a loss what to call it; some say it is a trust, others a syndicate, others it is a plan of the big fish to swallow the smaller ones. As for him he does not care what they are, so long as they pay him a good, big price. Is it any wonder he smiles, especially on the price he is going to get—in his mind? One cannot always tell how things may work. Appearances, and that timid of all timid things, capital, may completely dash all his bright hopes of this and coming years.

WHAT TO DO.

Last fall, wood being scarce, some of the yards had put off burning the last kiln. On one of them it was December before they were able to get fire under it. Twice they had to shovel snow off the top, and during the time when it was ready to set fire a very high tide overflowed the kiln ground. For about the space of twelve arches the kiln ground had settled some two or three years ago, so that the middle was at least ten inches lower than the sides, making a complete dish. It had been burned over several times each year, but why it had not been filled in and leveled off was, I suppose, because it was "good enough," and would cost money to put it in shape. It being lowest, the water soon found its way there and stood about four brick high in the arch. After the water fell off, severe cold weather came on, and the wet brick froze. The foreman had been second hand on the same yard for years. They set fire about dark. The next morning about 9 o'clock the arches began to drop in—that is, the jet brick, as the drying off had thawed the lower courses of the bench brick. The foreman sent for the owner to see what could be done—sent for a man who did not know anything about it, when he should have had sense enough to know what course to pursue. He seemed to lose his head completely. How to get the brick out of the arch was all his cry. He thought the best way would be to get a boy to go in the arch and throw them back to the mouth, which showed how far he was off. In the meantime the men who were helping around the kiln used whatever kind of tool they thought would work, and finally got the arches clear and fresh fire started in the arches, and thought their trouble over. When the kiln was nearly out, along comes another tide which would have put the fires out, but, by hard work of pick and shovel and horses and carts, a bank of dirt was formed around the kiln and the water was kept out. This spring a new hearth has been laid, and it is now level. The loss of brick in that kiln would have more than paid for laying a new hearth many times over.

Burning the first kiln in April is something that has not occurred in some years—that is, of brick made the same year. Some of the yards had a habit of keeping over two or more kilns through the winter and burning them in the spring. In this case they were 1899-made brick.

THE BRICK MARKET

Is a good one, and, what is more, the weather has been of the best for laying brick. From sixty to seventy barges a week coming on the market and taken up makes an active market, and gives the agent's brain a rest, for the buyer will hunt for him, as he is the man who wants to buy. He does not need to be coaxed to take a cargo, but is anxious to know what you have coming down the river. Prices since my last report fell off, but have regained all and more than they lost, and why should they not, and bring more money than they do? As the department stores say in their advertisements—from $5.75 up to $6.25 and $6.37½.

A. N. OLDTIMER.

HACKENSACK, N. J., May 5, 1899.

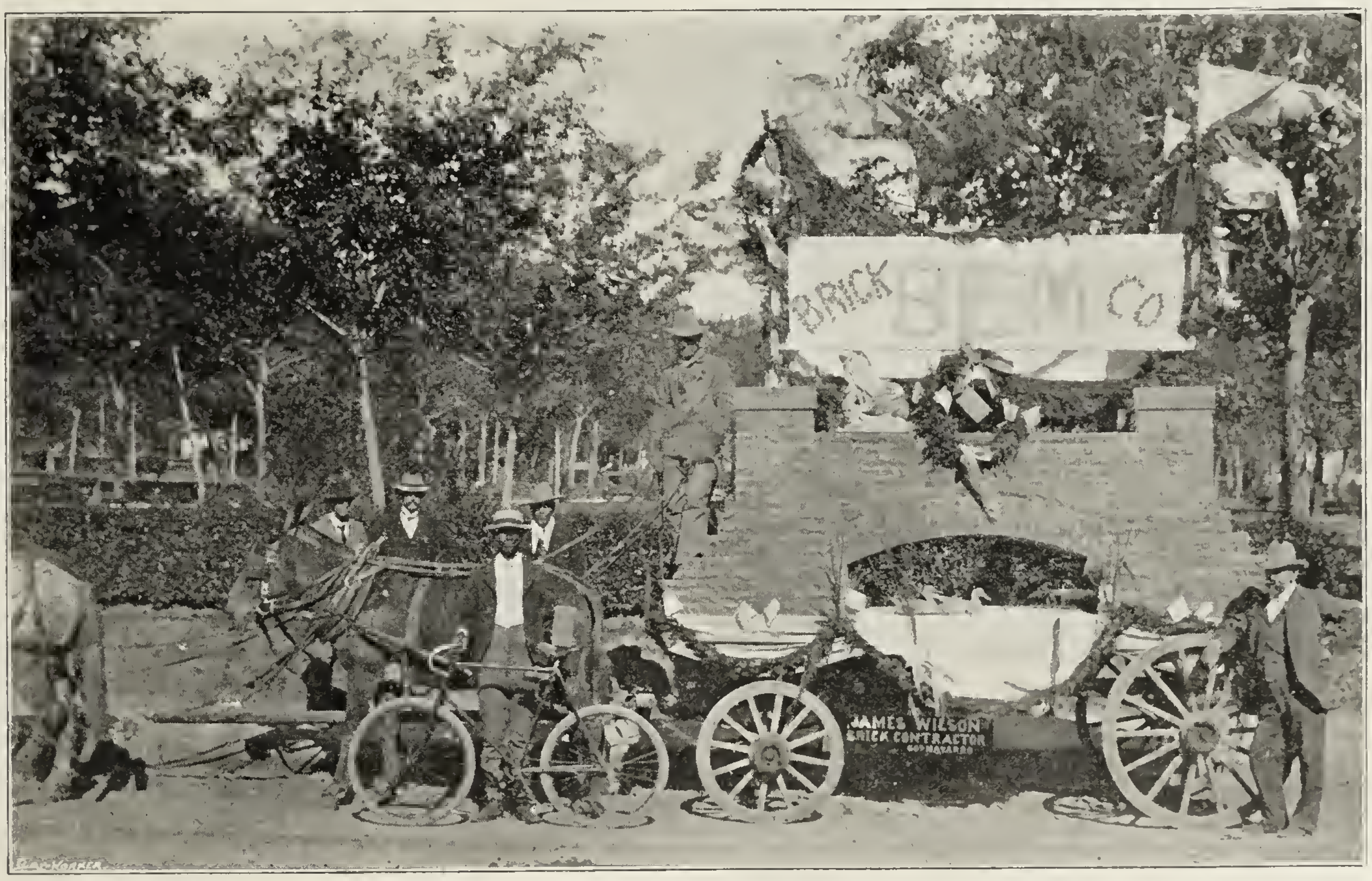
CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

An Attractive Brick Display.

Editor Clay-Worker:

I take pleasure in sending you money order for my yearly subscription to The Clay-Worker, which is a very welcome visitor. I would be very glad to see the editor himself here some time. He would find among other interesting things, that most of the brick here are not all like those he is accustomed to see in the North—at least so far as color is concerned. Our common brick are light buff, or, as the natives say, "white." A red brick is a novelty here. We have a vein of clay at our works that burns red, and consequently we expect they will be in great demand when the builders find they are not colored artificially and will not "fade out." We are rather proud of our brick, and took advantage of an opportunity afforded by an annual flower festival and trades display to make an exhibition, which proved quite attractive. It represented a park bridge built of pressed red brick, the butresses and coping being of granite brick. The arch spanned a stream on which several ducks were swimming. On the coping of the bridge two "gronies," or mythical manikins, who live only in crystal caves and guard all subterranean treasure coveted by man, were reclining, their beaming, good-natured faces lit up with a smile. Four corner posts on the bridge supported streamers, garlands, wreaths of cedar sprigs, with the letters Bem Brick Co., in red and yellow roses on a blue field on either side, and B. B. C. in red roses on yellow ground in cedar wreaths formed the front and rear ornamentation.



The Bem Brick Co's Float in Industrial Parade, San Antonio, Texas.

The accompanying photograph will give you a better idea of our brick float than I can convey in words. There were some eight hundred brick used, the load weighing fully 5,000 pounds.

Wishing The Clay-Worker the fullest measure of success, I am, yours truly, A. T. Beckman.

San Antonio, Tex., May 1, 1899.

A Brickmaker's Observations on English Brickyards.

Editor Clay-Worker:

I have no doubt but what you will think I am kind of slow about sending in my subscription. Well, it is better late than never. I would have been more prompt, but I have only quite recently returned from England, and I must say that before I left the old country I was of the opinion that we in America knew something about the manufacture of brick.

Of course, I did not see everything pertaining to the brick industry during my visit. I visited several yards in Sheffield that were making good brick, but there were others that seemed to be taking advantage of the scarcity, and anything that looked like a brick went. About as neat a yard as I came across in Sheffield was the one of the Sheffield Patent Brick Company, at Neepsend. They made about twenty thousand a day, some of which were repressed, and which were burned in a Hoffmann continuous kiln. They were setting their brick, as I thought, rather green, which caused them to slightly whitewash; otherwise the burn was good.

The Superintendent was very courteous. He took pleasure in showing me through every department, all of which seemed to be working as they should be. Each department was in charge of one man, and he was supposed to see that the work in his department was done right. When we came to the dryer I noticed it was the same old floor that was in use twenty years ago, or, I might say, one like it; that seemed to be the system generally, and, strange to say, during my stay in England I only found one man in the brick business that was in favor of the American system of tunnel dryer, and that was the gentlemanly Manager, Mr. Whitehouse, of the Nottingham Builders' Brick Company (Ltd.) They made by the stiff mud process, which seemed particularly adapted to their material, for in plasticity it resembles what we call soapstone in Illinois, or what some might call soft shale. They burn their common and some press brick in continuous kilns, of which they have three. One of them is equal to two ordinary kilns, as it has twenty-six chambers that are able to carry two separate fires. By so doing that one kiln burns about ten chambers a week, and I must say they were doing good work, and Mr. Whitehouse told me they were doing that kind of work all the time, and I wondered to myself why there were not more of those kind of kilns in America, especially where fuel comes high. A continuous kiln can be built of almost any capacity, and the greater the capacity the less cost per thousand to build and operate.

Well, now, I will give you a description of a yard that was about as crude as anything you would expect to find, and made the trashiest kind of brick that I ever saw. It is situated at Hillsboro, near Sheffield. It had two machines that made brick that went direct to the kiln, and the chief object on that yard seemed to be quantity, which was about fifteen thousand a day at the best. There was an attachment on the machines to regulate the amount of clay in the dies, but it was never used; consequently, some of the brick were overpressed and some so lightly pressed that I could take hold of a brick by one end and shake it in two. They were set in updraft kilns of about 3,500 to the arch.

Now, I have read a whole lot in THE CLAY-WORKER about covering the top of the kiln with damp clay in order to hold the heat. It was put on in this yard, and so thick and tight that for quite awhile after they got through with what they called "earthing in" it was not safe to go very close to the fires when firing, as a flame would rush out of the furnace simply because there was not sufficient draft in the kiln to take it up through the brick, consequently the heat was held in the arches, and the brick above five or six courses over the arches were what we would call soft. And then the kiln walls were like sieves, so that when there was any draft there was a plentiful supply of cold air going in. They would also dump their clinkers and ashes against the ends of the kiln in order to keep the wicket warm. They did not know they were simply hiding cracks in the wall. Of course, that was immaterial with them, as they would not daub them anyway; consequently there would be one of those troublesome cold spots.

I remember reading in THE CLAY-WORKER some time ago of some one having discovered how to overcome cold spots, but he was not kind enough to tell the readers of THE CLAY-WORKER how, or, I might say, what few do not know. I will do so in small space: In the first place, set the brick uniformly, so as not to block the draft in any place, and keep the walls air tight. Then it is good-bye cold spots, unless some place happens to get choked up with soot, and that will burn out in short order if the whole thing isn't a cold spot.

GEO. E. DERRY.

St. Louis Notes.

Editor CLAY-WORKER:

The St. Louis Architectural Club has just closed another of its annual exhibitions at the Art Museum, which was a very creditable affair. Not only was there more excellent designs by the St. Louis architects, but there were liberal contributions from the Boston, New York, Philapelphia, Washington, Pittsburg and Chicago clubs. These broad-gauge public exhibitions are excellent educators of the public; they are a valuable stimulus to the profession, and a welcome event to the material men and the clay men in particular.

The building trade is again getting into a good, healthy condition in St. Louis, and the great improvement in general business has at last struck the architects and builders, when their patience had been almost exhausted after the past four dull years.

Brick are now selling at healthy, satisfactory figures, and, as a rising market is always a vigorous market, the sales are very satisfactory in volume as well as price, as common brick are bringing $6.25 to $7.50, strictly press brick from $12 to $15, and the buff from $17 to $23, according to design and color. Six months of winter, a rainy fall and wet spring have something to do with it, but the leases made by the Hydraulic Co. of the College Hill Press Brick Works, American Press Brick Co., yards of H. C. Koenig, Blow Brick Co., Enterprise Brick Co. and Schwer Brick Co., a working arrangement with Superior Brick Co. and Anthony Ittner, had a good deal more influence on the market than the rainy season. Dry clay is very scarce. The frequent rains prevent clay gathering, and it would not be surprising to see brick go to $8 and $9 per M before June 10. The yards out of the deal are the old National (now Continental), Progress Press Brick Co. and the Sanders Brick Co. The American Hydraulic Co. at Collinsville, Ill., was taken by the Hydraulic Press Brick Co. of St. Louis, by the purchase of a controlling interest of the stock. It is said that this is the first time the old Hydraulic ever bought a brickyard.

W. P. Grath now controls the Illinois Supply and Construction Co., Mr. W. M. Loudermann retiring and going with the American Hydraulic to the Union Trust Building. The Superior and Anthony Ittner are doing business at the old stand, as usual, only they follow the market, and the market is made by the combine, so to speak. The leases above referred to were made for two years, with the privilege of three years.

The clay interests as a whole are having a remarkably good trade. Most of them are behind with their orders and at advanced prices. The old National Brick and Quarry Co. were closed out by the bond holders and reincorporated as the Continental. They have enough clay in their sheds to make 3,000,000 brick, and are running full time. A number of the contracts for city paving and sewers will soon be let.

The World's Fair fund is growing slowly, and prospects are favorable for a mammoth exhibition in 1903. Quite a number of large commercial structures are under way. The office building at Sixth and Olive streets, white brick and terra cotta, will soon be under roof. The out-of-town demand for front brick is good, and keeping pace with the "signs of the times."

The Kulage yard, in North St. Louis, has been closed down, as the clay supply is nearly exhausted, and it is too far from the railroad to ship in the clay from the country. Mr. Kulage is now going to push his new brickyard near Chicago, which is a fine modern plant, for the northern market.

In common with most of our brick concerns, the veteran brickmaker, Anthony Ittner, is just now somewhat embarrassed for want of clay. Not that his clay land has been stripped or the supply of raw material exhausted—far from it—for he has an almost unlimited quantity in the bank, but very little under the clay shed. Dry-press brick manufacturers have to gather their clay in dry weather, and the spring has been so rainy that Mr. Ittner has not been able to lay in sufficient to keep his machines going very long at a time. A few dry days and the situation will be changed. Once a supply of clay is harvested and his machines will be run to their full capacity for the balance of the season. A SAINT.

A Delayed Convention Echo.

Dear CLAY-WORKER:

As a charter member and twice former Vice President of the N. B. M. A., the undersigned read with much pleasure of the Thirteenth Annual Convention of that body, held at Columbus in February. I read all the proceedings, and was much instructed and entertained. I was sorry, although so convenient to my home, that circumstances did not permit me to be present. I see the old guard were all there—Ittner, Purington, Flood, the McAvoys, the genial and witty Gates, who, as usual, opened the flood-Gates of his eloquence; Eggers, Sibley, Albertson, Adams, Lovejoy, and a host of other new fellows—and what an addition you must have had with the new faces—Bloomfield, Plumridge, Manson, Wheeler, Harris and others too numerous to mention! How our quick friend Craft, with his ever-ready repartee, must have been missed, and then the honored dead! How they appear in my mind—Chas. P. Merwin, Thomas Moulding, John McCain and James Taylor! They are making beautiful brick, studded with jewels, in the Celestial City. How their genial faces appear before me now! But they are just away a little distance beyond us, and with the dead all is well. Success to the N. B. M. A., and may I be spared to attend many of the Conventions. B. W. Blair.

Cincinnati, O., April 11, 1899.

Coking Table Furnace Experiments.

Editor Clay-Worker:

During the past month or two there has been some interesting experiments going on at the brick and tile factories here in Montezuma. Three different coking table furnaces have been on trial. Each one has demonstrated that this method of burning with soft coal is both economical and effective. The last of the three tests referred to was made under the direction of Mr. W. C. Mitchell, who claims that it demonstrates the superiority of his furnaces, the burn being quicker, better and with less fuel than was consumed in the previous experiments. His second burn was completed in ninety-seven hours, and consumed fourteen tons of slack, being less than half the quantity required in one of the first experiments. This may be due in part to Mr. Mitchell's skill as a burner. He, however, thinks that it fully demonstrates the superiority of his system. However that may be, those who have watched the experiments are agreed that the coking table and furnace system is a big improvement over old-time methods of burning both brick and tile. Those who are using soft coal will find it to their advantage to investigate this system.

A. Burner.

Notes From Jersey.

Editor Clay-Worker:

The factories in this part of Jersey are still putting out material at a fair rate of speed.

Last week what promised to be a rather warm time at the Standard Fireproofing Co.'s plant in the way of a strike of the laborers was, after having our sheriff on the ground with about seventy-five deputies to keep matters from getting too bad, finally cooled off by the firmness of Robert Lyle. We can just imagine how the above gentlemen would take to those who represented the strikers. Our friend Lyle is quite a diplomat when necessity arises, but, oh, my, if a fellow needs jacking up, why, he is right there to give it to you. After several days' shutdown the trouble was settled, and the men went back to work at the same old price.

A strike is on tap in the up-river region again, and, if the men stay out, A. N. Oltimer will have another chance to figure out the possibilities of a rise in the price of brick.

Since the first day of April the weather for outdoor work has been very fine—sunshine and brick wind every day so far.

Building operations in Perth Amboy are not on as large a scale this spring, so far, as for the past three or four years. However, there are some plans out. Among the largest is a high school building, which is to be of brick, a terra cotta of handsome design.

About one new school building each year is Perth's rate of growth, and, with the new trolley line to be built this season, the city will be more up to date than ever before.

W. R. Osborne.

Brickmaking in the South.

Editor Clay-Worker:

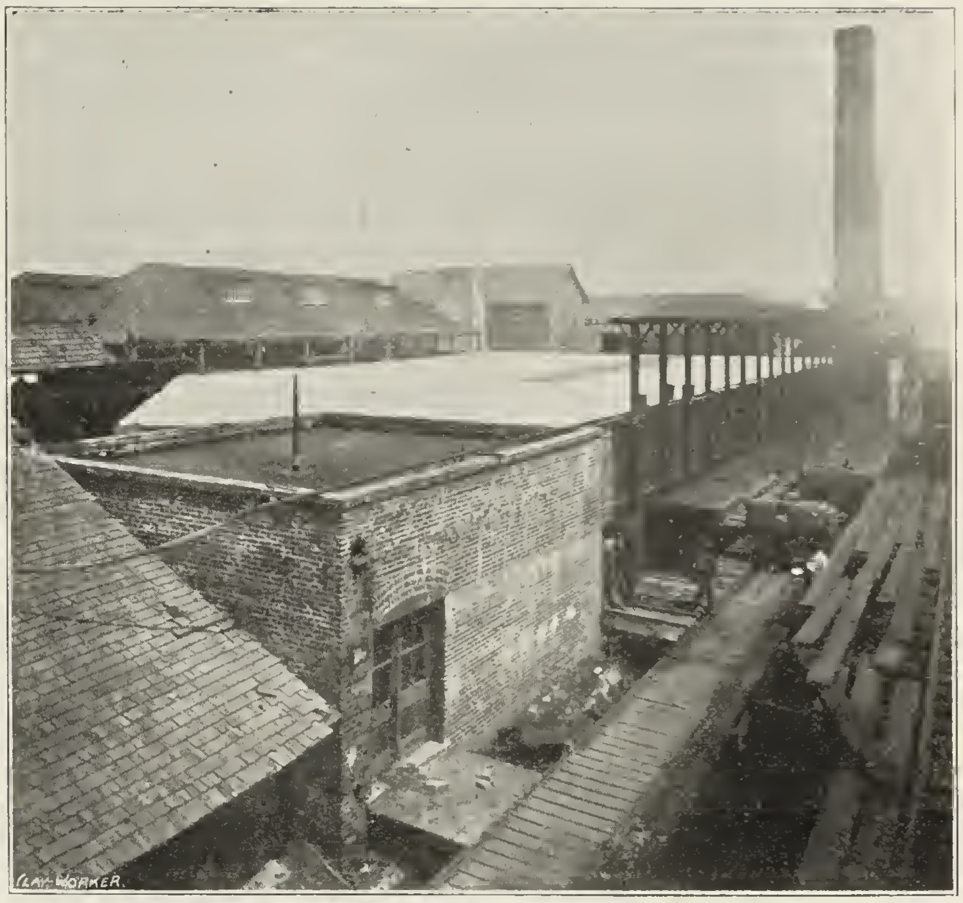
Perhaps it would not be out of place for your good readers to know that the brickyards in many of the Southern cities are now running on full time.

There are several good brick plants in and around Atlanta, Ga., all of which are doing a thriving business. Atlanta is now putting up quite a number of large buildings. The railroads centering in Atlanta are soon to have a splendid modern depot building, the details of which have not been fully determined. Many of Atlanta's streets are paved with brick, and doubtless many more will be paved with brick in the near future. Heretofore nearly all of Atlanta's paving brick have been shipped from the North—in fact, all except those shipped from Coaldale, Ala.

Doubtless, sooner or later, some enterprising clay man will find in some of the hills or valleys hereabouts clays suitable for a first-class paver. The Rome Brick Company, of Rome, Ga., has furnished a very fine grade of press brick to this market.

The Chattahoochee Brick Company is turning out a No. 1 quality of building brick, and is running on full time, with orders ahead. The Palmer Brick Company has a large plant, turning out both common and press brick. This plant has both the up-draft and the down-draft kilns, having recently put in one of Eudaly's up-draft kilns, with a capacity of about 800,000. The Palmer plant is well located, being within the city limits and on four lines of railroads.

The Chattahoochee Company, though not within the city limits, is well situated for shipping facilities, and has a large trade. This company recently added to its plant a new "A, B, C," brick dryer, which it commends very highly, as the reader may see by turning to the back cover page, where, in the ad. of the American Blower Company, is given a flattering testimonial letter.



The Chattahoochee Brick Co's New "A. B. C." Dryer.

We think that every one will agree that the brick industry has greatly improved in the South within the past few years, not only as to quality of materials manufactured, but as to the number of brick being used.

No section of the country realizes with so much force the importance of making good, hard, No. 1 street paving brick, if for no other reason than that from a sanitary standpoint. Clean, well-sewered and well-paved streets tend, more than any other one thing, to produce a healthy, vigorous city, and no pavement, all things considered, is so cheap, clean and durable as a good, No. 1 vitrified brick pavement. Anon.

Atlanta, May 1, 1899.

GOOD MAN WANTED.

A responsible firm wants a reliable and experienced man to take the superintendency of a modern and well equipped dry-press brick plant. The right man will be paid a good salary and employed permanently. Must be temperate and thoroughly understand the business of making and burning press brick. Address READY, care Clay-Worker, Indianapolis, Ind.

A Brickmakers Trip South.

To the Clay-Worker:

Having been absent from my usual stamping ground for two months, I am hardly prepared as yet to say much about the workings of the various factories hereabouts except from inquiries I have made since my return home.

In the middle of October we started on a trip south, having never been further south than Washington, D. C. up to that time. We left Jersey with a very indefinite knowledge as to our ultimate landing place.

First stop Philadelphia, the city of brick. Taking the B. & O. the next morning for Baltimore, we found ourselves getting into pretty warm weather. As our stay was also short here, we were unable to see any of the sights, but during a walk of some blocks made up our mind that Baltimore was a hustling, thriving city. Still moving south, we finally came to the national capital, and now what can one say of that beautiful city that will be new to your readers? Never on our several previous visits being able to stay more than five or six hours, our opportunities for observation were, of course, limited, so this trip we made up our mind to stay several days. It it needless to say we were surprised at the many public buildings and business houses, etc. Many are very beautiful, and one can only think while looking on the government buildings this is the greatest nation on earth, as our own young hopeful wrote us during the late war with Spain, "Papa, aren't you proud we are all Americans?" Being on other business, we did not look up the brick factories to see what they were like, but judged from the many brick buildings there must be some few thousand made thereabouts at least.

Still southward our journey continued, arriving in Richmond, Va., on a hot afternoon, after a ride of several hours through some very dreary looking country. Indeed, we were very much surprised at this part of our journey, my impressions having always been that the country through Virginia was thickly settled, but hardly a town of any importance did we pass.

Richmond, Va., is, so to speak, a city of brick. Many old, old brick buildings show marks of time, and we could not but wonder how the city looked the day the "rebs" were leaving and the "yanks" were coming in. Surely it must have been a sorry looking place from all accounts. Having so recently left Jersey, where the ground is, as a rule, quite level, we could only contrast the steep, hilly streets with some of our western Pennsylvania streets. Richmond is quite a trade center. Many wholesale houses draw trade from away south in the Carolinas and Georgia. The State Capitol is on a beautiful site, and while we were viewing the beauties of the city we met many of the 3d Virginia boys, who were then waiting to be mustered out. How queer the thoughts were to me while looking at those young men in Uncle Sam's blue. A short time, or rather short life-time before, the writer's own brother was in that same city with the conquering army. Then possibly the fathers of these same young men were bitterly opposed to the Union. That these same young men of 1898 were gladly offering up their lives for God and humanity. Truly, we are a great country. We noted many fine brick buildings in this city and evidence of thrift on every side. One night in this city, then on to North Carolina. How can pen describe the queer sights one sees while on a trip of this kind. Of course, the prevailing color is dark in the South. Darkies everywhere, even the firemen and brakemen on the railroads are colored men, working day in and day out with no earthly hope of promotion to a higher place.

At Petersburg we saw our first ox cart; one ox, two poles, with an axle and two wheels composed the outfit. Of course, the ox was hitched to cart by use of a yoke with ring on each side of neck to fasten poles to. This town looked too dead to bury from the car windows. In a conversation afterwards, I was told that most of these old towns had not improved one iota since the rebellion, and, indeed, they looked it.

About 135 miles south of Richmond we found Rocky Mount, N. C. Here we stopped eight days. This town has quite a number of brick buildings, but the majority are of wood. Very few houses in this part of the South have cellars, and consequently few brick are used. We asked the reason for this, and were told that it was unhealthy to have a cellar under a house. Rocky Mount is in the heart of the tobacco raising district. Large warehouses are here for the storage of the crops until shipped. Peanuts, cotton, a little corn and "niggers" appear to be the principal crops.

After eight days here we travel thirty-five miles to Roanoke Rapids. This is a new cotton manufacturing town, five miles from Weldon, on the Atlantic coast line. Here we find two large brick cotton mills, power furnished by water from Roanoke Rapids. If this power was near a Northern town there would be millions in it. Ten thousand horse-power is now harnessed. The mills spoken of use perhaps 1,000 horse-power, not one-third of the river used. The brick for these buildings were made right on the ground by convict labor hired from the State. The town is on a beautiful site, some sixty or seventy feet higher than the mills, and slopes on all sides, making the drainage perfect. Elegant water is found at a depth of sixty feet by drilling wells for same. The business buildings are of brick, but all dwellings are of wood; rather tastely laid out streets at right angles, and graded nicely, but here, as elsewhere, we note the prevailing habit of building the houses on brick piers. This makes a very small consumption of brick per house.

Being in this town during the late election, I had an excellent chance to see just how the votes were cast. Of course, it was a desperate election in North Carolina. The white man against the black man, with many more of the darker shades, the chance seemed almost hopeless to one who never saw the methods used as were used here. Every man was loaded for bear, and determined that the white race should govern the country. The colored men collected on one side of the voting place and voted in squads, then fell back for the whites to get a shot. When the votes were finally counted, it was found that the majority were white or Democratic votes, and some of the soreheads were cruel enough to say that men voted that day who had not voted for the past eight years, 'cause they had been buried that long. Of course, I wouldn't like to say that. I thought there were so many twin brothers in that country, but it was a fact that I saw so many white men putting in votes who I could have sworn looked just like somebody else who I had seen vote several times before. Had it been on the other side perhaps I would'nt have noticed it, as "all coons look alike to me." Going south as a Republican, I became for the time being a Democratic convert. But thank the Lord I am saved once more, and am back in God's country. Northern capital can and is doing much to develop Southern resources. The farming, such as I saw in this part of the State, is nil, with cotton at five cents at the mills. I can see where the manufacturer can realize handsomely on his investment, but the poor colored man will be poorer the longer he lives. The soil is worked to death on the shares plan, and the results in the future are hard to foretell. There are 160 cotton mills in North Carolina, and 165 in South Carolina, with others in other Southern States. The labor in these mills are (with the exception of foremen, who are either from the North or of the better class of Southern men) of the poor whites. Most of the women rub snuff, and many small boys and girls of ten to twelve years are employed for twelve hours each day. The schools are usually open four months of the year, with separate schools for whites and blacks.

After spending seven weeks in that State, we were notified of our better half's illness, and feeling that we could do no better there than in good old Jersey, we started back north, well contented with our trip, and with our ideas somewhat broadened in the way of comparison. We must acknowledge we met many pleasant gentlemen while there, men who were hustlers, and could make money out of the opportunities at hand. But our whole impression is that it will take a generation or so yet to place the South where it should be. We mean, of course, this particular part of the South which came under our immediate observation. Clay is to be found everywhere, but as the country is so sparsely settled there is no demand for clay manufacturers. Fuel is cheap enough. Yellow pine wood sells at $1.25 per cord delivered. As it is full of rosin it makes a hot fire, but to gain a market for brick they would have to be shipped too far, and it would not be profitable. Colored labor can be had for sixty cents per day. Good board at $12.50 per month, and for those who like them, hot biscuit three times a day.

JERSEY.

Cincinnati Brick and Building News.

Editor CLAY-WORKER:

The season is very backward in Cincinnati, owing to the long winter. April 11 was the first good day since last fall. Our brick manufacturers are getting ready to start up. This promises to be a very much better season for building than last season, as building inspectors' reports show an increase over the same month last year:

March, 1898, building permits	$185,485
March, 1899, building permits	251,190

The above notwithstanding a bad winter and an especially cold February. There is every prospect that the summer and fall trade will be large, as a central depot is projected, a large warehouse, nine stories high, and the Gibson House building, ten stories, on Fourth street, will materialize in the fall. Many factories are in process of erection in the western part of the city, along Colerain and Spring Grove avenues. Another good thing for the brick men is that their stock is all sold out, and scarcely any brick on hand.

J. C. Schmidlapp, the banker, and others will put up a skyscraper next to the Gibson House, on Fourth street, and B. H. Kroger, the successful retail grocer, who runs some thirty stores, will erect an immense warehouse on Eggleston avenue. A large railroad depot is contemplated on West Fourth street. In the western part of the city, Colerain avenue, where were formerly truck gardens, many large factories are started and others projected. In other words, this old, lethargic town has thrown off its sleepy way, and promises to build much. One good sign is that about all our manufacturers of brick have sold all their old stock, and there is very little or no brick left from last fall.

The Westwood Brick Co., J. M. Gamble, manager, have sold all last year's output, have a good business, and will supply one sewer with nearly two millions of brick.

The Maysville Brick Co., A. C. Sphar, manager, is doing a good business, and have all their season's brick about sold, and, therefore, will run full capacity of four million brick.

Alfred Clark, Dayton, Ky., has sold out, and the prospects are good for the season. Their capacity is nearly three millions.

The Batavia Pressed Brick Company is fortunate at the opening of the season in having its stock about sold out, and cannot fill orders before making new brick, and the company is greatly encouraged because of the favor with which its product has been received by architects and builders. The J. M. Blair Brick Company is getting ready to make brick, and reports stock all sold. The Mitchell Brick Company's stock is all sold, and the company is getting ready to manufacture, with a prospect of good trade. The Busse Brick Company has no old stock, and is making new. The Cincinnati Brick Company has a million brick on hand, but will soon find a place for them before its new stock is ready. Geo. H. Bruns, a member of the N. B. M. A., reports as above. Mr. Bruns is enthusiastic over the last meeting of the N. B. M. A. at Columbus. He came back all smiles, and interested the members of the Builders' Exchange with his stories of that model Convention.

BROTHER WATKINS.

CINCINNATI, May 1, 1899.

THE FIRE-PROOFING PROBLEM.

SOME COMMENT and one or two protests were aroused among manufacturers of fireproofing material some time ago by the statement made to an Evening Post reporter that a number of the so-called fireproof buildings in this city and elsewhere were far from being exempt from certain dangers attending large conflagrations. Since then a careful search for information among the trade itself has established the validity of the statement as far as it went, and has thrown some further light on the question.

"All noncombustible material," said one prominent fireproofer, "substances, such as terra cotta brick, cement and the like, will not ignite, and is in that sense fireproof. But you are right in making the distinction between a building's being 'fireproof'—i. e., noncombustible in itself—and its being safe from the danger of collapse under the intense heat generated, either by a blaze of furniture and fittings within the walls or by some adjacent conflagration. As you say, the whole thing rests upon the strength and resistance of the nonconductng materials that inclose and protect the iron structure from heat. And the fact is that to-day there is on the market some, I will not say how much, material which masquerades under the name of fireproofing, and which is positively no safeguard against the attendant dangers of a conflagration.

"Take fireproof brick, for instance. It seems paradoxical, does it not, to say that bricks to be fireproof should be waterproof as well? But such is the fact. There are to-day on the market a good many bricks which during a fire will heat red hot. The iron structure which they inclose is safe enough until the steam from the hose—cold water, mind you—strikes them. Then there is a sudden contraction of the material, which cracks, and, under the tremendous force of the solid column of water hurled at it, it 'peels off,' as we say, and exposes the iron and pillars and beams which it was there to protect. If the fire keeps on for some time longer the iron structure will certainly suffer, and there is danger of collapse.

"The whole matter hinges on the greater or lesser porosity of the hollow bricks. Their being porous is what enables them to resist sudden contraction without breaking and 'peeling off,' and the unsafe bricks on the market are those that are 'dense'—that is, not porous enough to allow for the sudden shrinking under the cold water of the firemen's hose.

"Porous bricks are usually made to-day by mixing sawdust, or some other substance that will burn out with the clay before baking. Under the intense heat of the kilns the sawdust is burned out of the brick, and the interspaces thus left give the finished product its porosity. Now, sawdust is dear and constitutes quite an item of expense when used as we use it—by the carload or boatload. Some firms try to economize on sawdust; others, from the location of their works, cannot get it easily. Hence, the amount of dense brick on the market. You have easily to compare the broken surface of this with that of a really porous brick to see the difference. But the dense bricks are, of course, the cheaper, and so are sometimes preferred by builders.

"Another fact that militates against the safety of a fireproof brick is that the architects and builders naturally seek to minimize the strain on their iron structure, and demand the lightest bricks they can get," said another manufacturer. "As you may notice, the bricks, besides the porosity of their material, are hollowed—have holes cut through their length. The larger the number of holes, the lighter—but weaker structurally—is the brick. Some Chicago concerns make a brick which is completely hollow, save for a narrow transverse strip through the middle. Others make a solid brick, with a certain number of cylindrical holes through it to give it lightness. Those are the two extremes, and it is a nice question to find the mean between them."

The prices of hollow and porous brick have fallen considerably of late years, notwithstanding considerable effort on the part of certain manufacturers to keep them up.

Some three or four years ago the Central Freproofing Company was organized in New Jersey. It consisted chiefly of the Raritan Hollow and Porous Brick Company, the New York and New Jersey Company (founded by Jacob Lorillard), the Staten Island Terra Cotta Lumber Company (in which Addicks, of Delaware, is largely interested), and the Standard Company. The object of this combination was evidently to keep up prices. For some time the Central Fireproofing Company was successful, but of late several firms have dropped out of the trust, and its object, according to many in the trade, seems to be very near defeat. It is alleged, however, by some that it has, whether consciously or not, afforded protection to some manufacturers of an inferior article.

"The tendency is toward a more and more pronounced porousness in bricks manufactured to-day," said the head of a prominent firm which manufactures in New Jersey. "Needless to tell you, the manufacturer has taken immense strides in the last fifteen years. Labor under disadvantages? Of course we do sometimes. One of the greatest of these is soon to be remedied, I hope. As you know, manufacturers of fireproof bricks simply sell their product, which is set by bricklayers who are often incompetent. Sometimes the bricks may be so badly laid as to cause danger in case of fire. In view of this there is under discussion a project to have the manufacturers set in place their own bricks in the new buildings that are going up."—*New York Evening Post.*

TURNING LARGE POTS ON MACHINERY.

A REMARKABLE POWER JOLLY.

WHAT POTTERS have for ages considered an impossibility has at last been accomplished, and pots or jars of almost any desired size can now be turned out by machinery.

The device, which is the invention of Mr. C. D. Weeks, an Akron potter, is remarkably simple, but embodies a new and novel mechanical movement.

The illustration on page 483 gives a partial idea of the construction and operation of a machine that will undoubtedly revolutionize the potters' trade, for it does the work of turning or pressing jars much faster than it is possible to do it by hand.

Turning large jars in the old way is exceedingly difficult, but with this new machine it is just as easy to make a sixty, eighty or hundred-gallon jar as one a tenth that size—much easier, in fact, than it is to make a five or a ten-gallon jar by hand, and the machine-made ware is really better in every way.

MAKING SIXTY-GALLON JARS.

The machine has been in use at the pottery of F. H. Weeks, at Akron, for several months, and has proven equal to every need. The operation of the machine is simplicity itself. The clay is "wedged" or kneaded in the usual way, and a charge of the proper size and weight placed on a round wood pallet and placed on a swinging crane within easy reach of the machine operator. The bottom of the jolly is brought to the top of the die, or metal jacket, in which the pot is molded, by simply turning a crank, and the pallet and clay is swung round and deposited upon it. The bottom plate is lowered into place, the crane swung back, and, by a movement of the foot, the belt beneath is shifted and the die or mold revolved at a high speed. The operator then brings the plunger into play. It is a long, round piece of polished metal, tapering from the center to the ends. It is suspended on a movable arm, and is lowered into the die and adjusted to the proper angle by the turning of a wheel.

Quicker than it takes to tell it the clay is pressed into shape. The plunger slowly rises, and as it clears the top of the die is swung to one side, the belt shifted to the loose pulley, and, as the revolving motion ceases, the bottom plate bearing the jar is raised. A truck is then run beneath the pallet, and the jar wheeled away to the dry room, easily and safely.

To prevent the clay sticking to the side of the die a piece of ordinary oil cloth, such as is used for floor covering, is placed inside the die, first being well greased. When the jar is lifted from the die this oil cloth is removed, leaving the surface of the jar perfectly smooth.

This latter feature of the work suggests a new field for experiment. By using embossed oil cloth, ornamental surfaces can be obtained with virtually no extra cost of labor.

This machine is indeed a remarkable invention. It is manufactured by Taplin, Rice & Co., Akron, who have made a speccialty of pottery machinery for many years, and who will gladly give any further information that our readers may desire relative to this or any other of their clayworking machinery.

KILN TESTS.

THE CLASS IN CERAMIC CHEMISTRY OF THE OHIO STATE UNIVERSITY AT SHAWNEE, O.

THANKS to the courtesy of Mr. W. D. Richardson, general manager of the Ohio Mining and Manufacturing Co., it was the good fortune of the chemistry class and the instructor, Mr. Bleininger, to spend several profitable days at the works of the company, engaged in testing the conditions of firing during the last three days of a burn. It was especially desired to obtain data in regard to the conditions prevailing during the flashing stage. For this purpose a small, most excellently built, square, down-draft kiln, holding some 6,000 brick, was set and put through the regular burning process for flashing. It was the business of the students to collect data in regard to the composition of fire gases, the temperature, intensity of draft and weight of fuel used. For determining the constituents of the gases the Orsat apparatus was used; for the reading of the temperature and intensity of draft an electric pyrometer, which Professor Orton had kindly permitted the class to take along, and a U tube gauge, with magnified reading were employed. In order to represent the temperature conditions graphically, the temperature readings, taken every fifteen minutes, were plotted so that the effects of firing and cleaning could be readily detected. Also, the temperature difference betwen the kiln and flue was determined. Equally interesting was the rate of cooling after closing the kiln, showing strikingly that the rate of cooling becomes slower as the temperature is lowered. The boys worked in three shifts of eight hours each, and they seemed to enjoy their task immensely. As a result data was collected sufficient for several classroom discussions.

It is in this spirit that we must approach the problems of the clayworking industries as yet unsolved, and, in looking upon them in the proper light of both practice and theory, we may hope to arrive at a definite understanding of the principles involved.

Great interest was taken in the experiment by both the foreman and the head burner of the plant. Mr. Gould as well as Mr. Goldner did all in their power to make the test a success. With such men actively engaged in the business the course of clayworking will ever be onward.

OBITUARY.

Green B. Boren, general manager of the Eastern Shale Paving Brick Co., died at his home, in Catskill, N. Y., May 14, of consumption. Mr. Boren was 46 years old, and had been manager of the plant since it was first started.

THE CLAY-WORKER

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SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXXI. MAY, 1899. No 5.

CURRENT COMMENT.

May time is a busy time with the brickmakers this year. Throughout the length and breadth of the land the trade is once more in that happy state wherein the demand for brick largely exceeds the supply.

* * *

Starting way down in Maine, the welcome cry, "More brick," is heard on every hand. Gathering force as it goes it rolls westward, until in far-away Oregon it assumes an agonized wail. There is a brick famine in Portland, and prices have gone up to fourteen dollars a thousand for common builders, and they are hard to get at that.

* * *

We congratulate those of our readers who, acting on THE CLAY-WORKER'S advice, made ready for the busy time by putting their plants in order during the dull months. They will now profit by being the first on the market with a new crop of brick. Luckier still are those who have held back their stock for just such a market. It is to be hoped that when normal conditions again prevail that prices will be kept at a reasonable figure. There will be neither sense nor reason in again reducing prices to the danger line, where they have been for the past few years.

* * *

During such an epidemic of trusts it would be unreasonable to expect the clayworking interests to escape the seductive promoter. He has been dallying with almost every branch of the business, but to date has, we believe, captured but one—the sewer pipe interests have been consolidated, with a capital of $25,000,000. The principal plants are said to be included, and were appraised at $8,000,000. It is claimed that the consolidation will result in a net profit of more than $900,000 a year. With such a flattering showing and such a vast body of water—extending between eight and twenty-five millions—it ought to be easy to float the enterprise. Still, those looking for an absolutely safe investment might better consider a government bond.

* * *

With the coming of spring, cycling again becomes the ruling pastime. So numerous are the devotees of the wheel and so enthusiastic that they constitute a formidable faction in every community. It behooves those hankering for political preferment in large cities to pay respectful attention to the needs and wishes of wheelmen. Hence, there are now on the boards many projects for the improvement of roads and paths. This will help on the cause of brick pavements, for most cyclers prefer a good brick pavement to any other. A wheel seldom or never slips on a brick street, wet or dry, while a wet asphalt pavement is absolutely dangerous. Paving brick men will find wheelmen good people to cultivate.

PAINT AND BRICK.

"Dab the man who paints a brick wall," said a friend to us, recently, as we were passing a large brick building, the face of which was being coated with drab paint. We wish we could. Why should a brick wall be painted? It does not cover bad workmanship, and it does place a fixed charge upon that building which it must necessarily carry throughout its future. In the matter of the cost of the maintenance of a brick building, insofar as it relates to the outside, it might as well be frame as to have been painted. The painting of a building material, which by acknowledgment is the best known, is incongruous. There is no justification from any point of view in painting brick. Habit in some things is stronger than reason. Aesthetic blood does not flow in all our veins. Not all of us have reason for what we do. We wish we could "dab" the man who paints the brick wall.

BRICK HOUSES.

We print elsewhere a picture of the early home of William Henry Harrison—a brick house, probably the first brick house built west of the Alleghenies. What would have become of a frame house in that time? What would it have cost to keep it up? Think of the bill for painting! The amount of building of shabby frame houses is simply appalling. The waste of money therein is inestimable. An architect who, through the necessity of his profession, built large numbers of frame houses at a time in the business history of the country when there was little other building to be done, said to us: "I have watched for many years investments in frame houses, and am convinced no one can afford to build of wood for investment. For the first few years it may figure all right, but the return for the frame property must be so large that not only must it pay fixed charges in the way of taxes, insurance and interest on investment, but in the end there must, of necessity, be a sufficient amount laid aside to pay for the cost of the improvement. In time the property reaches that stage when it will not bring its initial rental, when the building is too poor to pay, and when the owner has not nerve enough to tear it down. The history of frame-house property is that during a period of from twenty to twenty-five years there should be set aside not less than 6 per cent. for insurance, taxes, repairs and general depreciation. What property is there that will stand this?

BRICK AND TRUSTS.

We think the brickmakers of the country are to be congratulated upon occupying a unique situation which renders all but impossible the formation of a national brick trust. The trust spirit of the present time makes one tremble. As we see it it is merely another kind of inflation—an effort to make money out of wind. A great deal of the stock which is issued in connection with these trusts has no more material value than poker chips. Properties are inflated to many times their value. Probably an effort will be made to pay dividends on a certain large part of this stock. The result cannot be questioned. In the first place there will be an effort made to reduce wages. Again, there is the temptation to reduce the quality of the goods. But, despite it all, there must come an end. Corporations which are watered to the extent in which we find many of these trusts must eventually go into liquidation, and the end will be that many people who have built up nice, clean establishments will find that they are out of business and out of property. Think of a concern representing probably $60,000 in capital under private management receiving $250,000 in stock for the plant! Some of this stock will be sold outside, and somebody will get hurt, and, we fear, it will seldom be the instigators of the trusts.

WANTS BRICK MACHINERY.

Mr. G. W. Wepfer writes us from far-away Johannesburg, S. A. R., that the building operations in that part of the world are already extensive, and must grow rapidly, as the country is prosperous. Some months ago Mr. Wepfer purchased from J. W. Hensley, of Indianapolis (whose address he obtained through The Clay-Worker), a soft-mud brick machine and other brickyard equipment and has superintended its erection. Mr. Wepfer is in touch with manufacturing interests there, and, appreciating the fact that there is a large field for brickmaking machinery, brick being the most available building material in that country, he desires to obtain the agency for brickmaking machinery of all kinds—soft-mud, stiff-clay and dry-press—and will be pleased to correspond with manufacturers who can furnish working plans, blue prints, etc., of complete plants, so that they may be erected and the machinery installed in a proper and satisfactory manner. He will also be pleased to correspond with kiln and dryer builders. As it takes nearly a month for a letter to reach Johannesburg from the States, Mr. Wepfer suggests that those who write will do well to make their letters comprehensive, as at best it is difficult to transact business by correspondence where a letter is so long in reaching its destination. Our machinery men who desire foreign trade are respectively requested to take due notice and govern themselves accordingly.

HONORS FOR HERVEY HAIGH.

The Eastern Paving Brick Co., Catskill, N. Y., has named the latest addition to their fleet of brick barges the "Hervey Haigh," after their efficient superintendent. The new barge just built at Senator Rice's Rondout yard is the largest owned by the shale brick company, larger even than their coal barge, the "General Wiley." Mr. Haigh can now appreciate how it feels to have greatness thrust upon one, and can sympathize with Dewey and others whose names are thus handed down to posterity. The distinction is deserved, too, for Mr. Haigh, in making a success of continuous kilns at Catskill and other points, has accomplished what has baffled many able brick men. Here's to the "Hervey Haigh!" Long may she float.

CONVENTION ECHOES.

We have many times presented "convention echoes" to our readers which have told in varying keys and tones the pleasant recollections of our annual gatherings, each echo reflecting in a measure the pleasures and benefits derived by the members from the conventions. We have noticed with no little gratification that a wave of good fellowship invariably follows in the wake of the N. B. M. A. meetings, which of itself justifies the existence and assures the continuance of that organization, barring all other considerations.

It is now our pleasure to chronicle another echo, which is as significant as it is pleasing to those who read between the lines. Following the suggestion of Ex-President Eggers, the Columbus brickmakers now have "a little friendly understanding," following up the temporary organization entered into for the purpose of welcoming and entertaining the delegates to the National Convention by a permanent local organization, in which all the brickmakers of Columbus and vicinity are represented.

The harmonious trade conditions were fittingly celebrated on the evening of May 4 by a complimentary reception and banquet, tendered by William H. Fish, of the Fish Pressed Brick Company. The following unique menu and programme were enjoyed by a large number of brickmakers and their friends, the exercises extending over into the next day:

MENU.

SOUP. Contractors only in the Soup.

CUCUMBERS.
Green Burned.

RADISHES.
Cherry Red.

ONIONS.
Union Made.

FRESH FISH, LAKE BASS,
Caught by the Fish Brick Co.

SARATOGA POTATO CHIPS.
Chipped Bricks and Bats.

WATER CRESS,
From Hagerty's Yards.

PARSLEY,
From Mulby Yard.

NEW PEAS,
From Schmidt's Yards.

ASPARAGUS TIPS,
From Dow's Yard.

GIBLET PATTIES,
From Union Furnace Works.

FILLET OF BEEF,
From the Hanover Works.

TOMATOES BAKED,
From the Findlay Works.

NEW POTATOES IN CREAM.
From the Shawnee Works.

GREEN BEANS,
From Kulp's Yard.

BACON DICE,
From Ford's Yard.

BRICK ICE CREAM, with Terra Cotta Trimmings.

BRICK CAKES, { Roman, Octagon, Buff, Square, Chocolate, } For Brickmakers' Cake Walk.

CHEESE.
Stiff Mud Process.

CRACKERS,
Dry Process.

COFFEE,
Steamed Process.

HOSTER XX.,
Tempering Clay Pits.

BORN'S WIENER,
Tempering Colored Mortar.

CIGARS,
To take water smoke off.

MUSIC,
By the Hotel Dennison Orchestra.

PROGRAMME.

Address of Welcome by Mr. D. J. Clahane,
President of the Hanover Pressed Brick Co.
Response by Mr. D. C. Meehan,
Manager of the Columbus Face Brick Co.
TOASTMASTER, Mr. John D. Hagerty,
Secretary of the Brick Contractors' Association.

Paper on "Pressed Brick of the Past, Present and Future," by L. C. Kilbourne, President of the Columbus Brick and Terra Cotta Co.

Address on "Signs of the Times," by D. W. McGrath,
President of the Brick Contractors' Association.

Paper on "A Uniform Standard Size Brick," by Mr. G. A. Ford,
President of the Brickmakers' Protective Association.

Remarks on "The Great Need of Organization for the Protection of Labor and Capital," by Mr. J. F. Blair.

Banjo Solo and Song—"There is a Good Time Coming"..........Mr. S. J. Isabell.

Paper—Machine-Made Mortar..........Frank Pedrick

Song—"A Hot Time in the Old Town To-night"...Mr. F. M. Fornof.

Essay—The Colored Troops Fought Nobly..........Mr. I. A. Guren.

Oration—The Building of Solomon's Temple.......Mr. Wm. Watson.

Paper—Why all Chimneys Should Have a Round or Square Flue..........Wm. Justice.

Recitation—When Dewey Comes Marching Home Again..........Mr. C. E. Williams.

Song and Dance—"The Harbor Road".........Brick Yard Quartette.
Messrs. Dow, Mulby and Campbell.

Paper—Running a Lead, with a Hog in the Wall..........Mr. B. L. Stevenson.

Song—"Should Old Acquaintances be Forgotten..........Mr. Fred Fornof, Sr.

Paper—For the Improvement of Our Beautiful City..........Mr. Samuel Borger, Treasurer of the Hanover Brick Co.

Remark—It is not advisable to deliver brick from a kiln the day after you stop firing on the same, as it makes a hot time in the kiln, on the wagon and at the building..Mr. C. F. Harrison, Sec. of the Fish Brick Co.

Southside Brickyard Quartette.........The Pride of the Southside.
Messrs. Schmidt, Kulp and Wagner.

For cheap machinery the reader is referred to our For Sale Columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear machinery in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the "Wanted, For Sale, etc." columns a means of satisfying their needs.

TRADE LITERATURE.

We are indebted to Anthony Ittner, St. Louis, for a copy of his new catalogue of pressed, molded and ornamental brick. It is pocket size, with flexible covers, and contains illustrations of a large variety of special shape brick, and also a number of handsome brick mantels. Architects and contractors will find it a valuable handbook. A copy can be had by addressing Mr. Ittner direct. Ittner brick are standard. No better red brick are made anywhere, and many beautiful designs are shown.

The Cleveland Car Co., Cleveland, O., have favored us with a very handy memorandum book, which contains in a very small compass much valuable information. We presume a copy of it will be sent to any of our readers who write them for it, mentioning The Clay-Worker.

The Jeffrey Manufacturing Co., Columbus, O., have issued a new catalogue of electric and compressed air mining machinery, of which they make a large variety, especially designed and having remarkable capacity. Those of our readers who are interested in mining operations of any character should send for a copy, which can be had for the asking.

Leviathan, "It's a Brick," is the way the Main Belting Co., Philadelphia, Chicago and other points (see ad. on page 462), begin an interesting little booklet that is full of taking expressions and information about Leviathan belts, which those who have tried all kinds consider the best for brickyard use. The booklet will tell you all about it, and can be had for the asking.

THE CLAYS AND CLAY INDUSTRIES OF WESTERN PENNSYLVANIA.

The above is the title of a recent publication of the School of Mines of the Pennsylvania State College, prepared by Mr. T. C. Hopkins. It includes a description of all the clay deposits and the clay manufactories in Allegheny, Fayette and Westmoreland counties, and parts of Green, Washington, Beaver, Armstrong, Indiana and Cambria counties—that is, the river valley areas surrounding Pittsburg, except the upper part of the Allegheny river valley above Kittanning.

The report contains 182 pages, and is well illustrated with maps, geological sections, views of the clay deposits and the methods of manufacture. Many of the illustrations have appeared in previous issues of The Clay-Worker. A portion of the text, revised by the author, with some new illustrations, are given on preceding pages.

The book is carefully indexed, and will prove a valuable addition to the Keystone State's technical literature. The college is to be commended for carrying on this much-needed work, as reliable information concerning the different resources of the State is sought after both by the tradesman and the general reading public, and in this respect the college supplies in part, at least, the lack of a State geological survey. Mr. Hopkins, having served as assistant State geologist on two different State geological surveys before coming here, is eminently fitted for the work.

Parties desiring copies of the clay report may obtain it by addressing Prof. M. C. Ihlseng, State College, Pa., and sending ten cents to pay the postage.

SCORIA BRICK.

Bricks made from the waste slag of iron furnaces reappear as regularly as our old friend the sea serpent. They usually are in season at the same time as slag cement, and go out with the latter. The following extract from the *Marine Record* of Cleveland, bearing on the impracticability of making a sound cement from such material, is equally applicable to slag brick. The destructive elements in the one are identical with those in the other:

"Engineers are, of course, aware that slag cements have been brought forward again and again during the last forty or fifty years, only to be as often withdrawn. Cements of this class are essentially hydraulic, but that is their chief, if not only, virtue. There are several different kinds of furnace cinders available for cement making, but, as our readers are only concerned with that obtained from the iron blast furnaces of the United States, our remarks will apply more particularly to the average of such slags.

"The objections to these slags for cement making may be summarized thus: Irregularity of composition; variation of temperature at which they are chilled; an amount of caustic lime usually produced by the heat at which the chilled slag is dried; and, above all, they contain 2 to 2½ per cent. of sulphur, which, unless the cement is kept entirely under water, will inevitably destroy it in course of time. Others might be mentioned, but the foregoing will suffice.

"Apropos of these it is grimly amusing to hear how placidly the advocates of slag cements, possessing all or most of the drawbacks above enumerated, recommend their use for foundation work. An ordinary individual would probably think that the foundation of a building or bridge pier was about the last place to introduce a material of more than doubtful reputation. 'But,' say some of them, 'we get rid of the sulphur.' A little inquiry, however, elicits the fact that they get rid of it by dumping it on their customers, and we cannot see any other way.

"The invention, which we suggested as being applicable to slag, can never make a slag cement, but it evidently can be applied so as to make, with slag as a basis, a mortar closely resembling Portland cement mortar, in which case all the objections referred to will be so minimized as to be harmless.

"The conclusion seems to be that our waste iron furnace slag is not an available source of reliable cement; that with the sulphur so diluted, as proposed in the invention referred to, a good hydraulic mortar closely resembling Portland cement mortar may be produced; that the manufacture of the latter may be profitably undertaken if it can be sold at about two-thirds the cost of Portland cement, and this is often very difficult, though not impossible. It would be well for our readers to regard all slag cement enterprises with caution."

These slag brick are all right to look at, but they are like wooden nutmegs—"made to sell." The presence of sulphur in excess is easily detected by the patches of deep blue or blue green coloring, and, if such a brick be broken, much of the discoloration will be found in it. If a small piece be rubbed smartly in the hand, or on a cloth for a few moments, the odor of sulphur is distinctly apparent. This is not, as some of our contemporaries seem to think, either a new industry or one deserving of any encouragement. H. J. L.

SOME ALLEGED HUMOR.

"Talk about bats," said the man who had traveled, "I never saw so many bats in all my life as we ran across while exploring that cave down in Kentucky."

"Lots of them, eh?" queried the man who hadn't traveled much.

"Lots of them! Well, I should say. Why, in one of the chambers it was all we could do to force our way through."

"Oh, that is nothing great," said the man who had never traveled. "You want to go down to Barclay's brickyard. Bats so thick down there they pushed Barclay through."

"Pushed him through what?" asked the muchly traveled man.

"Through bankruptcy," answered the m. w. h. n. t., and the m. w. h. t. promptly had a fit.

* * *

Bric: "Ever noticed how much alike a dude and a brick setter are?"

Brac: "No; never saw any resemblance. Where'd you get the idea that they were alike?"

Bric: "Simply from the fact that they both get themselves up to kiln."

Written for THE CLAY-WORKER.

THE SONGS OF THE BRICKYARD.

Do you remember the songs that you heard in the time of your youth, long ago,
In the brickmakers' theater back of the hill that was lit by the kiln-fire's glow,
When you were a lad and you met with the men who had toiled in the mud through the day,
As they sat with the burners at evening to sing as a salve for the pains of the day?

And do you remember the thrills of delight that shot thro' your innocent heart
When the first fluffy cloud showed itself on the hill, and the kiln fire you knew was astart?
How joyous and eager, when supper was done, you had hastened away to the kiln
To listen again to the rapturous strains that arose on the evening still?

And the yard—you remember how restful it looked, when the work of the day had been done;
And the long, level rows on the smooth-trodden flat, and the hacks in the evening's sun.
A halo of glory hung o'er the machines and a sunburst abroad on the bank;
No theater grand nor a fairy domain equaled this from the sun as it sank.

And then, you remember, the darkness stole down from the black woods beyond on the hill,
And the tall shadow ghouls stalked along on the bank, kept at bay by the light of the kiln;
And the frog band began its mellifluous strain to the fairies who danced by the stream.
It was then the full flood of your pleasure began, and you lived in an ecstatic dream.

For 'twas then that the men sang of homes far away and of loved ones they never might see,
And of good days gone by and contentment and joy, and of heroes who sought to be free,
And of maidens whose hearts were as pure as the snows, and whose loves were as pure as the sun,
And who waited in vain for the happy return of their heroes whose fighting was done;

And of "Bonny Blue Bells" and of "Silvery Tides," and of "Raging Seas" lovers had passed;
And of sweet maids whose parents were cruel and proud, but whose loves were triumphant at last;
Of sad souls who sighed for the ones they loved best, who had married the man of their hate;
Of the sorrowful graves of the handsome and brave, stricken down by an envious fate.

And they sang the brave songs of your dear native land, of its heroes on land and on sea;
Of the blood that was shed and the tyrants who fled when Columbia spoke to be free;
Of the "Red, White and Blue" and the "Cumberland's Crew," of brave Hull and the vict'ry he won;
Of the march to the sea, and how Johnny came home when the last of the fighting was done.

And your heart, how it leaped when "Our flag was still there," and oh, the wild throb that it gave
When the echoing woods carried on the refrain, "The home of the free and the brave.
The arches burned low. Some one sang, soft and low, in the dim of the fast fading light,
One song for the old Kentucky home, "My old Kentucky home, good night."

Oh, of course you remember these songs that were sung, and the half-suppressed sighs at the close,
And the voices subdued as they spoke the good night ere the day toilers sought their repose.
You have heard since that time grandest operas, stars with their music set palaces ringing,
But nothing can equal the concerts you heard by the kiln when the mudlarks were singing.

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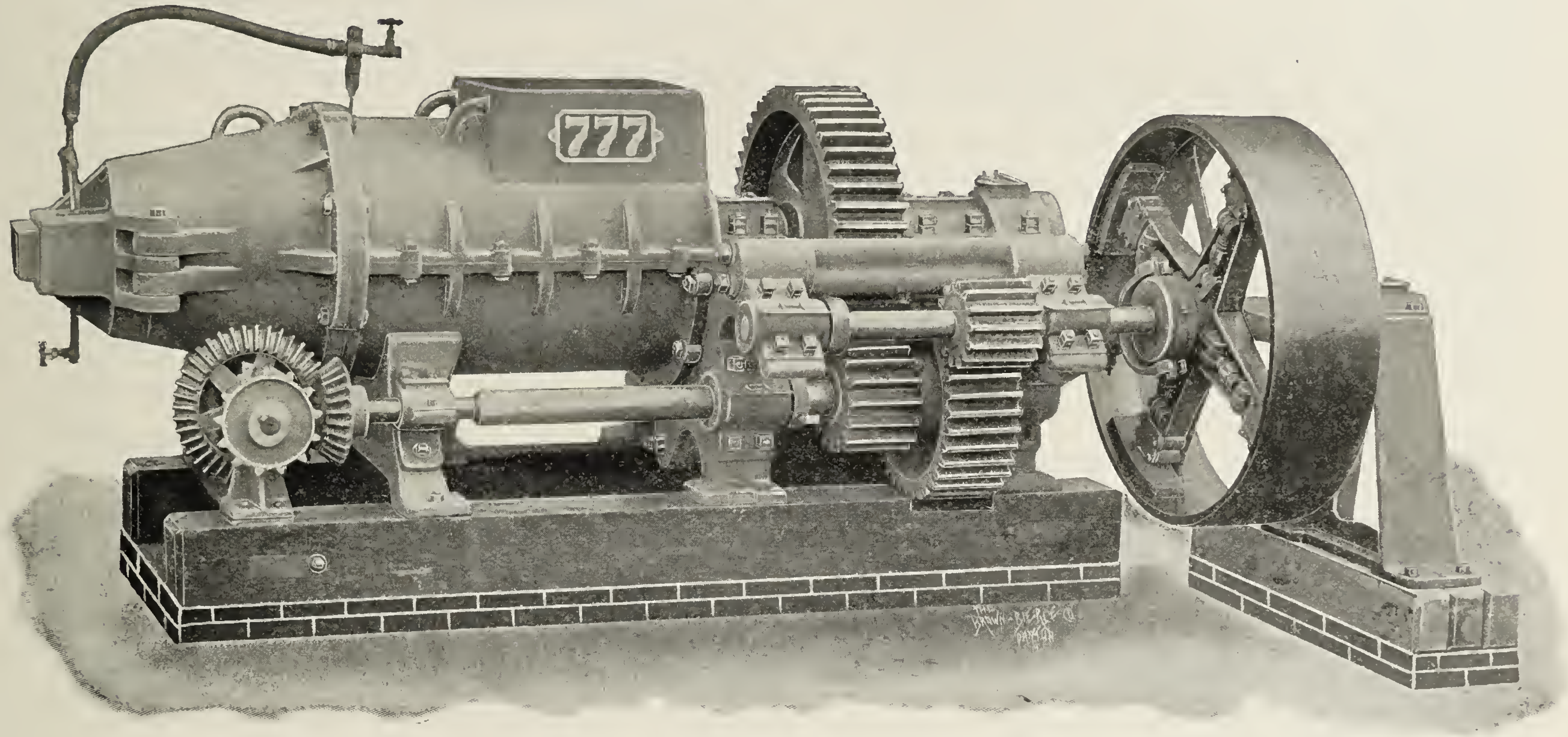
Books for...
Brickmakers.

"CLAY GLAZES AND ENAMELS," Henry R. Griffen, C. E. $ 5.00
"BRICKMAKER'S MANUAL," Morrison and Reep, 3.00
"BRICKMAKING AND BURNING," J. W. Crary, Sr., 2.50
"TABLE OF ANALYSES OF CLAYS," Alfred Crossley, 1.00
"VITRIFIED PAVING BRICK," H. A. Wheeler, E. M., 1.00
"PRACTICAL FARM DRAINAGE," J. J. W. Billingsley, 1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

Beautiful Homes
ARE BUILT WITH
Beautiful Brick
MADE BY
Beautiful Machinery.

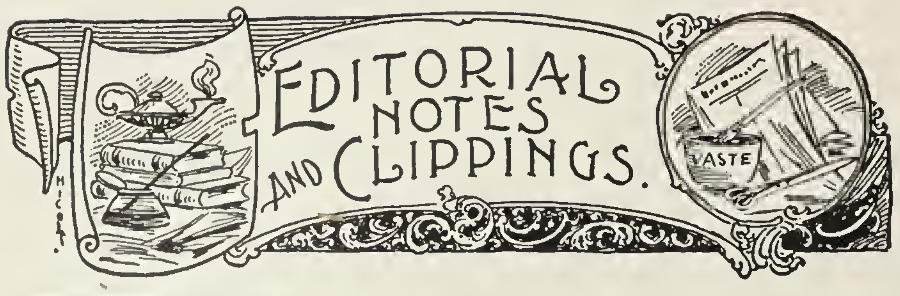


777 BRICK MACHINE.

RAYMOND'S BRICK MACHINERY

Leads all others for high character of its construction,
Greatest producing power, Most perfect product.
All Raymond Brick Machines ever sold are in daily use. Unimpeachable testimony from manufacturers of highest standing.
Our 1899 Catalogue, just out, upon application.

C. W. RAYMOND & CO., Dayton, Ohio.



EDITORIAL NOTES AND CLIPPINGS.

A. W. Leonard will manufacture tile at Terre Haute, O.

H. W. Brown will operate the brickyard at Champlain, Vt.

Visalia, Cal., is to have a brickyard of 20,000 daily capacity.

T. N. Scott, of Petersburg, will open up a brickyard at Lewisburg, Tenn.

Mr. Kinsey, of Tullahoma, Tenn., will open up a brickyard at Lynchburg.

The entire plant of the Malvern (O.) Clay Co. was destroyed by fire, May 6.

The Great American Brick Co. will open up a brickyard at Cripple Creek, Col.

Shafer Bros., of Urbana, O., will soon open up a brick plant at Bellefontaine, O.

At Atlantic City, N. J., they are paving streets with white pressed paving brick.

George Buck, of Morris, Ill., contemplates establishing a plant at Williams, Ia.

Hunsey & McFayden have leased the Rosenthal brick plant at West Branch, Mich.

J. J. Nix has purchased the plant of the Alabama Pottery Co. at Fort Payne, Ala.

The tile factory of L. O. Fultz, Jeffersonville, O., was badly damaged by fire recently.

Mr. Miller has purchased a site at La Farge, Wis., on which he will erect a brick plant.

H. Sonitz, of East Palestine, O., will, in all probability, erect a pottery at Tiffin, O.

Arthur O'Donnell is making arrangements to start a large brick plant at Camp Run, Pa.

The brickyard of John Leytham at Neola, Ia., has been purchased by William Schierbrock.

Aberdeen, Minn., is to have a new brick plant. Louis Lager is at the head of the enterprise.

Grier & O'Connor will establish a new yard at Priceburg, Pa., for the manufacture of brick.

Walter Rand, of Smithfield, N. C., writes that he is putting in a new brick plant at that place.

The Vinton Brick and Tile Co. has been incorporated at El Paso, Tex., with $20,000 capital stock.

The Lorain (O.) Shale Brick Co. has recently been incorporated with a capitalization of $50,000.

Geo. Goodwin suffered a slight loss by fire at his brick plant, recently, in Nicetown Lane, Philadelphia, Pa.

N. P. McPherson, of West Point, Ga., has moved to La Grange, same State, where he will manufacture brick.

Jno. R. Clay and Jno. McGraw are at the head of a movement to establish a pressed brick factory at Terrell, Tex.

Lafayette Jones has established a brick plant at West Point, Ga. It is his intention to manufacture tile as well as brick.

Shafer Brothers, of Urbana, O., have purchased a tract of land at Bellefontaine, O., where they will erect a brick plant.

J. W. Kepler has purchased a site at Humeston, Ia., and will erect a brick plant, putting in new machinery and appliances.

W. T. Ball has sold the Argillo tile works at Carbon Cliffs, Ill., to Fred Titterington and J. F. Robinson, of Rock Island.

George Partridge has sold his brick plant at Cando, N. Dak., and will build a new one either at Fargo or Moorehead, that State.

Frost's brick works at Ferry's Landing, a short distance below Mount Vernon, Va., was completely destroyed by fire recently.

The three brick manufacturers of Northampton, Mass., have entered into a combination or compact to protect their mutual interests and reduce the expense of marketing their product. They say it is not in any sense a trust, as there is no intention of advancing prices. All collections and sales will be made through their agent, J. W. O'Brien. The firms interested are W. A. Bailey, Matthews & Gleason and Day Bros.

The George H. Clippert & Bro. Brick Co. have filed articles of association at Detroit. The capital stock is $50,000, all paid in.

C. E. Dean and J. E. Wickham have leased the old Miller brickyard at Glenwood, Ia., and are getting ready to manufacture brick.

All three plants of the Indiana Brick Co. at Anderson, Ind., are running full-handed, and the company is still far behind with orders.

The Cambridge Tile Manufacturing Co., of Covington, Ky., will build an addition to their plant, thus greatly increasing the capacity.

The Asheville (N. C.) Brick and Tile Company has been chartered. Lewis Maddux, H. Parker and Lewis M. Bourne are interested.

The Oak Hill Fire Brick Co. will build an addition to their plant at Oak Hill, O., in order to meet the increased demand for their product.

The brick plant of A. S. Cunningham at Indiana, Pa., will be equipped with entirely new machinery and made a modern plant throughout.

J. M. Stevens is at the head of a movement looking toward the organization of a company to manufacture brick at Sherman Heights, Tenn.

Thos. P. Lynch, of the firm of Lynch Bros., brick manufacturers, of Holyoke, Mass., died in that city May 3. He leaves a widow and two children.

The Continental Brick Co., of St. Louis, Mo., has been incorporated by F. D. Woodlock, D. A. Marks, G. H. Petring and others. Capital stock, $75,000.

Samuel Holyoke has leased the brick plant at Brewer, Me., formerly operated by the late A. H. Gould, and will run the same in connection with his old yard.

D. L. McKinnon, of Detroit, Mich., has leased the Anna River brick plant, a short distance from Munising, and will operate same to the full capacity this season.

The Marietta (O.) Brick and Tile Co. are so busy meeting the demand for their product that they are putting in incandescent lights, and will run a night force.

The South McAlester (Indian Territory) Pressed Brick Co. has been organized. They will erect a plant and begin the manufacture of machine-made brick at once.

Wm. Ashton, an employe of the Cleveland Brick Company, Canton, O., was so badly injured by the caving in of a clay bank that he died a few hours after the accident.

The new pottery at Coffeyville, Kan., has just completed the first burn and made their first shipment of pottery. All of the pieces came from the kiln in remarkably good shape.

The plant and land of the Maryland Brick Company, at Baltimore, Md., have been sold by the receivers to Horace Slingluff for $70,000, subject to ratification by the court.

The City Brick Co. at Shakopee, Minn., is undergoing extensive improvements, and new machinery and apparatus is being put in preparatory to starting for the season's run.

A. J. Daniels, of Bicknell, Ind., is organizing a company for the manufacture of brick at Owensboro, Ky. J. H. Parish, of Owensboro, Ky., is one of the prime movers in the affair.

I. D. Heinrichson, of Cincinnati, contemplates establishing a pottery at Lake Charles, La. He thinks that the clay in that vicinity is well adapted to the manufacture of fine pottery.

S. A. Gilmore is making a number of improvements at his brick plant in Westborough, Mass. Among other things he is building new kiln sheds to replace those burned some time ago.

Brown & Hudson, brick manufacturers of Mooresville, N. C., have purchased land at Statesville, on which they will establish a brick plant. They will move their entire equipment from Mooresville.

Chas. Ford, a brick manufacturer of Washington, D. C., died at his home, near North East, Md., aged seventy-one years. He had been in the brick business since 1858, and had acquired quite a fortune.

Horace Purinton, of Waterville, Me., reports a very satisfactory trade. He will run all four of his yards this season to their full capacity. Mr. Purinton began business twenty-two years ago with a small yard in Waterville, Me., and now he

CONTINUED ON PAGE 458.

The "Monarch" BRICK.... MACHINE,

Unquestionably the

Leading Horizontal "Soft=Mud" Machine.

More in use than other of its class.

◆

The

"Iron Quaker" Brick Machine

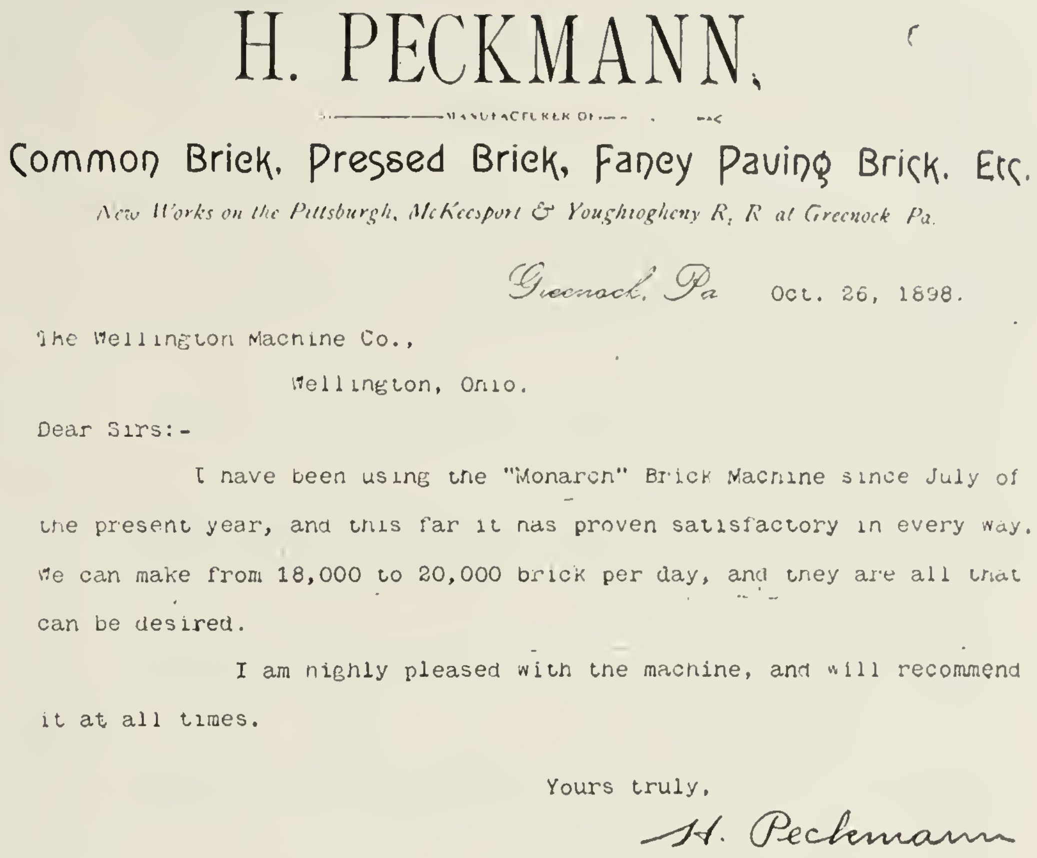
Unquestionably the

Leading Upright "Soft=Mud Machine.

Horse and Steam Power.

More "Quaker" Machines in use than any of its class.

HERE'S ANOTHER GOOD ONE.



H. PECKMANN,
MANUFACTURER OF
Common Brick, Pressed Brick, Fancy Paving Brick, Etc.
New Works on the Pittsburgh, McKeesport & Youghiogheny R. R. at Greenock Pa.

Greenock, Pa Oct. 26, 1898.

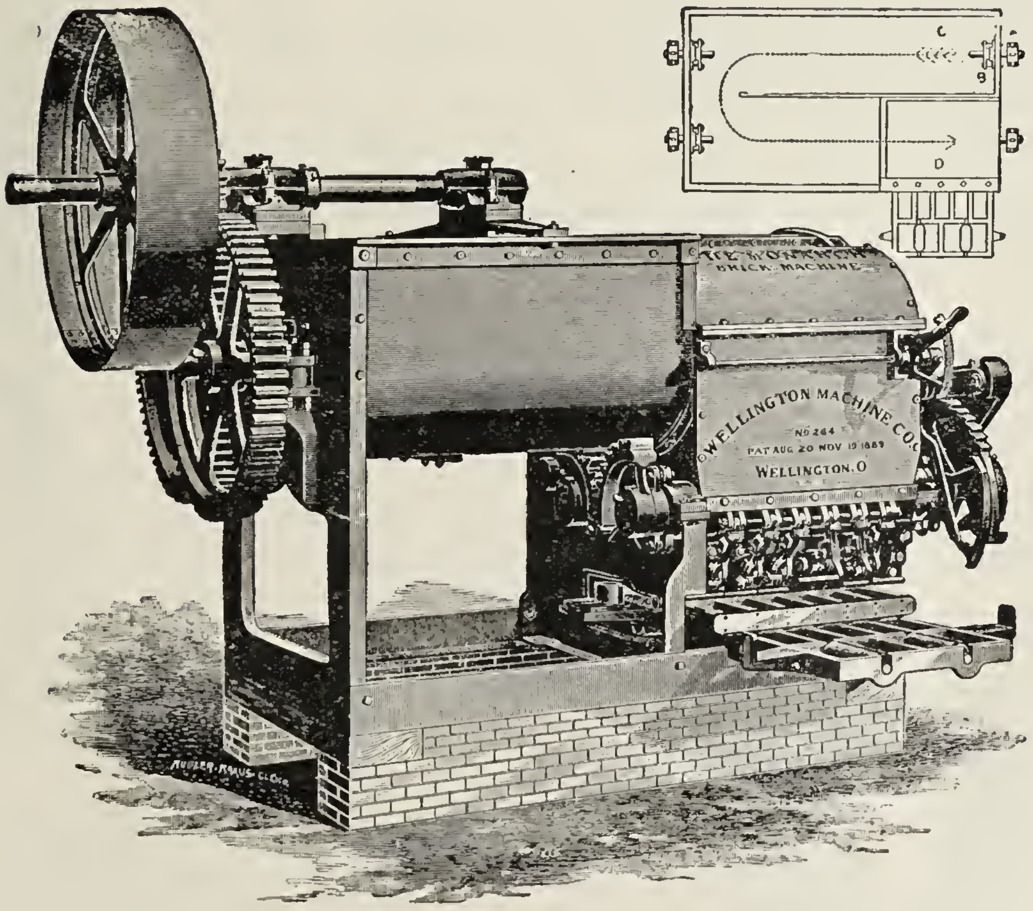
The Wellington Machine Co.,
Wellington, Ohio.

Dear Sirs:-

I have been using the "Monarch" Brick Machine since July of the present year, and this far it has proven satisfactory in every way. We can make from 18,000 to 20,000 brick per day, and they are all that can be desired.

I am highly pleased with the machine, and will recommend it at all times.

Yours truly,
H. Peckmann



We have the Best and Lowest Priced

Mold=Sander.

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No one else makes . . . .

BALL-BEARING TRUCKS and BARROWS.

The Greatest Improvement in small articles ever put upon a brickyard.

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ALL OTHER AUXILIARY TOOLS, MACHINES AND SUPPLIES.

The Wellington Machine Co.,

Send for Circular. Mention the Clay-Worker ***WELLINGTON, OHIO.***

EDITORIAL NOTES AND CLIPPINGS—Continued.

operates that one, considerably changed, one at Bangor, one at Augusta and one at Mechanic Falls. He has sold almost his entire product for this year.

The Frost Brick Company's plant, at Dodge Creek, Fairfax county, Virginia, was entirely destroyed by fire the morning of the 2d inst. The loss is about $15,000.

The Moore Brick Manufacturing Co. has been incorporated by M. Moore, J. Conduit Smith and John M. Mills, with $75,000 capital stock. The works will be located at Whippany, N. J.

Cuno Kibele will operate the brick plant at Bluffton, Ind., to its full capacity. He has had the kilns piped for gas, and made other improvements for turning out a good grade of brick.

W. L. Baldridge, Manager of the Portage Brick Company, Hollidaysburg, Pa., writes that his company wants to purchase a good second-hand boiler and engine of fifty to sixty horse power.

The death of Wm. P. Graul, the well-known brick manufacturer, of Reading, Pa., occurred in that city recently, brought on by nervous prostration. Mr. Graul had been in the brick business seventeen years.

The partnership existing between P. F. Welch and John N. Cahill, under the name of the Turners Falls Brick Co., has been dissolved. The business will be continued under the same name by Mr. Welch.

The Allentown (Pa.) Paving and Construction Company is making experiments with clay and shale at Hickory Run, Pa. Should the tests prove successful, a plant of 20,000 to 30,000 daily capacity will be put up.

Cranor's Red Brick Company's plant, at Daleville, Ind., was seriously damaged by fire recently. All of the machinery, with one shed and ten thousand pallets, was destroyed. The burned portion will be rebuilt at once.

The New York Brick and Paving Co., Syracuse, N. Y., started up at full capacity the first of the month. They have been idle for some time, during which the plant has been equipped with new machinery.

The Best Brick Company, at Mechanicsville, N. Y., has the $20,000 addition to its plant about completed. This, in connection with its other plants, will enable the company to turn out close to 100,000 brick daily.

S. J. Plant writes that he is putting in a brick plant at Kunkletown, Pa., for the New York and Pennsylvania Brick, Tile and Terra Cotta Company, and is fitting up the plant with down-draft kilns of his own patent.

The New York Ornamental Brick Company, of Bayonne, N. J., has been incorporated to manufacture brick. The incorporators are H. R. Frey, L. L. Wright and Frederick Wiener. They have a capital stock of $25,000.

Geo. A. Stewart is making a number of improvements at his brick plant at Madisonville, Ky., in order to increase his capacity. He anticipates a large demand this season. He is building a new kiln that will hold 250,000.

T. E. Dickinson, of Kendallville, Ind., contemplates establishing a large brick plant at Manitowoc, Wis. He has made tests of the clay, producing brick of rich cream color. The plant will have a capacity of 100,000 brick a day.

W. Butler and J. Julius, two enterprising citizens of Lead, S. Dak., will establish a brick manufactory in that town. There is a good demand for brick in that vicinity, and heretofore brick have been brought in from outside towns.

The Knoxville (Tenn.) Brick Company's plant, which has been idle for some months, has resumed operations. It has orders ahead that will keep the plant going all summer. All the brick plants are running to their full capacity.

The use of hollow building brick in Detroit seems to be constantly on the increase, and Chambers Bros. Co., Philadelphia, have just shipped a complete outfit of their hollow brick making machinery to the F. H. Wolf Brick Co., of Detroit.

With the opening of the Haverstraw, N. Y., yards came the annual strike, brought about through a difference of opinion as to the number of brick to be made per day. An agreement has been reached, the bosses having acceded to the demands of the men, and 22,000 for each machine will henceforth be the number turned out.

Perry, Ia., wants a first-class brick and tile plant. They offer cheap coal, pure artesian water and unexcelled railroad facilities. Samuel Carrell, secretary Perry Improvement Association, says they will spend this year over half a million dollars in private and public improvements. Parties interested should address Mr. Carrell at once.

The Ogden brick plant, at Binghamton, N. Y., has not started up yet, owing to a number of improvements being under way. They expect to be ready for operation by June 1.

Dow City, Iowa, wants a good brick plant, M. G. Wiggins, postmaster of that thriving town says there is a good demand for brick and that if a good man will establish a plant there he can make it a paying investment.

The Maritime Clay Works has been chartered to manufacture brick at Pugwash, Nova Scotia, where a fine deposit of clay has been discovered suitable for fine brick and terra cotta. A plant of 60,000 daily capacity will be erected at once.

John Heim, who now has a well-established plant at Dubuque, Ia., will erect a plant at Sinsinawa Mound, a suburb of the former place, where he will make 1,500,000 brick to fill an order for buildings to be erected at Sinsinawa Mound this summer.

With a view of meeting the increased demand for brick, the Decatur (Ill.) Brick Company will put in a Freese side-cut machine at their No. 1 plant. As soon as this machine is installed and running smoothly they will put in a similar machine at their No. 2 plant.

Merry Bros. have leased the entire brickmaking plant of Hankinson & O'Keefe at North Augusta, Ga. The demand for brick in that section is good, so that the plant will be operated to its full capacity. The new firm will be known as the Savannah Valley Brick Co.

John Hedgecock, the well-known brick manufacturer of Pulaski, Va., has begun the erection of a new plant at Hiltons, Va. As soon as the same is completed he will move the plant from Pulaski to the latter place, adding new machinery and making it up to date in every way.

J. B. Pierce, who for a number of years has been connected with Pierce & Giles, brick manufacturers of Peoria, Ill., has severed his connection with that firm, and embarked in the business on his own account. Mr. Pierce is a practical brickmaker, and there is no doubt as to his success.

The plant of the Lookout Steam Sewer Pipe Co., Chattanooga, Tenn., which has been shut down for some time, was almost completely destroyed by fire recently, the office alone escaping damage. The fire is supposed to have been the work of incendiaries. Loss on the works is estimated at $50,000. The plant was owned by Montague & Co.

The brick plants at Berlin, Conn., while about two weeks late in starting, are now running full handed. The C. P. Merwin Company is making a number of improvements at its plant. The company is laying a system of track from bank to machine shed for the transportation of clay, thus doing away with the horse and cart method.

Many of the clayworking establisments throughout the country have voluntarily increased their employes' wages from 10 to 25 per cent. Among the number are the Massillon (O.) Stone and Fire Brick Co.; Kentucky Fire Brick Co., Fire Brick, Ky.; James Gardner Fire Brick Works at Ellerslie, Md.; Williams & Burchinal, Uniontown, Pa.

The Witch Hazel Coal Co., Youngstown, O., has purchased the plant of the Ravenna (O.) Brick and Tile Co. No change will be made in the management of the concern, except that the offices will be moved to Youngstown. The Witch Hazel Company will enlarge the plant, so as to increase the capacity to meet the growing demand in that vicinity for their product.

The works of the Sheridan Brick Co., Sheridan, Ind., were badly wrecked at 4 a. m., May 13, by the explosion of the boiler. The night engineer was so badly scalded that he is not expected to recover. The damage to the plant is estimated at $8,000. Cause unknown, but it is surmised to have been the result of insufficient water in the boiler. It is the second time the plant has suffered from the same cause.

In a recent letter Elder & Dunlap, of Bloomington, Ill., manufacturers of the Perfect Clay Screen, say they are quite busy, having booked a number of orders recently. Among those received lately are the following: Tennessee Paving Brick Company, Chattanooga, Tenn.; Atlas Press Brick Works, Ferris, Tex.; San Antonio (Tex.) Sewer Pipe Company; McAvoy Vitrified Brick Company, Philadelphia, Pa.; St. Louis (Mo.) Pressed Brick Company, and Evans & Howard, of St. Louis. The two latter firms have ordered two screens, one screen for Evans & Howard being the largest size.

An Object Lesson.

OLD THINGS are always very interesting to look at, but otherwise are of little value. As a relic of by-gone days the old lantern with its tallow dip is an object of interest but as a thing of utility it long since gave way to something better. The brickmaker who clings to the antiquated methods of his forefathers is, if he only knew it, as much out of date as the old town Crier with his bell and candle.

Brickmakers who keep up with the precession must use improved methods and appliances which enable them to make more and better brick with less labor and loss. Those making soft mud or tempered clay brick, and they are decidedly in the majority, are invited to investigate

The Mock Method

of handling brick by which those making 20,000 a day or more can handle them from machine to kiln much better, cheaper and quicker than by old methods. **The Mock Patent Rack and Pallet System** is now being used by many brickmakers, who pronounce it the **cheapest** and **best** system yet invented—with it boys can do the work of men. We will gladly send illustrated circulars telling all about it to those who are interested.

J. F. MOCK & CO.,
Hartford City, Ind.

We also manufacture an Improved Stock Brick Machine of large capacity very strong and durable. Also a full line of Brick Trucks, Molds, Kiln Castings, etc.

PACIFIC COAST NEWS.

SINCE THE RAINS reported last month there has been a general revival in all the building trades here. It has rained more this month, and now every one is confident of a good year. This revival has been felt, to some extent, in the brick, tile and pottery trades, though, of course, the great bulk of the benefits is still in the future. Architects and contractors report a number of large buildings in prospect, and some contracts have already been let, notably for the new six-story Crocker building on Post street.

Henry Cowell & Co., San Francisco, Cal., report a fair trade in fire brick. The outlook for this class of goods on the coast is unusually good.

The California Pottery Co., San Francisco, Cal., are pleased with the state of trade in their line. Prices are steady, and permit of a fair margin of profit. They are expecting some large contracts shortly.

Bush & Mallet, San Francisco, Cal., say that the number of building contracts already let warrant the assumption that the tile trade for this season will be the best in years. Since the rain everything has brightened up remarkably in their business.

The Sacramento (Cal.) Brick Co. have just finished laying the foundation of the Crocker building. They report that the prices of brick have never before been so low in this city, some sales having been made for $5.50 per thousand. The ruling prices for building brick are from $6.50 to $7, while pressed brick are selling at $30 per thousand. The prospects ahead are good, there being more work in sight than for a long time. They find, however, that the supply in this market more than equals the demand.

The California Anti-Caloric Co., San Francisco, find business remarkably good in their anti-caloric pipe coverings. They expect to enter the fire brick market here shortly, and put on the market a first-class fire brick which they can sell much below ruling prices.

Holt & Gregg are making extensive improvements in and around their brickyard, between Redding and Anderson, Cal. New brick machines are being made for the firm by H. W. Carr, of the Redding foundry, and the brick manufacturing plant will be run by steam hereafter.

The West Kootenay Brick and Lime Company, at Nelson, B. C., has completed its organization by electing officers. W. W. Beer has been made president and chairman of the Board of Directors, and T. G. Proctor managing director and secretary and treasurer. In addition to the above the directorate is made up of W. H. Downing, H. G. Neelands and V. A. Macdonald. The company will commence the manufacture of brick this month, operating two yards in Nelson and one in Balfour, B. C.

The Portland Clay Company's brickyards at Fulton, Ore., started operations last month, after having been shut down on account of a lack of demand for their product. With this year came a renewed demand for brick, and the entire stock on hand—more than 1,000,000 brick—was disposed of at good prices. The machinery has a capacity of about 23,000 brick per day. The company has a whole mountain of excellent clay, which will last indefinitely.

The Weston, Ore., brickyard has commenced work with three yard crews. On account of prospective building at Pendleton, Ore., and Walla Walla, Wash., and the brick famine at Walla Walla, the Weston yard will be kept busy throughout the season. From three to four million brick will be manufactured.

The McGill Brick and Coal Company is a new organization for promoting enterprise in Republic, Wash. Its members are Miles McGill and W. C. Morris, and its object the manufacture and sale of brick, charcoal, etc. Brickmaking has been commenced, and samples of the product show an excellent quality.

P. Withycombe, the North Yamhill, Ore., tile dealer, has recently sold four carloads of tile to parties at Albany, Ore., and is making prepartations for a big run this season.

John H. Carter, Hawaiian consul at Seattle, Wash., has received a communication from the Hawaiian consul general, asking him to invite brick dealers in his territory to bid for work on the new sewerage system to be constructed in Honolulu. The brick wanted are 82,000 delivered not later than July 1, 80,000 delivered not later than July 15, 80,000 delivered not later than August 1, 80,000 delivered not later than September 1, 37,000 per month thereafter for four months. Fire brick and fire clay are also wanted.

The work of manufacturing brick at The Dalles, Ore., will begin as soon as the weather settles, as it is necessary to furnish about 500,000 for the new wing to be added to the asylum. About 1,000,000 will probably be made this season.

Besides the large contract to furnish terra cotta for the new custom house at Portland, Ore., the Lincoln, Cal., pottery has two orders for terra cotta to be used in another building in the same city, and also for a building in Honolulu. As a result of these orders a rush is on in the drafting room at the pottery, and a good-sized force is busy turning out designs for the work. Later on the other departments in the terra cotta manufactory will be started up. At present the work is confined to the draftsmen.

Assayer Lynch has had in operation recently an assaying furnace made from the stone which comes from Metcalfe's quarry, west of Kingman, Ariz. It is a natural fire brick, and demonstrated that it could stand the immense degree of heat developed by the assayer's gasoline blowpipe. The stone may be valuable as lining for fire boxes, smelting furnaces, etc.

The copartnership known as the Stockton Brick and Terra Cotta Company, of Stockton, Cal., composed of John J. Moule and August Kunze, has been dissolved. John J. Moule will continue the business.

The Washington Brick and Lime Company, of Spokane, Wash., is completing a series of improvements to its plants at Clayton and at Springdale, Wash. Latest patterns of machines for manufacturing pressed brick have been installed, and both plants are now running at full capacity.

SUNSET.

Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

AN UNEXPECTED VENGEANCE HARVEST.

PAT—"Here's where Oi gits aven wid McSweeny fer the lickin' he gev me.——

——Oi'll yank the laddher from under him an' give him a bad fall, begob!" (Swish!——

——biff! bang! thud! Tableau.)

Anglo-American Pottery.

Old English China with American Views.

A MANUAL FOR COLLECTORS, BY

DR. EDWIN ATLEE BARBER, A. M., Ph. D.

Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc.

The book consists of about 170 pages, illustrated with 93 half-tone engravings of old plates and pitchers bearing American designs, produced by English potters between 1815 and 1840, and sketches of each English Potter. Over 500 different designs, in dark blue and other antique china are listed. The work will prove of great interest to all lovers of old crockery in America and England and will be especially valuable to collectors.

The price is $1.60 per copy, postage prepaid.

T. A. RANDALL & CO.,
The Clay-Worker.
INDIANAPOLIS, IND.

FOR SALE.

Two Penfield Brick Machines with Pug Mill—all iron—six moulds.

One Simpson Dry Press Machine.

These machines are in good order and can be seen at our Ruchs Hill Brickyard, Pittsburg, Pa.

We will gladly answer all communications regarding the sale of same.

BOOTH & FLINN, Limited,
PITTSBURG, PENN.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED—A good man who knows how to make and burn dry press brick. An experienced and reliable man will be given superintendency of plant at good wages. References required. Address
5 1 x P. D. Q., care Clay-Worker.

FOR SALE—Three Eagle Represses, as good as new; scarcely used at all, owing to change of process, making repressing unnecessary. They are the latest improved design and will be sold at a bargain. Address BUSY BOY, care Clay-Worker.
5 y d

FOR SALE—A Ross Keller tripple pressure 6-mold, dry-press brick machine, capacity 35,000 per day, used only 90 days, in first-class condition; one revolving dirt screening machine; 15 tons of 4-ft. grate bars; belting, shafting and pulley wheels; 2 iron tanks, 7 ft. by 10 ft.
GEO MATHERS, 960 Nassau st.,
5 3 dm. Cincinnati, O.

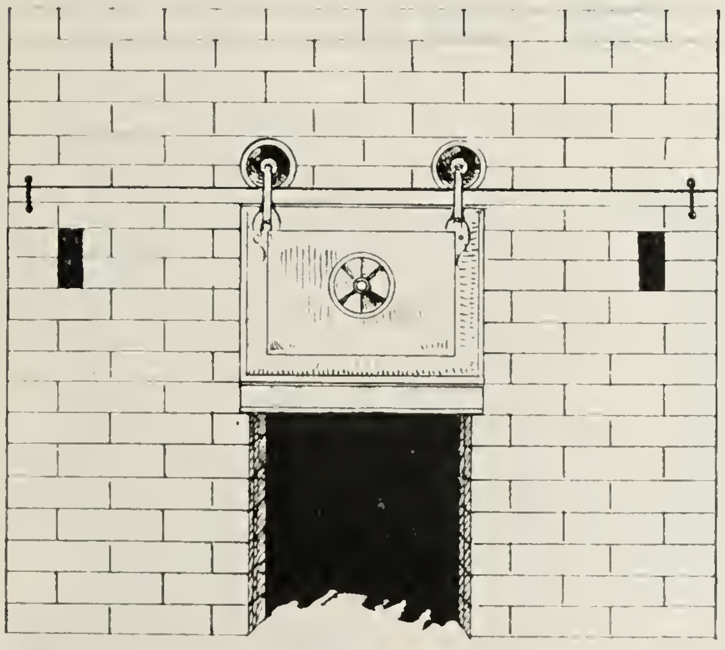
ABBEYVILLE, GA., BRICK PLANT FOR SALE

Belonged to the estate of Geo. W. Reed and consists of one 40 horse power engine and boiler, one Raymond improved machine with pug mill attachment. Track to clay bed of 32 lb rail, wheel barrows and buggies and all fixtures ready to start. It has a capacity of 24 M per diem. Good labor 75 cents a day, wood delivered on yard $1.25 per cord, on railroad with switch to kiln. Plenty of good clay at $60 per year. Demand for output at from $4.50 to $5.00 per M. on cars. Good community. Price $1,800.
Address, A. K. FISHER, Abbeyville, Ga.,
5 1 cm] or, J. E. ADAMS, Franklin, Pa.

FOR SALE.

Two Adrian stiff-clay brick machines. $200; 1 stiff-clay pug mill, friction pulley, $150—all used six months, cost $1,600; 1 new Morince curve, side-cut cutting table, with 16-ft. separating belt, $100—cost $200; 1 Leader automatic end-cut cutting table, almost new, $150; 1 Adrian side-cut cutting table, $25; 1 Bucyrus board delivery cutting table, $25; 3 almost new friction clay hoisting machines, cost $150 each, $50 each; 6 clay dump cars, $8 each; 1 large boiler, $100; 1 six H. P. boiler, $30; 1 clay measuring and tempering machine, $50; kiln doors and grates, almost new, 1½c per pound; racks and pallets and belting.
F. G. L. NATURAL GAS BRICK WORKS,
5 1 d Cherryvale, Kan.

The Mitchell Slack Coal and Coking Furnace



The Mitchell One Door Coking Furnace IS NO EXPERIMENT.

Can be attached to any style of Kiln.

Guaranteed to be the cheapest and most economical furnace on the market to Construct and operate.

It positively excludes all cold air from coming in contact with your ware.

It requires nothing but the cheapest grade of slack from start to finish of burn.

For further particulars testimonials address

W. C. MITCHELL, Oelwein, Ohio.

FOR SALE — Repress brick machine; price $50.
MOORE STORAGE CO.,
4 2 d 563 Grand, Kansas City, Mo.

FOR SALE, CHEAP — One new two-mold United States dry press brick machine. Address BAY STATE IRON WORKS,
4 2 dm Erie, Pa.

FOR SALE — Complete outfit for chemical laboratory for clayworks. Address
5 3 d MARKET, care Clay-Worker.

FOR SALE — All the iron work of a Bonnott shaker rig; never been set up. For price address H. T. POPE,
5 1 e m Fort Payne, Ala.

WANTED — A good second-hand all-iron double-geared pug mill, not less than 30,000 capacity. Lowest cash price.
T. SAUSELEIN.
5 1 c Maple Shade, N. J.

WANTED — A competent terra cotta modeler capable of handling any architectural work. Apply, with references, WASHINGTON, BRICK, LIME & MFG. CO., Spokane, Wash. 5 1 d

FOR SALE — Ten tons of new 12-pound steel "T" rail, with splices and bolts; 5 small end dump cars, good as as new.
THE TRIMBLE BRICK MFG. CO.,
5 1t d Trimble, O.

WANTED—Position as superintendent or assistant superintendent of stiff clay brick plant. Many years experience and the best of references. Address, BRO. WATKINS,
[4 1 k] care Clay-Worker.

FOR SALE — One good 35 H. P. Chandler & Taylor engine; 40 H. P. tubular boiler; hot and cold water pumps; all in good condition. Will be sold cheap.
C. & A. POTTS & CO.,
5 tf d Indianapolis, Ind.

FOR SALE — One four-mould Boyd Dry Press; one Carmichael Clay Steamer, elevator, shafting, etc. All in good condition. Correspondence solicited. Address
STANDARD BRICK CO.,
5 1 d care Clay-Worker.

WANTED — A practical man as superintendent to take charge of a yard making stiff and soft-mud brick; capacity from 25 to 30 M daily; steam dryer. Permanent position to right man. Address R. B.,
5 1 d m care Clay-Worker.

WANTED — SITUATION—As superintendent or burner of face brick plant; thoroughly familiar with the manufacture of all colors and the demands of a first-class trade. References.
5 1 d J., care Clay-Worker.

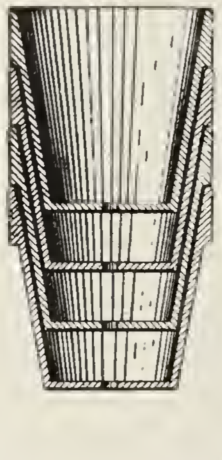
POSITION WANTED — Practical man wishes position as manager; experienced in the manufacture of fire and other clay products; stiff or soft-mud process; all kinds of kilns; will take entire charge. Address D. G. H.,
5 1 c care Clay-Worker.

WANTED — By a practical man of thirty years' experience a place as superintendent of an up-to-date brick works. Will be pleased to refer any who need a good man to my last places for character and ability.
SUPERINTENDENT,
5 2 c m care Clay-Worker.

WANTED — Partner and location to start new plant where slack coal is cheap and good clay and railroad accommodations can be obtained. For particulars address patentee of the Swift Slack Coal Coking Table Furnace Kiln. F. E. SWIFT,
Washington, Iowa.

WANTED—Position by general superintendent, thirty years practical experience manufacturing finest grades of front brick and all kinds of building material made from clay for New York and Chicago markets Have constructed, also remodled works now running successfully. Ex-cellent references. Address
[4 1 1p] JAP, care Clay-Worker.

WANTED — POSITION—Twenty-two years' experience; thorough potter; enameled bricks by single fire process; glazed and semi-glaze architectural terra cotta, both white and colored at one fire; terra cotta slips. Can burn and take full charge. Have position, but not pleased with locality. Good references furnished. Address
5 1t t EUREKA, care Clay-Worker.



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WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,
78 South Pennsylvania St., INDIANAPOLIS, IND.

Evens & Howard Fire Brick and Sewer Pipe Company,

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Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS Agent and Patentee, **161 Grand Street, Rahway, N. J.**

"LEVIATHAN."

"Upon Earth There is not His Like.'

....Sept ....1896.
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55 and 57 Market St., Chicago, Ill.

GENTLEMEN:—Please ship us via freight, 146 feet x 18" 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige. Yours very truly,
....

Manufactured under Special Process.
A Guarantee of Superiority.

NOTE.—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

MAIN BELTING COMPANY,

Sole Manufacturers LEVIATHAN BELTING,
55 and 57 Market St., CHICAGO, ILL.
PHILADELPHIA; 1219 Carpenter Street. BOSTON 120 Pearl Street.

F. H. C. MEY,

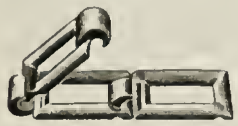
Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.

Mey Detachable Chain Belt.



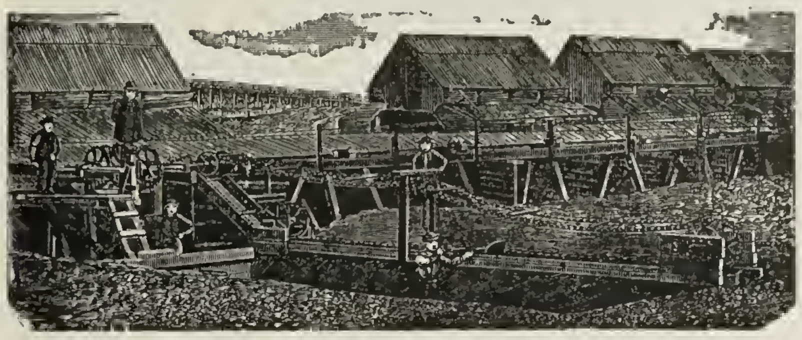
Ewart Detachable Chain.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to

Make Many More Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

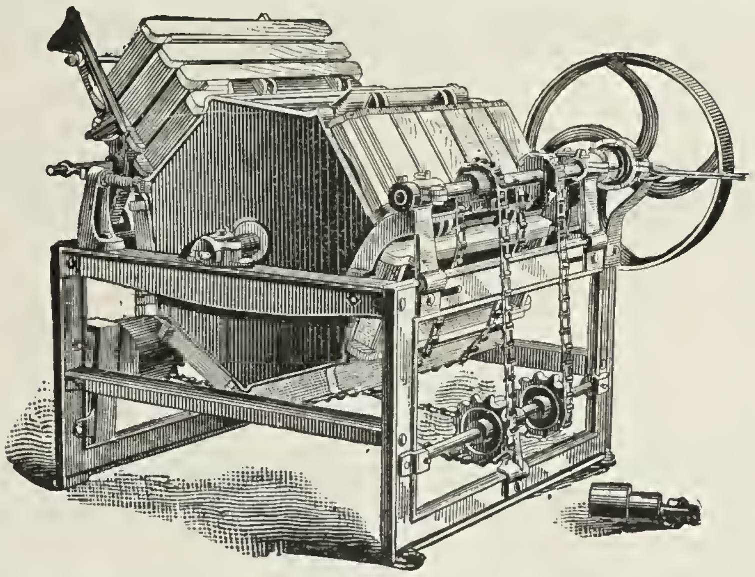


MEY PATENT CLAY ELEVATOR.

Send for Catalogue

CHAMPION Brick Mould

SANDING MACHINES.



No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

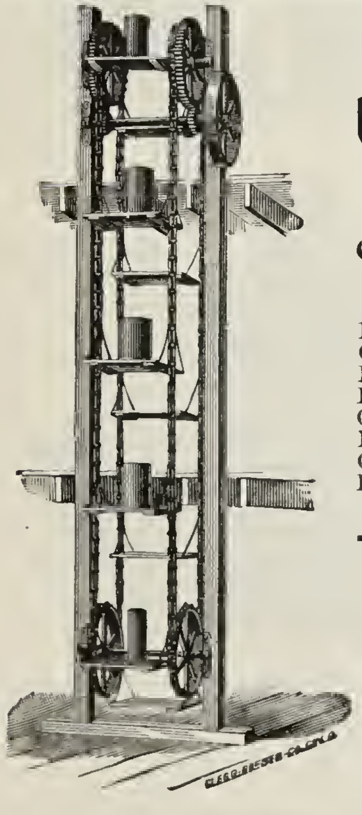
My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.

We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been succesful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.



Tile and Package Elevators.

JEFFREY

Elevating, Conveying and Power-Transmission ——Machinery,

Designed to Suit the Conditions for Handling

CLAY, BRICK, GREEN TILE, SEWER PIPE, SAND, COAL, Packages of every description, etc, etc.

- Elevator Buckets,
- Cable Conveyors,
- Elevator Bolts,
- Elevator Boots,
- Clutches,
- Rubber Belting,
- Cotton Belting,
- Leather Belting,

- Spiral Conveyors,
- Link Belting,
- Sprocket Wheels,
- Shafting,
- Gearing,
- Hangers,
- Pulleys,
- Chains, (all styles).

The JEFFREY MANUFACTURING CO.,

Columbus, Ohio.

Send in your Specifications. We want your next Order.

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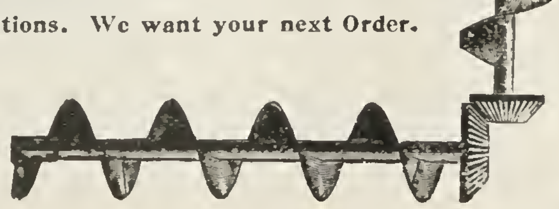

FOR SALE — 150,000 new and second-handed pine pallets, 32 and 34 inches long, ten wide.
J. F. STENGEL,
1 6 c Ellicott Square, Buffalo, N.Y.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — Several second-hand chain hoists, from 2 to 8 tons capacity; also several engine lathes, boilers, engines, pumps, etc. Address CLEVELAND,
3 tf d Care Clay-Worker.

FOR SALE — One Old Reliable soft mud brick machine, geared for steam, with six molds, bump and dump tables, sand and water boxes; the outfit is in good repair, and will be sold very cheap. Address
"CRAWFORD,"
3 3 d Care Clay-Worker.

FOR SALE — One automatic end cut Chambers machine; 25,000 daily capacity; all complete and in first-class condition; a bargain. Write
CHAMPION BRICK WORKS CO.,
4 2 dm Wellsville, O.

FOR SALE — A brickyard with annual output of 400,000; drying sheds, good brick residence; five acres of land well set in fruit; good market. Address
W. A. BABCOCK, Ipava, Ill.
4 3 cm Or J. R. GAIN, Kokomo, Ind.

FOR SALE—GREAT BARGAIN—Henry Martin "A" Brick Machine, capacity 30,000, very good order; pug mill, crusher, elevator, shafting, etc, $750. All in first-class working order. Good 30 horse power Erie engine and boiler, $400.
1 tf dm BOX 13, care Clay-Worker.

FOR SALE — Second-hand brick machinery of all kinds, very cheap; brick machines, cutting tables, pugmills, represses, screens, etc.; will give some great bargains in this class of machinery; write us for prices and description of what we have. Address
THE BONNOT CO.,
3 3 d Canton, O.

FOR SALE — Controlling interest in a vitrified paving brick plant; daily capacity, 60,000; five down-draft kilns, 200 capacity each; fine shale bank, with four-foot vein of coal under property; one of the best locations in the Southwest; to a practical brick man this is a fine opening. Address
4 3 c GAR, care Clay-Worker.

FOR SALE—Four-mold Boyd Dry pressed brick machine, quite new, at half cost. Capacity 25,000 to 30,000 per day. Also one 4-mold Eureka dry pressed brick machine, good order; great bargain. One straight line engine, 14x14 cylinder; excellent order; very low. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator.
C. SIEDLER, Pres.
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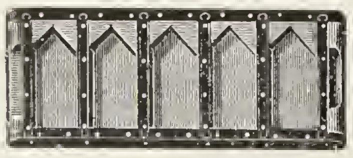

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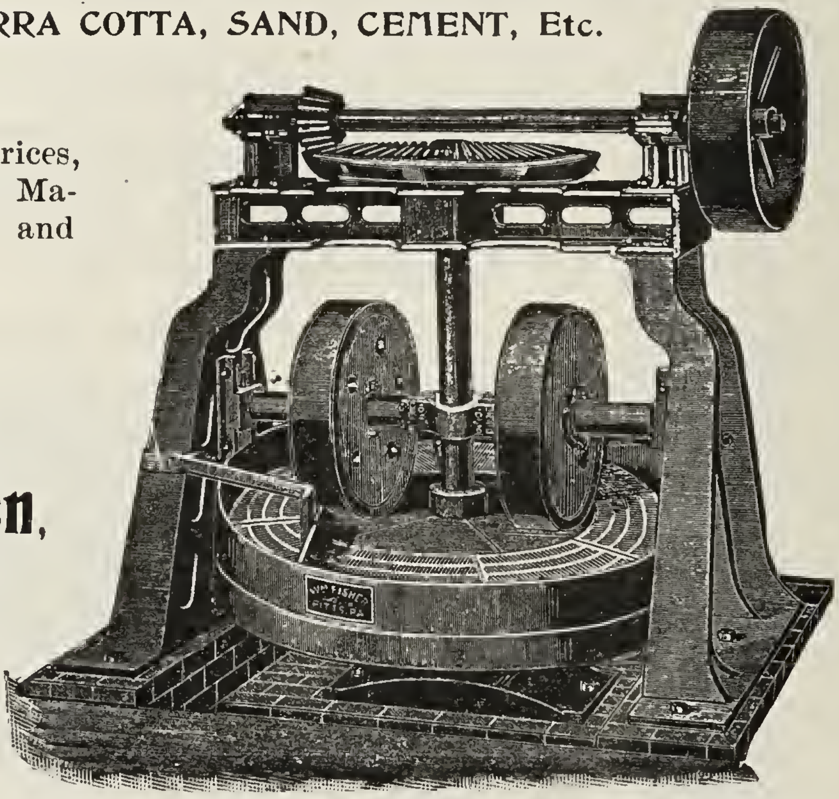

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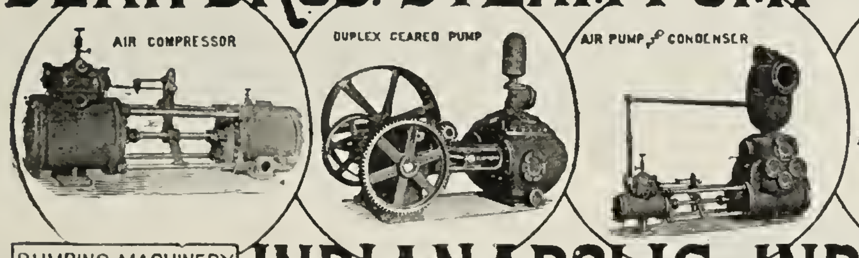

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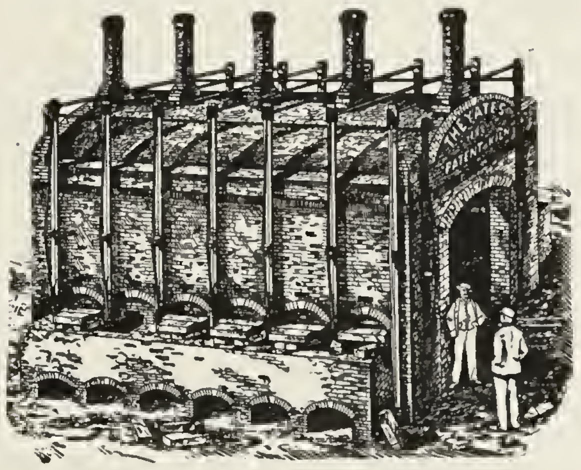

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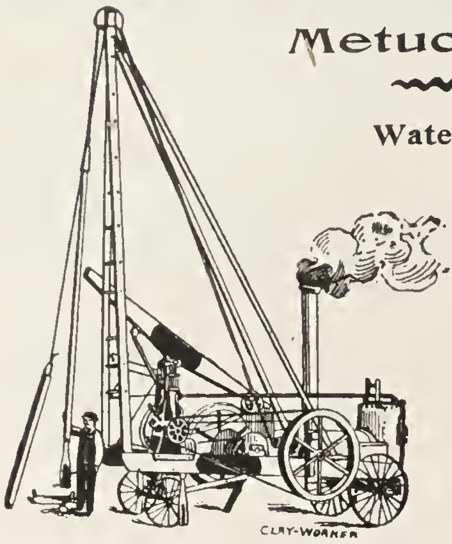

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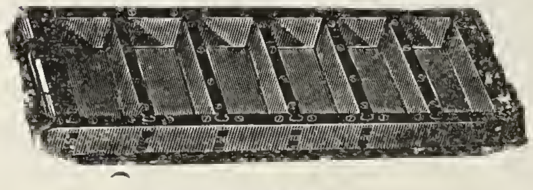

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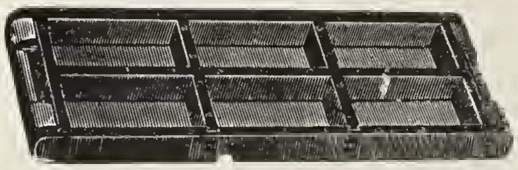

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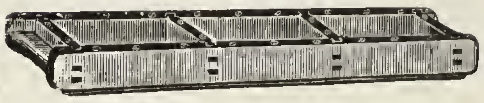

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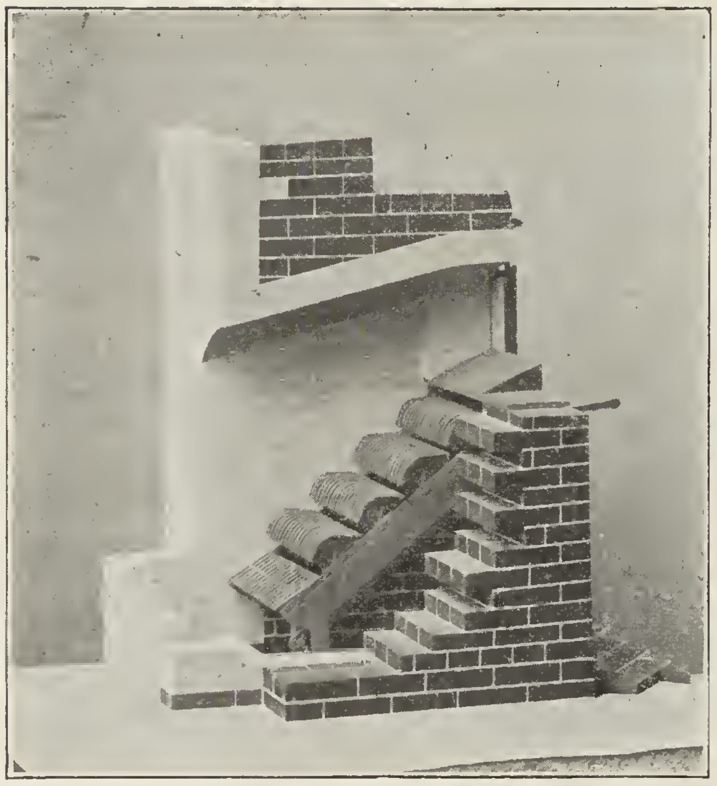

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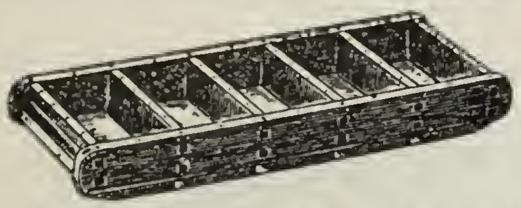

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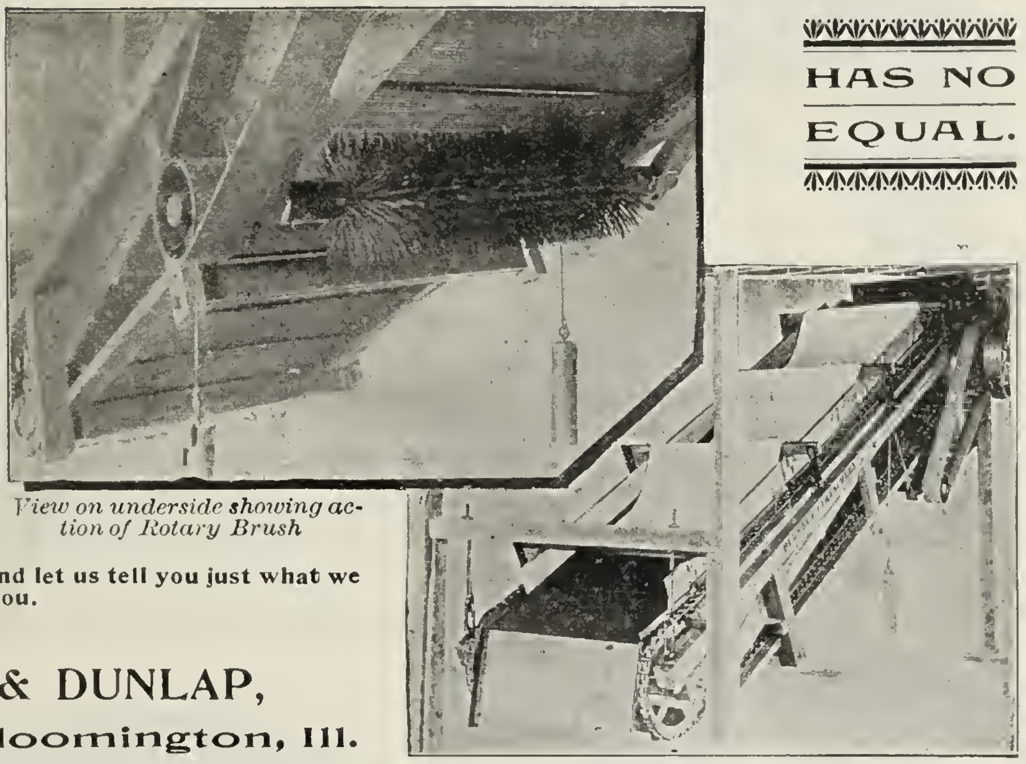

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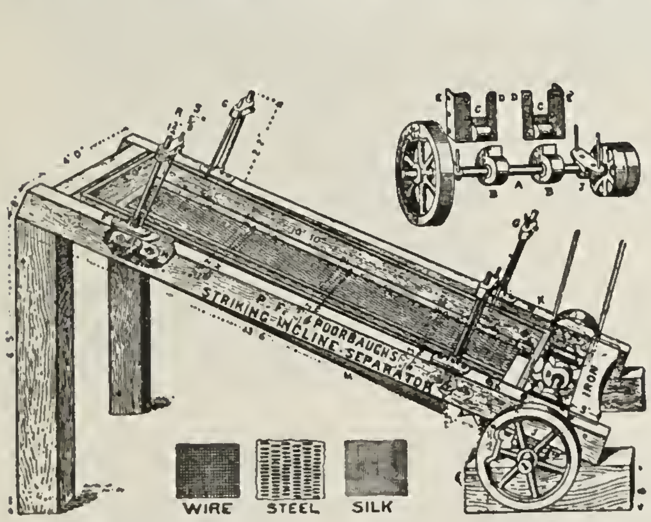

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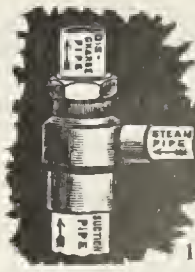

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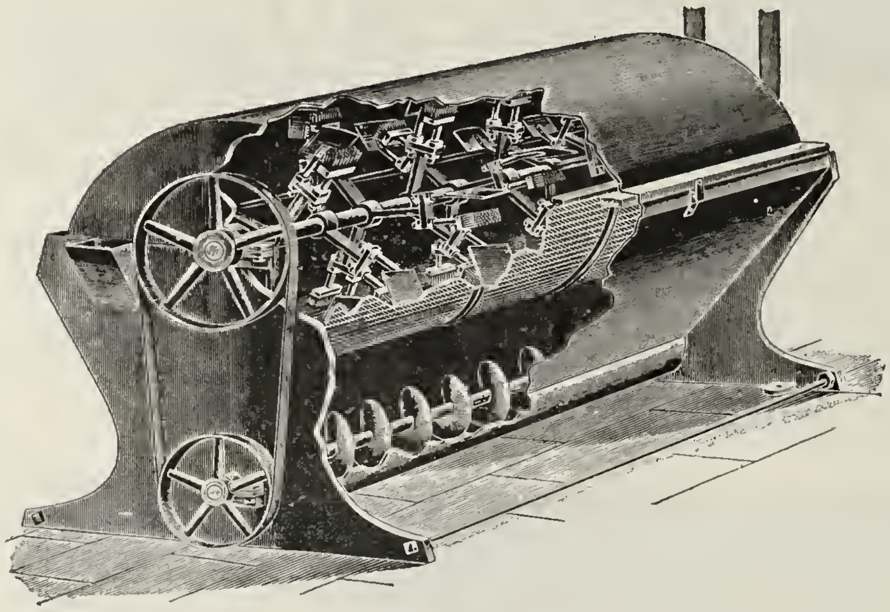

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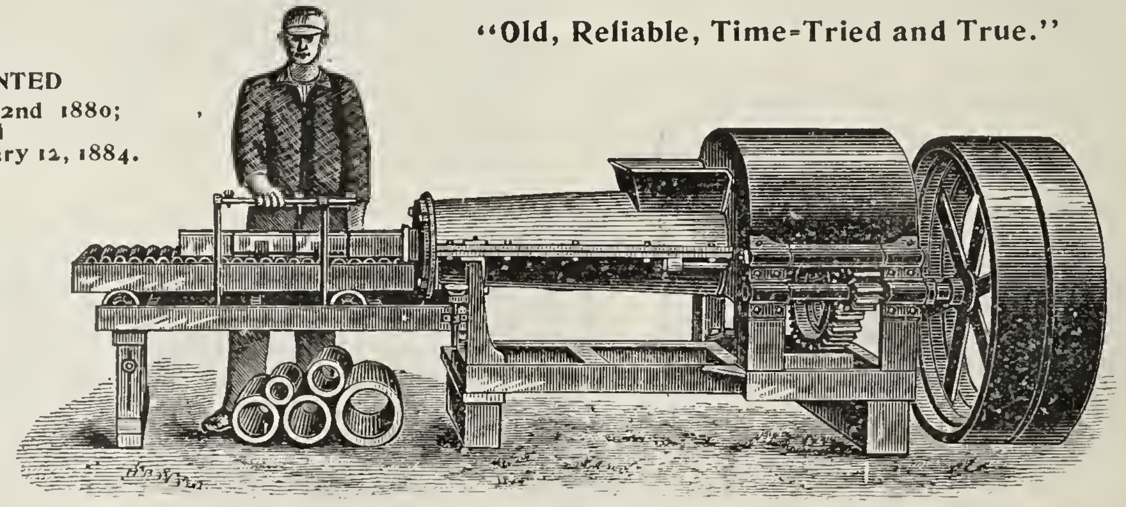

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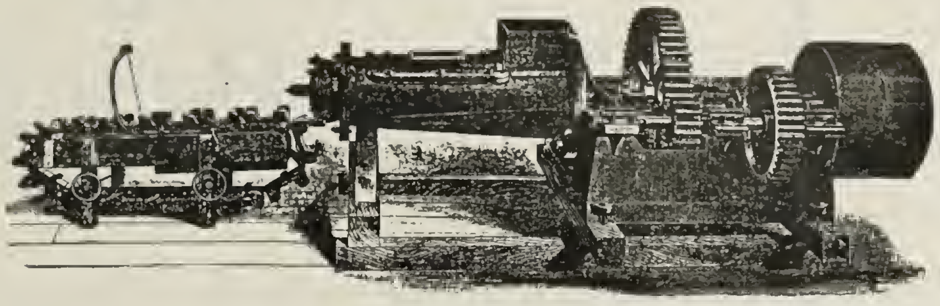

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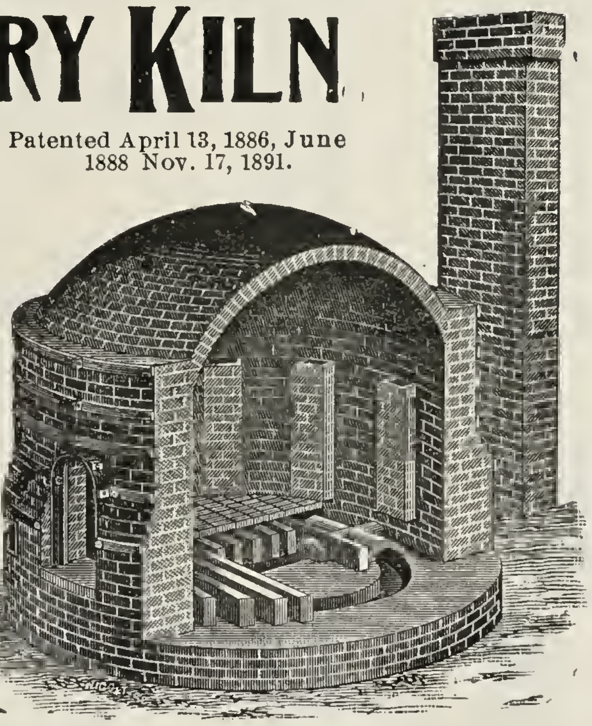

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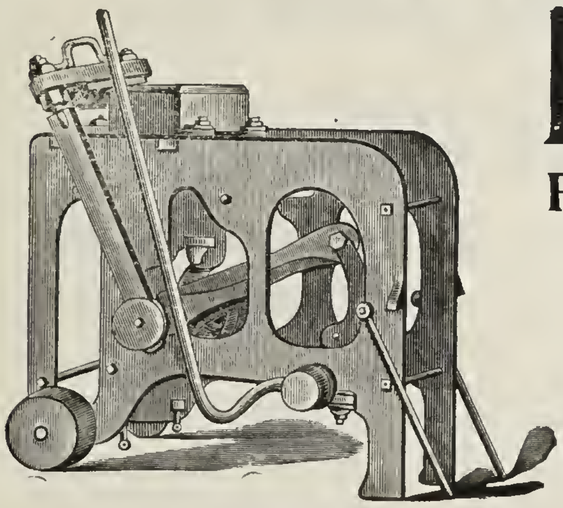

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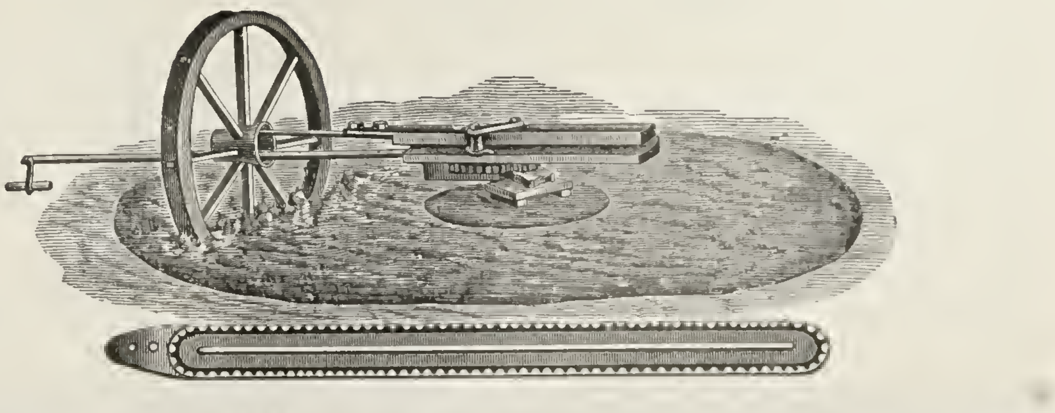

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of VEEDERSBURG,
INDIANA,

Can find time to prepare his "ad." it will occupy this space. Meantime, if you would know about his Company's material and its splendid merits, write for a list of the Cities and Towns that have used it.

Vitrified Paving Brick.

—•—

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of $1.00.

—•—

T. A. RANDALL & CO.,
Publishers,
INDIANAPOLIS, IND., U. S. A.

The PURINGTON PAVING BRICK CO.,

of GALESBURG,
ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

T. B. McAVOY,
PRESIDENT.

FRANK B. McAVOY,
SEC. AND TREAS.

—•—

McAvoy Vitrified Brick Co.,

of PHILADELPHIA,
PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA.
WORKS:—PERKIOMEN JUNCTION, PENN.

The Des Moines Brick Manufacturing Co.,

—MANUFACTURERS OF—

Vitrified Paving Brick,

DES MOINES, IOWA,

Is operating a plant with a yearly capacity of Thirty Million Paving Brick, with unsurpassed shipping facilities.

Estimates on Brick pavements cheerfully given.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

Correspondence solicited.

Office and Works: **Clinton, Ind.**

INDIANA PAVING BLOCK,

The Standard Shale Block for Street Paving.

Manufactured at Brazil, Ind., by the

Indiana Bermudez Asphalt Co.,

Main Office, 25 and 26 Baldwin Block,
INDIANAPOLIS, IND.

Prices and samples furnished on application to above address.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT,
COALDALE, ALA.
TELEGRAPH OFFICE,
WARRIOR, ALA.

BRANCH OFFICES,
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

J. L. HIGLEY & CO.,
CANTON, OHIO.

Four of the largest and best paving brick plants in the world.

Canton Paving Block,

Head the list for uniformity, finish and wearing qualities.

Samples sent free on application.

Write for prices.

9 Outfits in One Month. Why?

They are { *BUILT RIGHT,*
SOLD RIGHT.

Pendleton, S. C., April 19, '99.

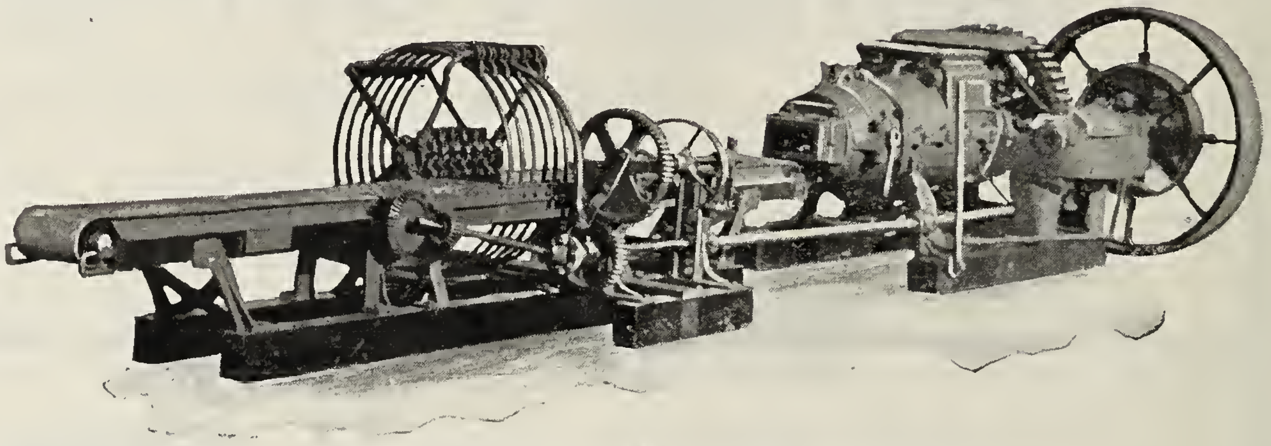
GENTS:

The Automatic Side Cut Table is the finest thing of the kind I have ever seen.

J. C. STRIBLING.

—•—

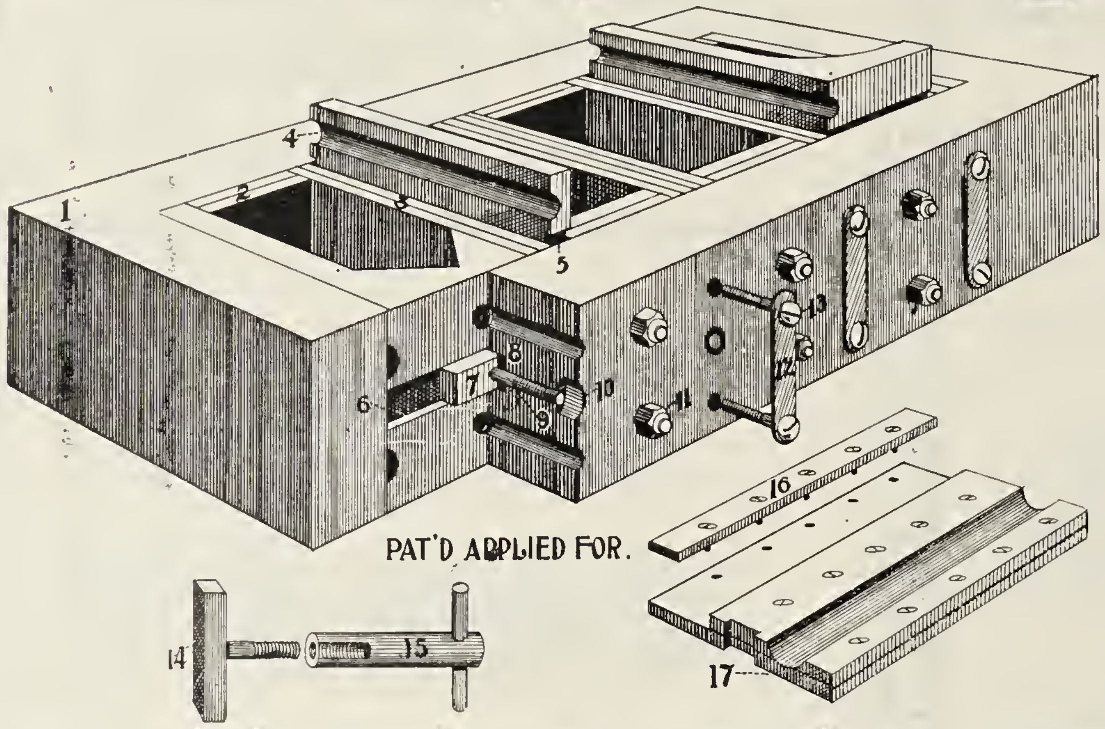
END OR SIDE CUT BY CHANGING REEL FRAME.



X-tra and Automatic Side Cutter.

J. C. STEELE & SONS, Manufacturers of The "NEW SOUTH" BRICK MACHINERY, **Statesville, N. C.**

BRICK MOULD LINERS.



THE only Reliable System of Adjustable Hard Steel Liners and Shape Moulds in existence. Can be adjusted to suit any Dry Press Machine.

Patent Adjustable Liners and Ornamental Moulds of all Description.

Arch Brick, Sizing Machines and Patent Automatic Liner Grinders.

Ervin Special Machine and Tool Co.,
25-27 Champlain St., CLEVELAND, OHIO.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

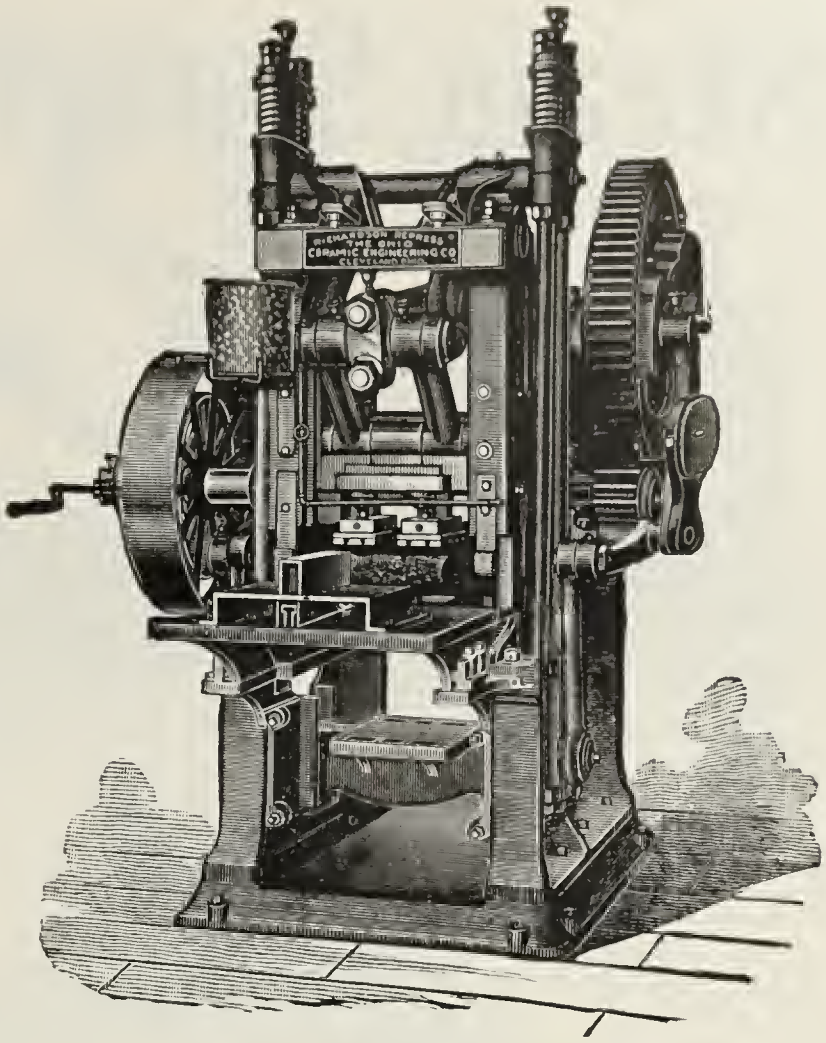
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.

WE KNOW HOW


RICHARDSON REPRESS
THE OHIO
CERAMIC ENGINEERING CO.
CLEVELAND, OHIO.

To build Brick Machinery—take our RICHARDSON REPRESS for example—manufacturers of brick who have used it, say it is the most practical and serviceable machine on the market.

Our other machinery is of equal merit.

Our Catalogue tells something about our line.

THE RICHARDSON REPRESS.

The OHIO CERAMIC ENGINEERING CO.,
CLEVELAND, OHIO.

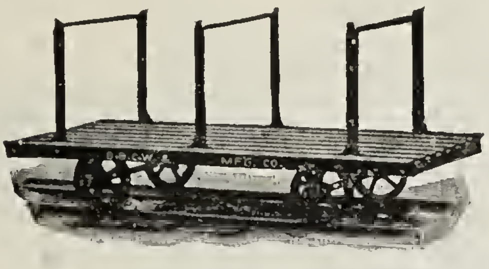
The Atlas Bolt & Screw Co.,

Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

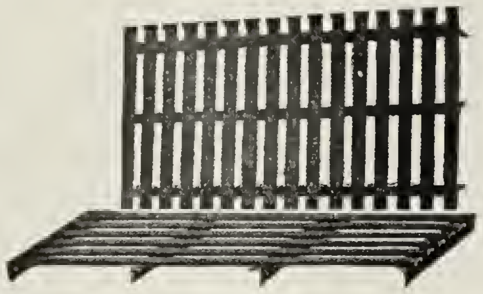
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

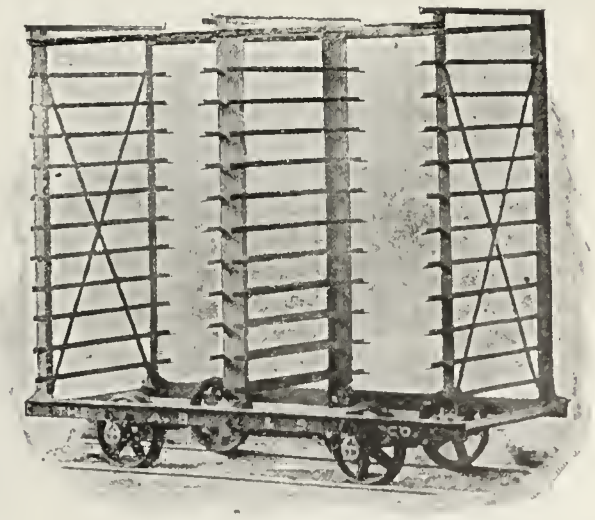
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

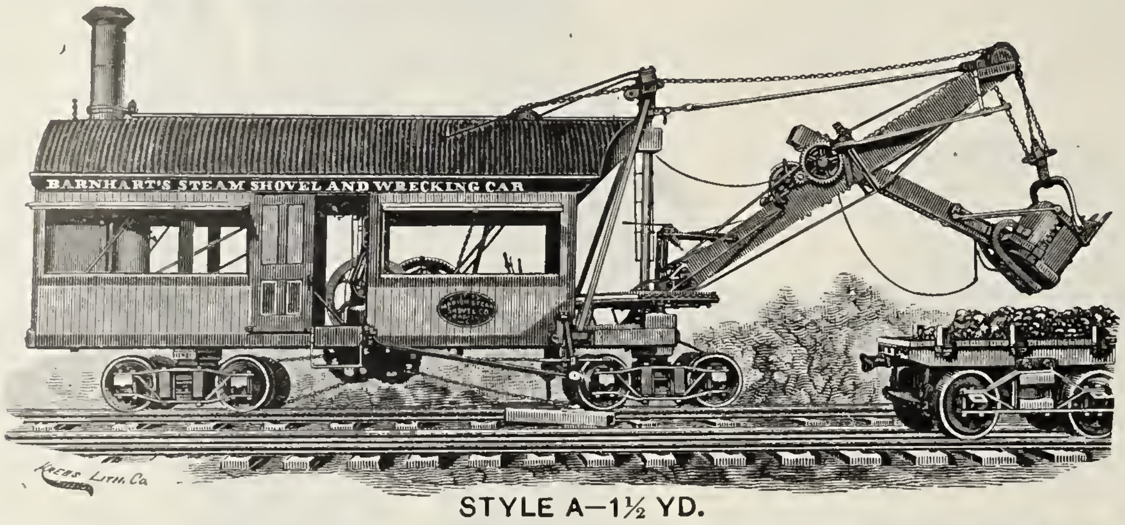
For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

Steam Shovels for Brickyards.


BARNHART'S STEAM SHOVEL AND WRECKING CAR

STYLE A—1½ YD.

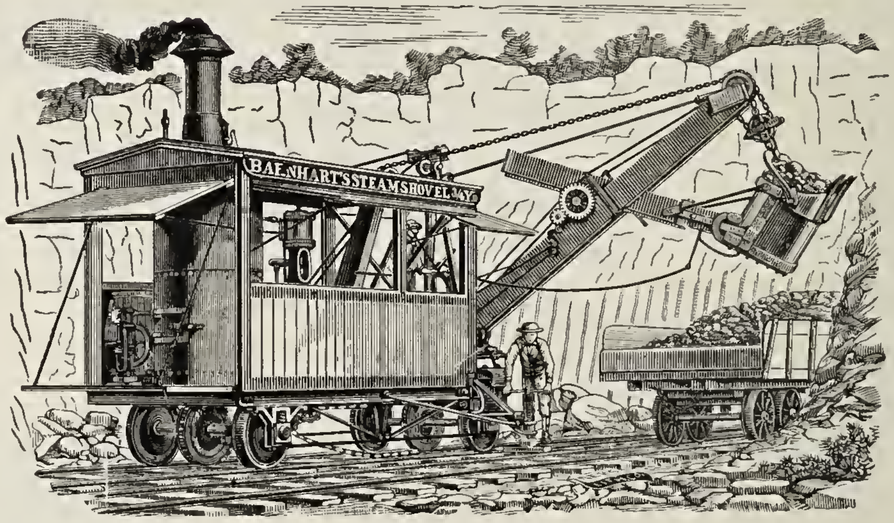
OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**

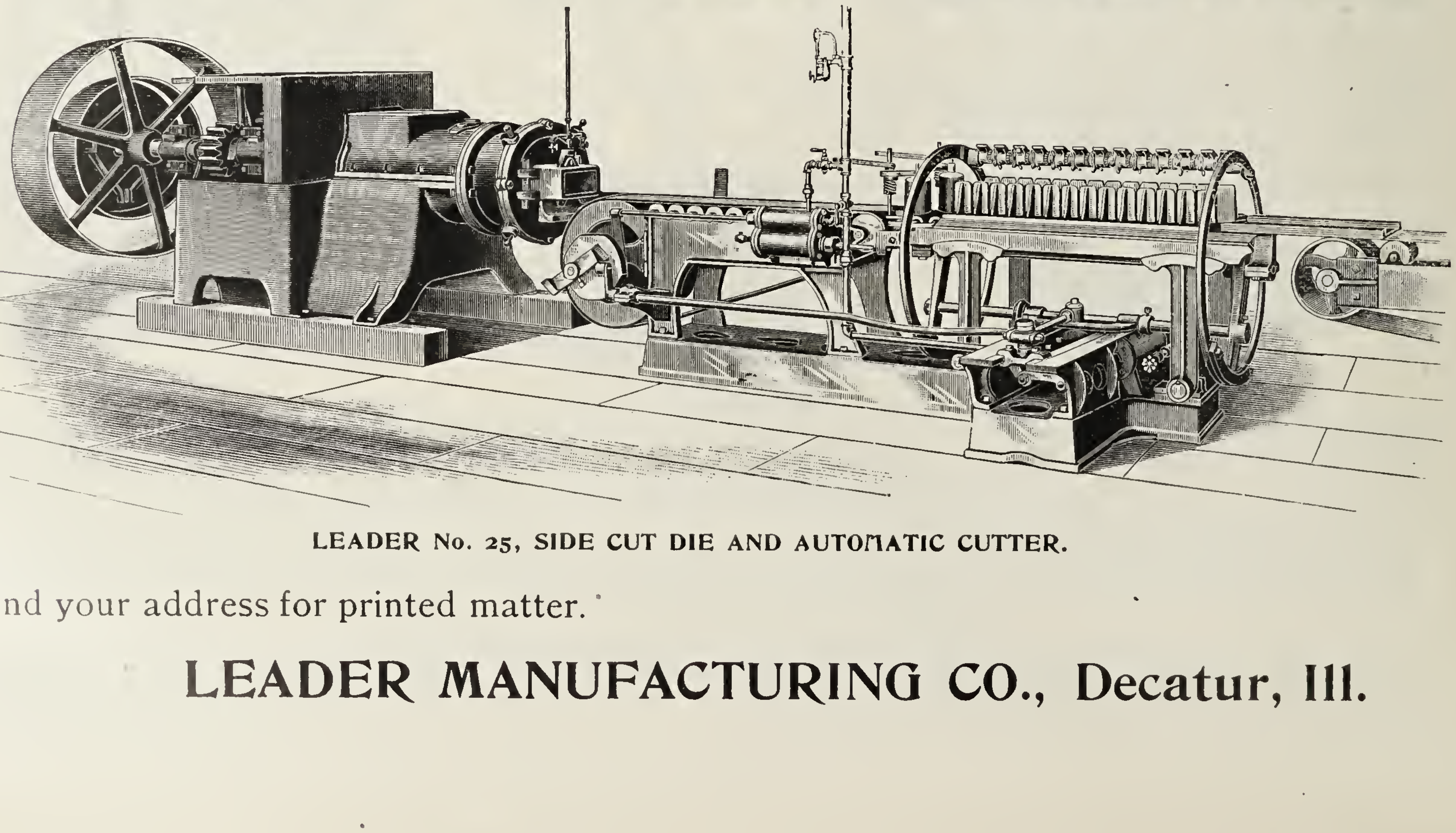


STYLE C—¾ YD.

THERE'S ONE BRICK MACHINE

That does the most work of the highest quality with the least power and repairs,

That's the Leader.



LEADER No. 25, SIDE CUT DIE AND AUTOMATIC CUTTER.

Send your address for printed matter.

LEADER MANUFACTURING CO., Decatur, Ill.

If You Want the BEST

Dryer Cars

At a **very reasonable price** give us an opportunity to show you our new designs. We have used them in the **Brick Business** and have overcome the **weak points.**

CLEVELAND CAR CO.,
150 Scranton Ave., CLEVELAND, OHIO.

Mention the Clay-Worker

THE ANDERSON

Horse Power Brick Machine

Surpasses all others for Simplicity, Strength and Durability; Quantity and Quality of Brick. Requires less power than any other.

We Manufacture

The Horizontal Anderson Brick Machine,

The New Anderson Up-right Brick Machine,

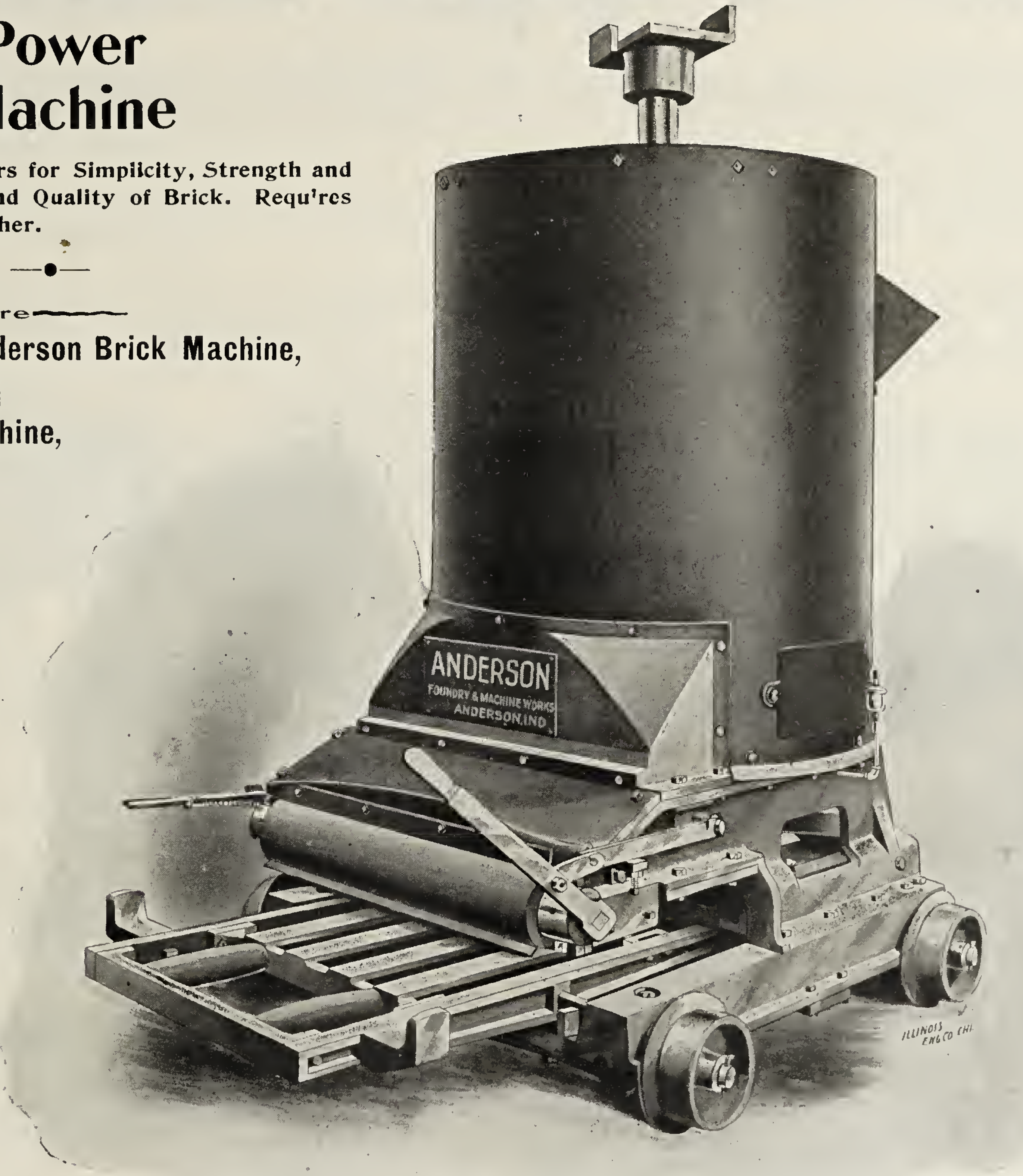
The Anderson Sectional Roll Disintegrator,

The New Departure Tile Mill.

The only machine made for making tile and fire-proofing from 3 to 30-inch in diameter.

Pug Mills,
Elevators,
Moulds,
Trucks,
Barrows,

And all Brickyard Supplies.



1899 Horse Power Brick Machine,

MANUFACTURED BY

THE ANDERSON FOUNDRY & MACHINE WORKS, Anderson, Indiana

Have You Ever Considered This?

That a Very Small Quantity of

Dixon's Ticonderoga FLAKE GRAPHITE.

Say 5 to 10 per cent. added to the grease or oil that you are now using, will make you oil or grease do three to six times as much work and do it much better.

This has been fully demonstrated but if you want to prove it for yourself we will send you samples free of charge and a pamphlet giving full particulars.

JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

Horseheads Brick Co., N. Y., August 13, 1898.

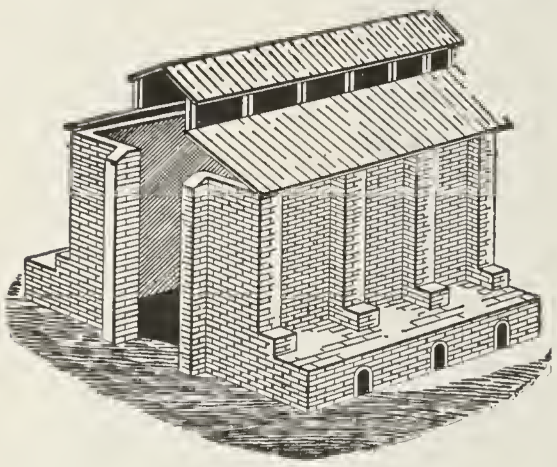
Mr. H. HAIGH, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success. In fact we have been able to do much more than you had guaranteed the kiln would do. We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours,
R. G. EISENHART, Treas. and Gen. Man.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

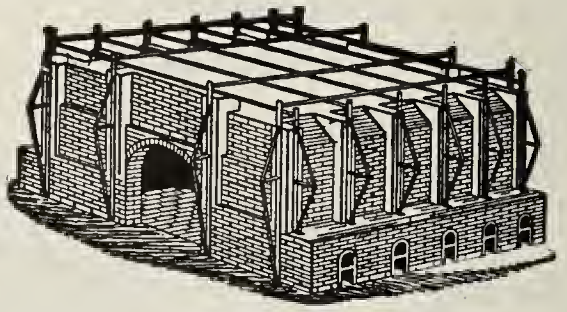


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL,* 2,422 Chestnut St., *Kansas City, Mo.

MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

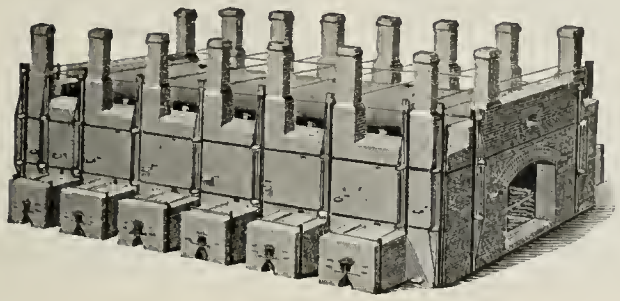
It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

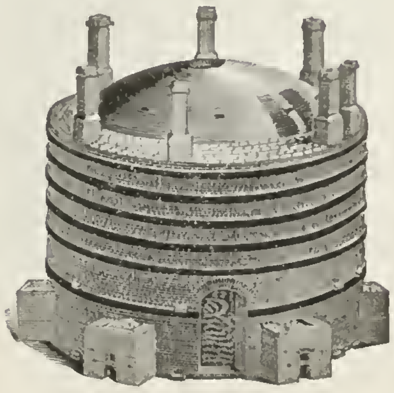
Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,
P. O. Box 335. *ROME, GA., U. S. A.*

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.





These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. **Cincinnati, Ohio.**

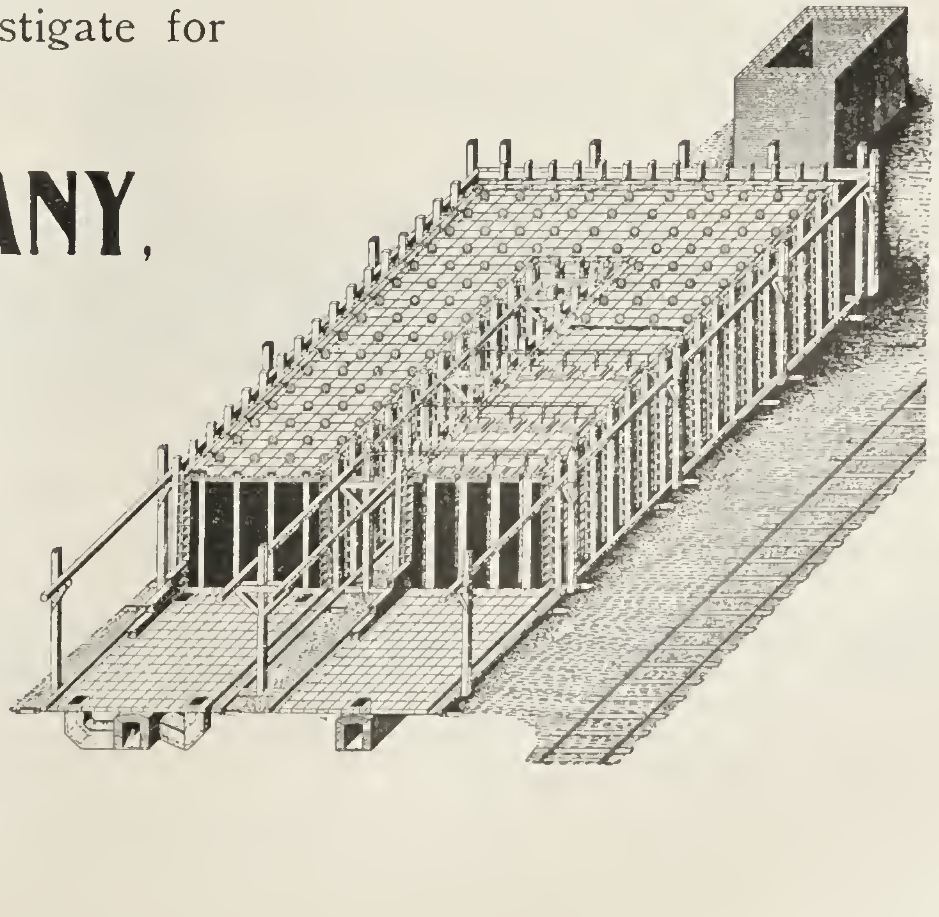
The Lehmann Portable Continuous Kiln,

And the Lehmann Slumming Apparatus

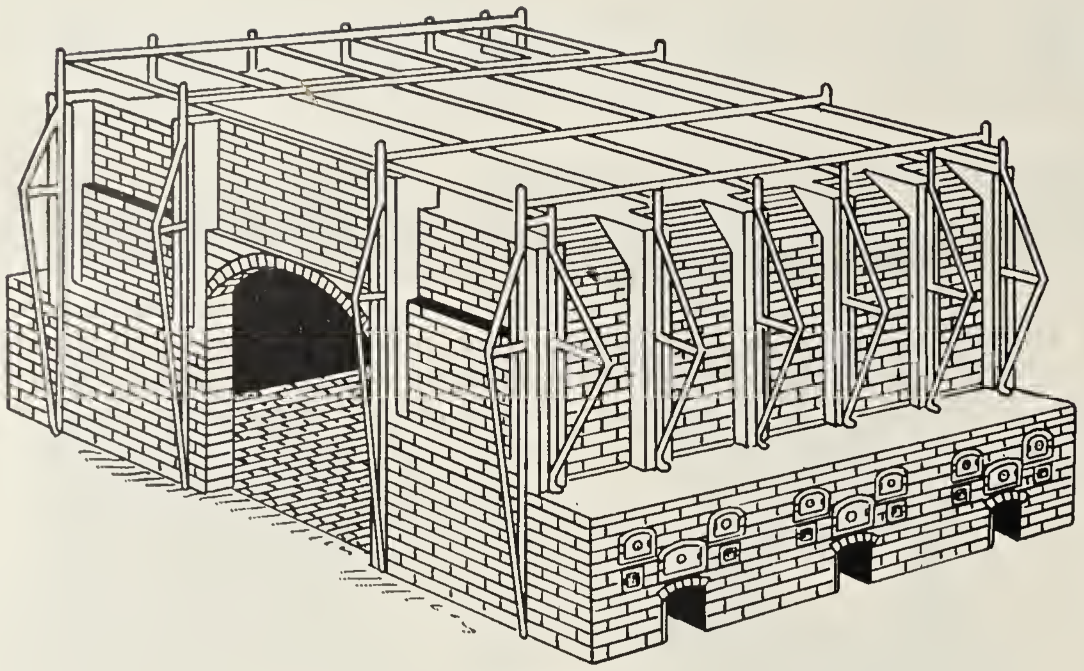
Are in successful operation at the Lehmann-Kohlsaat Clay Works, at the foot of West Wellington Street, Chicago, Ill. Every clay worker is invited to visit these works and investigate for himself.

F. LEHMANN & COMPANY,
Foot of West Wellington Street,
CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers, Plans and estimates furnished for Brick, Lime and Cement Works. Practical tests made.



THE LEHMANN CONTINUOUS KILN has been in successful operation with crude oil during the last year and can be adapted to all kinds of fuel.



PATENTED.

The GRATH

IMPROVED
DOWN=DRAFT

BRICK KILN,

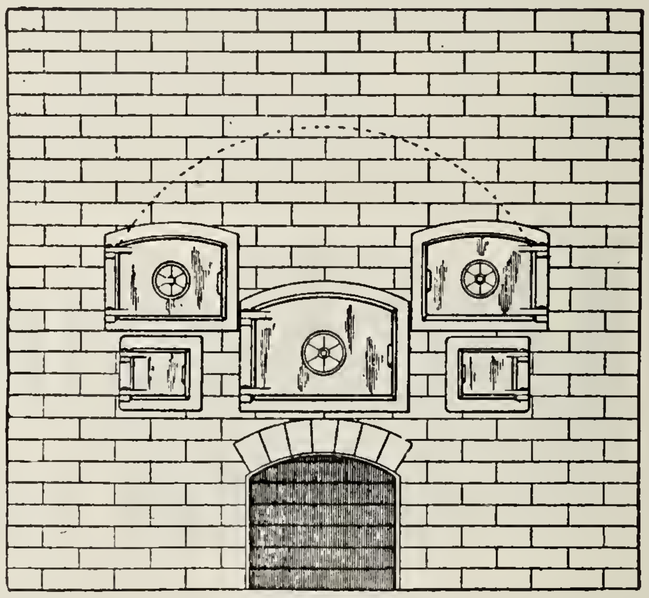
With the Grath Gas and Coking Furnaces attached will produce a larger percentage of Face or Vitrified brick, than any other kiln in the market.

Built any size wanted. Singly, in groups or on the Continuous System and will guarantee the results of over 90 per cent. first class Face or Vitrified Brick. Can also be used for Fire Brick, Sewer Pipe, Pottery, Porcelain or Terra Cotta.

The GRATH GAS and COKING FURNACE.

This is the **ONLY** Furnace which consumes all the fuel and black smoke producing as much heat from one ton **slack** as can be obtained from same amount and kind of lump in ordinary furnaces.

The **ONLY** furnace which heats the fuel in Coking Chamber from top and bottom and is therefore the best Furnace. All parties using this method will be prosecuted for infringement.



PATENTED.

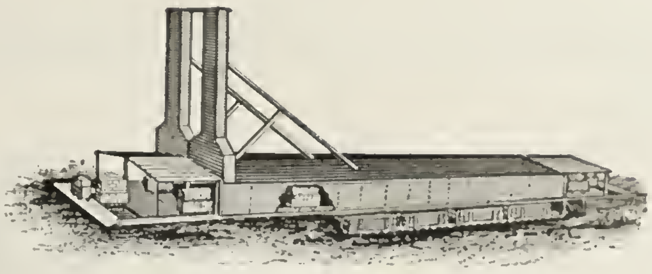
For grinding brick for arches we have the **best** devise in the market, no white sand required. Brick stays clean and it is in the reach of all as it is the cheapest process in the market.

Attention is called to the Grath Triple Pressure Hand Power Ornamental Press for making brick from dry clay. For Simplicity, Great Pressure and Durability, this Press has no equal and is within the reach of all, and is guaranteed in every respect to be the most perfect and most powerful Hand Power Press in the market.

FOR FURTHER PARTICULARS, ADDRESS

The ILLINOIS SUPPLY & CONSTRUCTION CO.,
St. Louis, Mo.

National Bank or Coal Bank,



Chicago Iron Clad Dryer.

Is the Vital Question.

Chicago Brickmakers prefer depositing with the former. The accompanying letter from one of Chicago's leading brickmakers kindly offering the secret to all Brother Brickmakers seeking for light. A perusal of this letter will illuminate the fact that management and proper appliances determines which bank receives the deposit.

Telephone Main 4132.

LABAHN BRICK CO.,
MANUFACTURERS OF
Building Brick.

Yard: Lansing, Ill., on Panhandle R. R.
Box 408, Builders' and Traders' Exchange.

OFFICE: 159 LaSalle Street, Room 97.

Chicago, February 1st, 1899.

MR. A. F. BARRON,
Successor to Wolff Dryer Co., Chicago.

Dear Sir:—Your favor of January 30th, received. In replying to same, regret that I am unable to furnish you with the cost of fuel for drying our brick. Our steam power is so situated that we are unable to separate or divide it up so that the machinery and dryer could be run separately.

The best that I can do for you in this direction is to furnish the amount of steam power used to run our entire plant and fuel consumed for generating steam and burning brick.

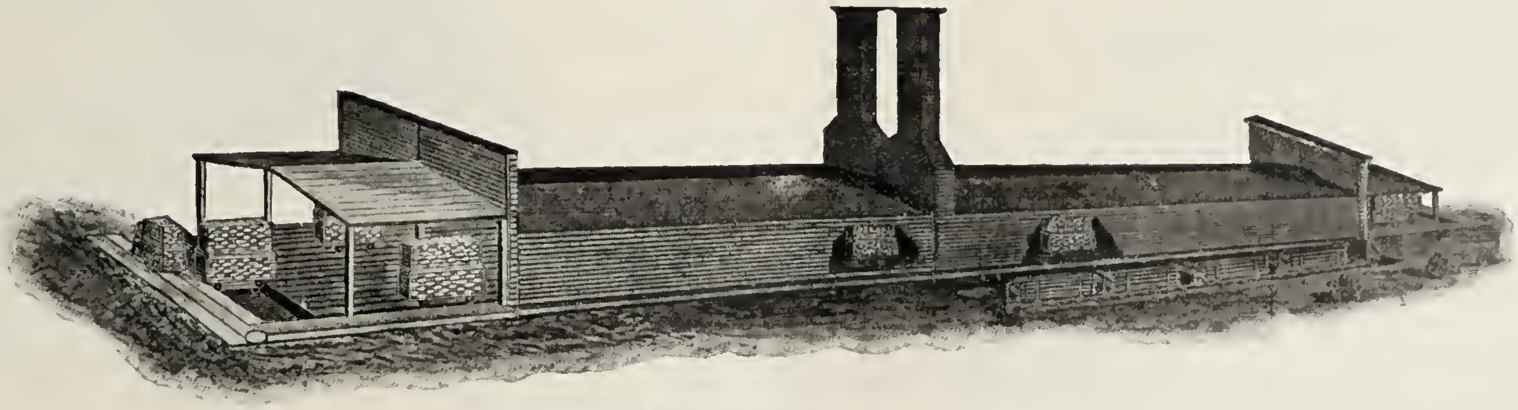
The capacity of our plant averages one hundred and thirty-five thousand (135,000) per day in the years business.

The entire plant in run economically with three boilers, 125 horse power each. These boilers furnish the necessary steam required to run all machinery for making the brick, and likewise supplying the live steam which runs the dry house, drying our entire output, and all other purposes where steam is used about the premises. We are using Brazil block (soft coal) for generating steam, and this coal and wood for firing the kilns. The average cost per thousand for the entire product is seventy cents, for making, drying and burning. Our dry house has been in active service for the past six years. Since adding your improvements three years ago, in order to meet the increased capacity of our machinery, it has responded to all demands upon it Winter and Summer without diminution of capacity or perceptible difference in consumption of fuel. It is therefore needless to say that we are well pleased, and in fact should be more than satisfied, as the dryer turns out fifty per cent more brick than your contract specified.

Possibly these statistics may be of value to some brother brickmaker and yourself personally. We would therefore say to you that our plant and our books are open and free for inspection by all brickmakers seeking for light upon this important subject.

The foregoing is a just tribute to the merits of your Iron Clad Dry House and honorable methods of carrying out agreements. Our dry house is a four tunnel, sixteen track dryer, 112 feet long.

Yours very truly,
LABAHN BRICK CO.
John F. Labahn, President.



THE BARRON TENDER CLAY DRYER.

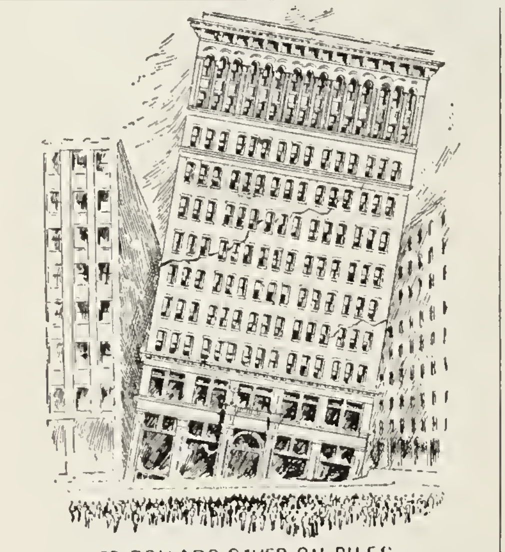
We build dryers to meet the peculiarities of the various clays. Innformation furnished.

A. F. BARRON,

Successor to WOLFF DRYER CO.,
Cor. Dearborn and Quincy Streets, CHICAGO, ILL.

THE....
A. B. C.
....OF

ECONOMY.



75 DOLLARS SAVED ON PILES

CAN you imagine a builder erecting a 16-story building and saving $75 by driving cheap or second-hand piles for a foundation.

What would you think of such economy, which would surely shorten the life of that building?

⁂

SAVED A FEW DOLLARS ON COMPASSES

CAN you imagine a steamboat company building a palatial steamer costing millions and then saving a few dollars on cheap compasses when such a saving would result in that floating palace being crashed to pieces on hidden rocks.

What would you think of such economy?

⁂

SAVED 25 CENTS ON PICTURE WIRE

WHAT would you say of a picture dealer saving 25 cents by using cheap wire to hang a $500 picture over a lot of costly vases. Or the watchmaker who built a $400 chronometer and saved 50 cents on a cheap main-spring.

IN EACH CASE the appalling feature is the smallness of the actual saving as compared with the greatness of the risk you run. It may have a parallel in your own case. The saving of a few dollars on machinery may mean that your investment will prove a losing one. Cheapness is dear at any price!

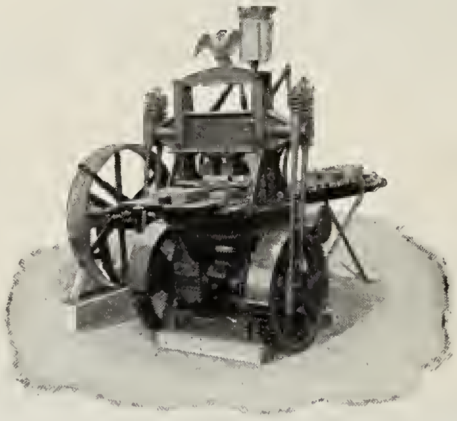
You don't deposit your money with the cheap skate banker.

If you're sick and want to get well you don't employ the cheapest doctor.

If you want to win your case in court you wouldn't hire the cheapest lawyer.

If you want to win success in your business start right by putting in the best machinery. It's the cheapest in the long run. We build every class of clay-working machinery. It's the cheapest because it's the best. Write for particulars.

DURING JANUARY, FEBRUARY AND MARCH OF '99 MORE EAGLE REPRESSES WERE SOLD THAN DURING THE TWELVE MONTHS OF '98.

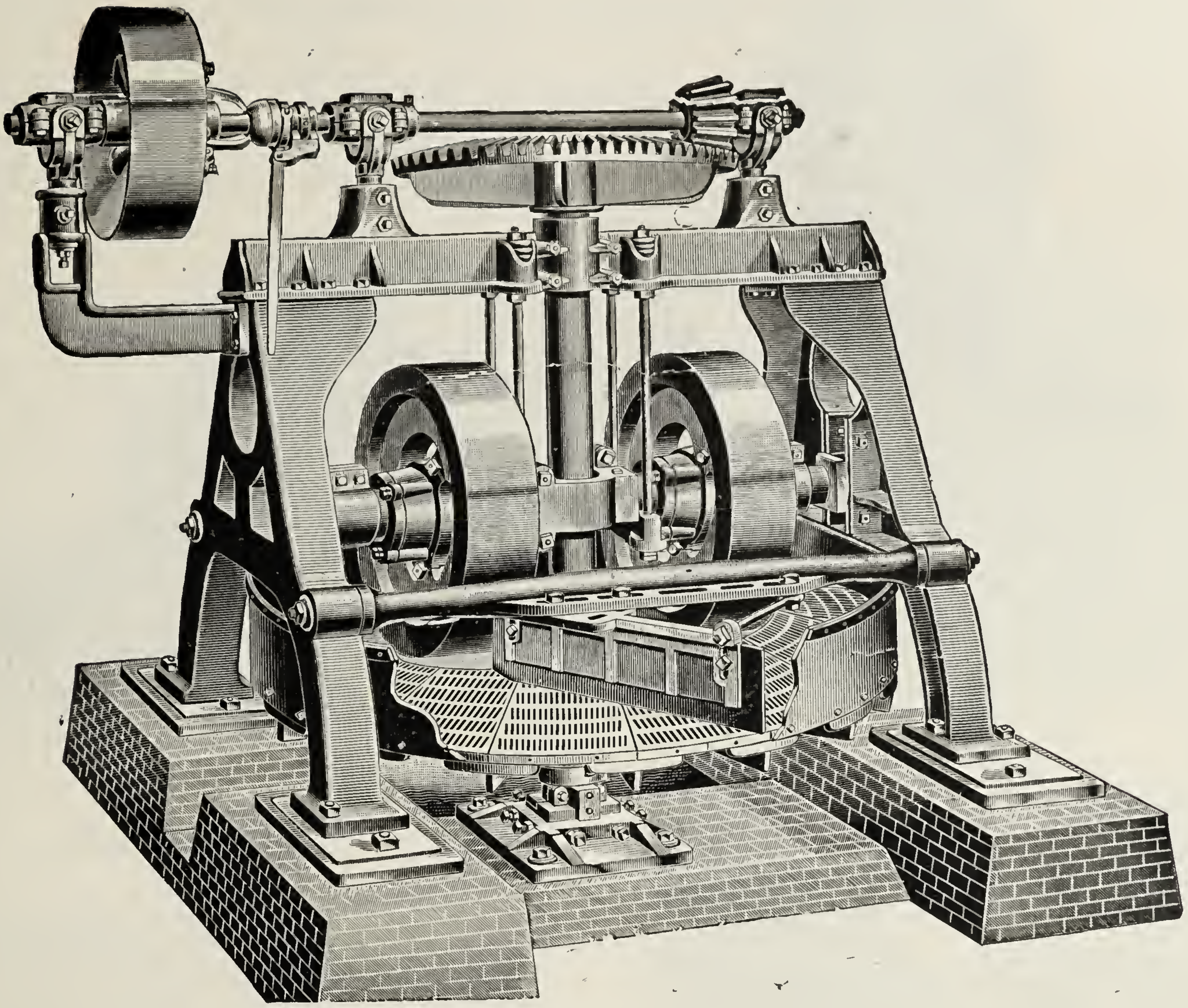


IN 1898 MORE EAGLES WERE SOLD THAN IN ANY PREVIOUS YEAR AND MORE THAN ALL OTHER MAKES COMBINED. THE EAGLE IS THE POPULAR PRESS.

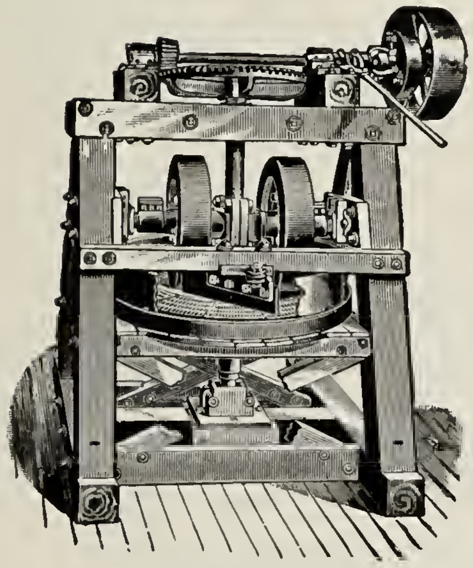
Our new Dryer Catalogue has just been issued. Send for a copy.

The Machinery that Never Disappoints.

The American Clay-Working Machinery Co.,
BUCYRUS, OHIO, U. S. A.

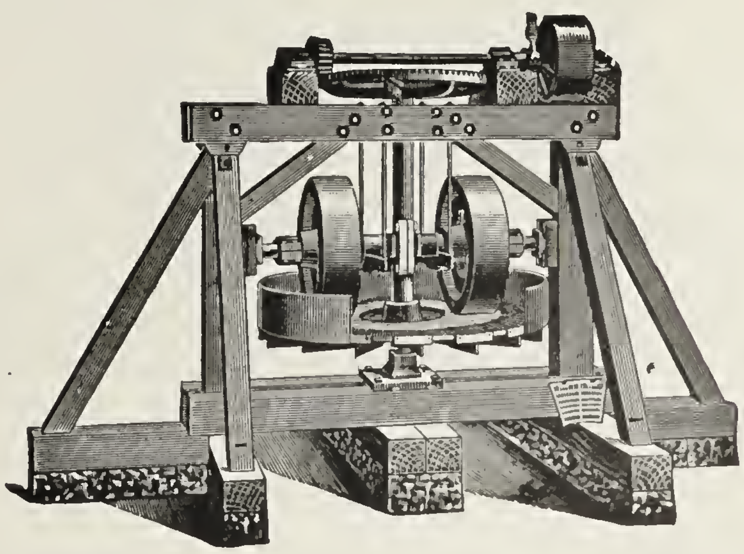


OUR SPECIALTY IS **DRY PANS.**



IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



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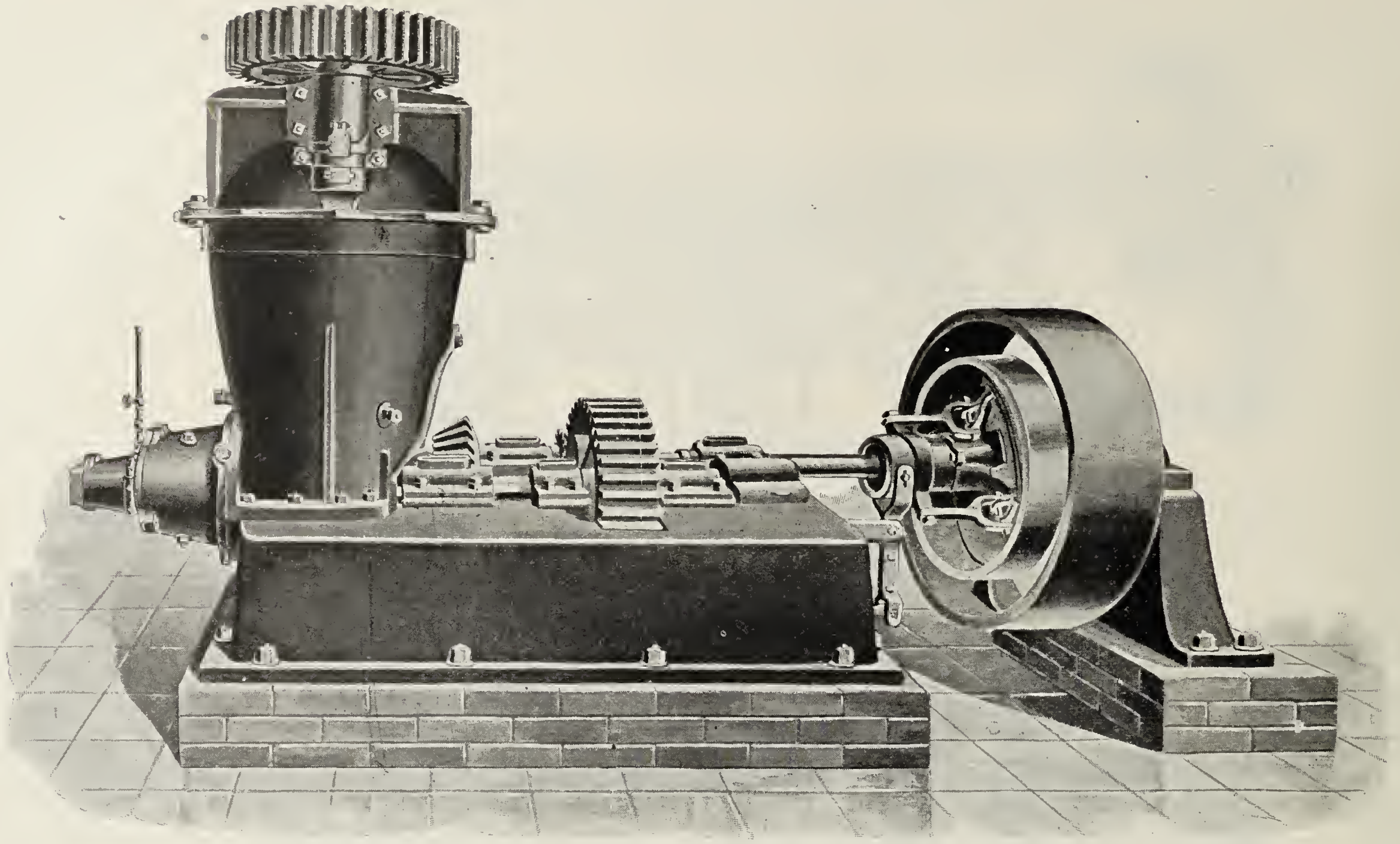
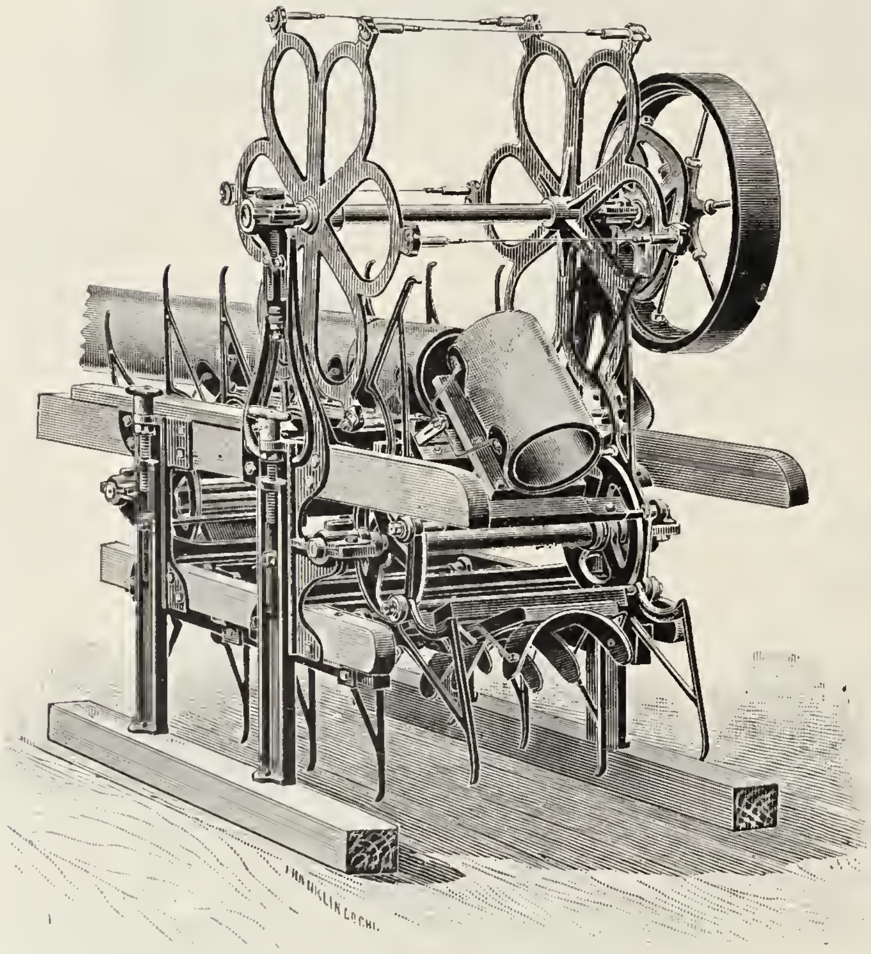
FROST ENGINE CO., Galesburg, Ill.,
U. S. A.



Brewer No. 10. Daily capacity 50,000 to 80,000 Brick.



Automatic Tile Cutter.

Naperville, Ill., Jan. 24, 1898.

H. BREWER & CO., Tecumseh, Mich.:

Dear Sirs—In answer to your inquiry, it gives us great pleasure to say that your Automatic Tile Cutter we bought about one year ago, along with the No. 9 A machine, is ALL RIGHT, just as you represented it. With it we have been able to put from 15,000 to 18,000 three-inch tile on the floor in 10 hours. The tile are cut true; very few have to be thrown back. There is no doubling up of tile in the troughs when clay runs a little softer than it ought to be; the little belt which drives the reel prevents this and helps to keep the troughs moving. The pressure on the cutting wires being always in the same direction, makes them last a long time. Clay can also be run quite soft and the tile retain their perfect form. We think your Automatic Tile Cutter is nearly perfection. We are well satisfied with it and could not think now of running our works again without it. Wishing you much success, we remain

Yours truly,

MARTIN & VONOVEN.

H. BREWER & CO.,

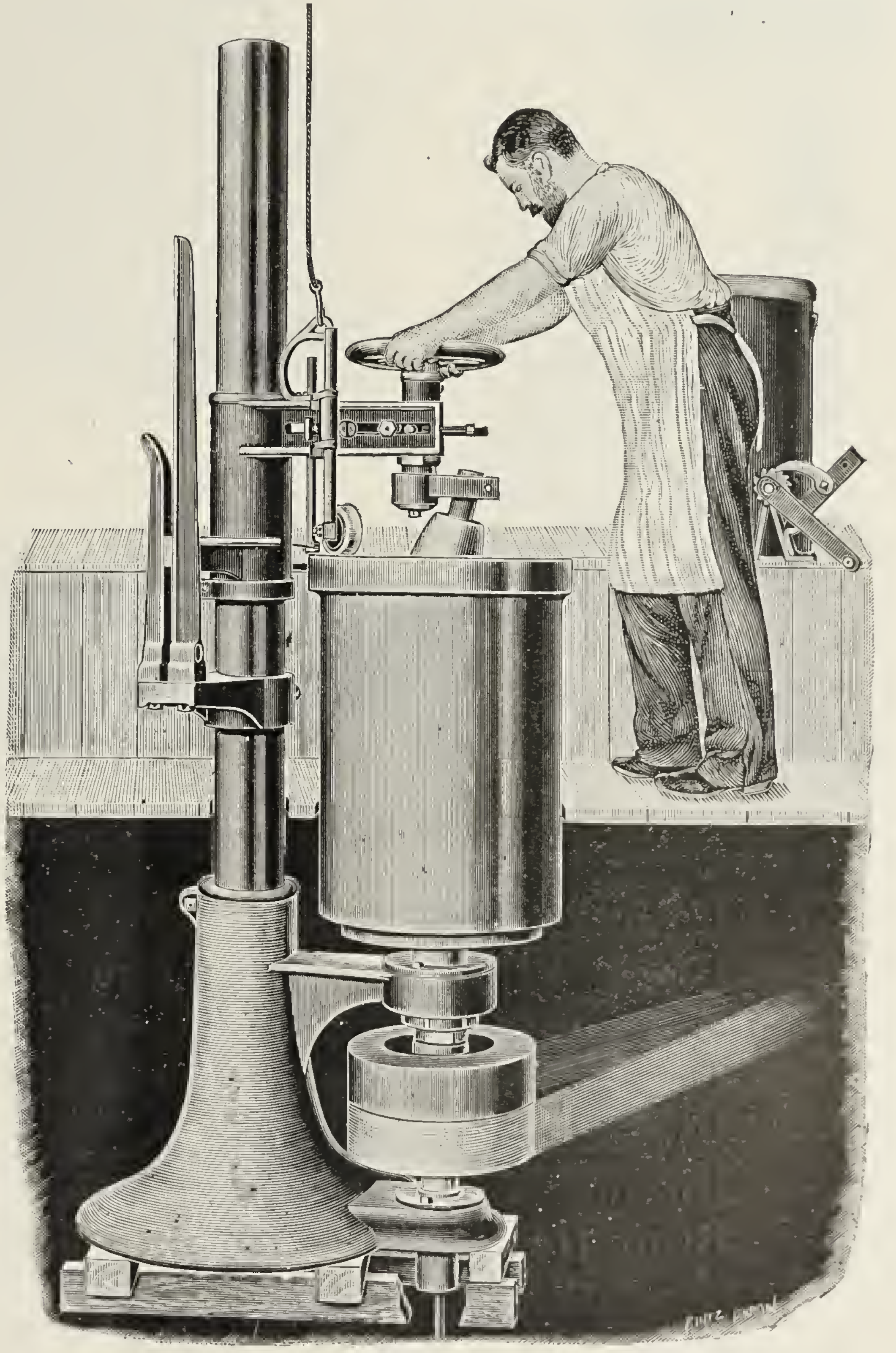
Tecumseh, Mich.

The BEST

Large Pottery Ware MACHINE ON EARTH.

RANGE 6 TO 60 GALLONS.
80—30 GALLON TUBS MADE IN 10 HOURS.

ALWAYS IN ADVANCE
READY TO MEET YOUR REQUIREMENTS.



Our Reputation for
Superior Machinery
AND
Fair Dealing
IS WELL
Established
....AND....
Will be Maintained.

WRITE US FOR...
CUTS and DESCRIPTION
...OF...

**POTTERY,
SEWER PIPE AND
DRAIN TILE
MACHINERY.**

TAPLIN, RICE & CO., AKRON, OHIO, U. S. A.

STEVENSON & CO.,

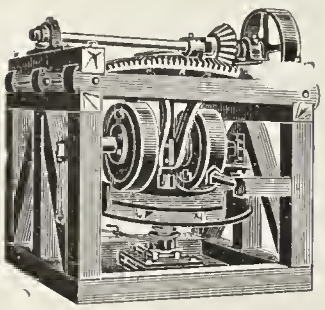
WELLSVILLE,
OHIO, U. S. A.

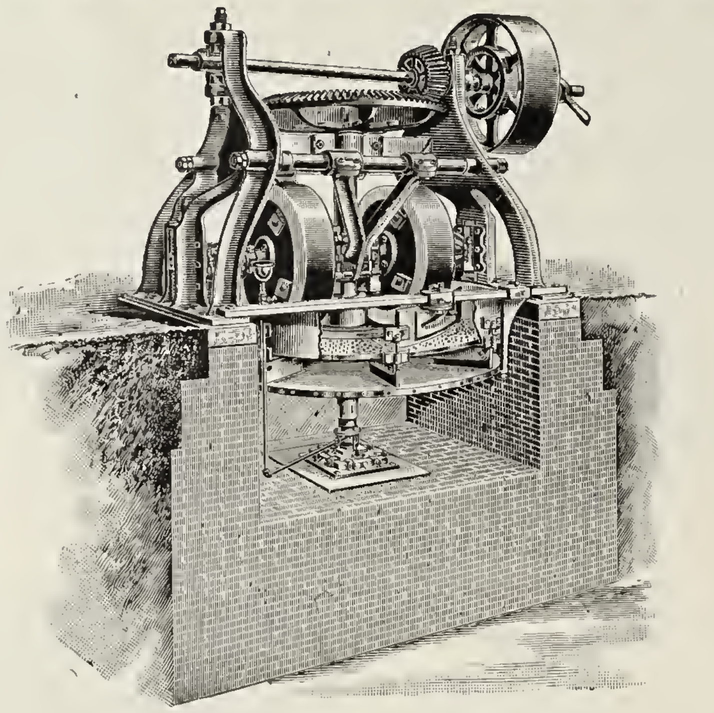
MANUFACTURERS OF

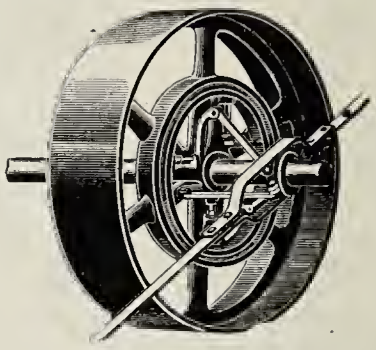
Brick Machinery.

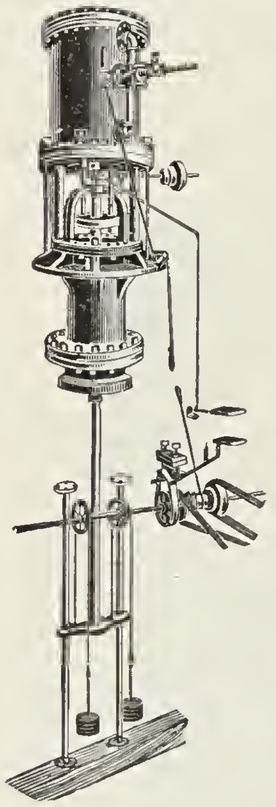
COMPLETE EQUIPMENTS.

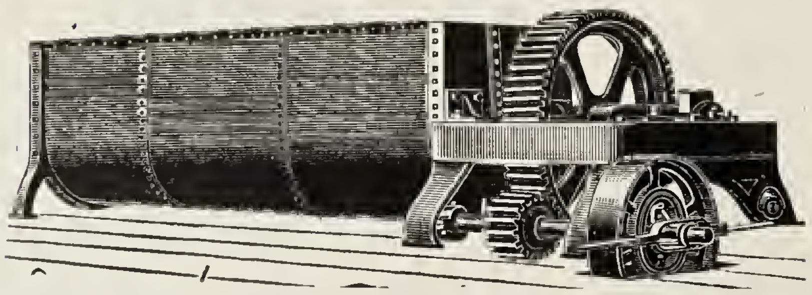
Tile Machinery

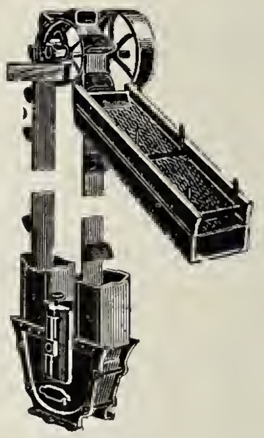












Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

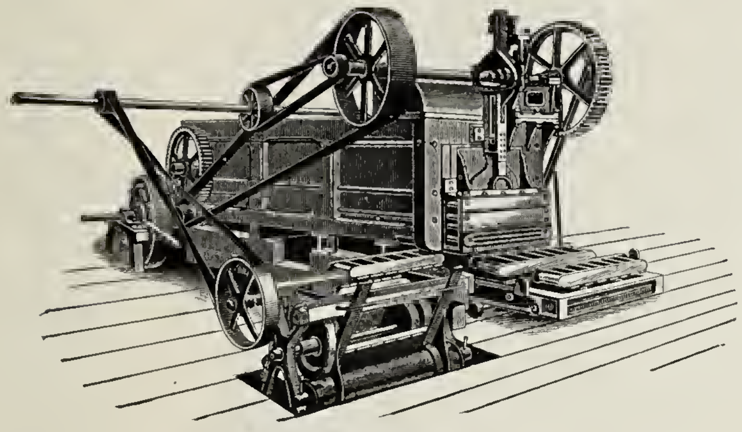
STEVENSON & CO., Wellsville, Ohio.

DON'T

Buy inferior machinery because it is cheap, for if you wish to attain the highest possible degree of success in your business, it will pay you to buy the best, namely,

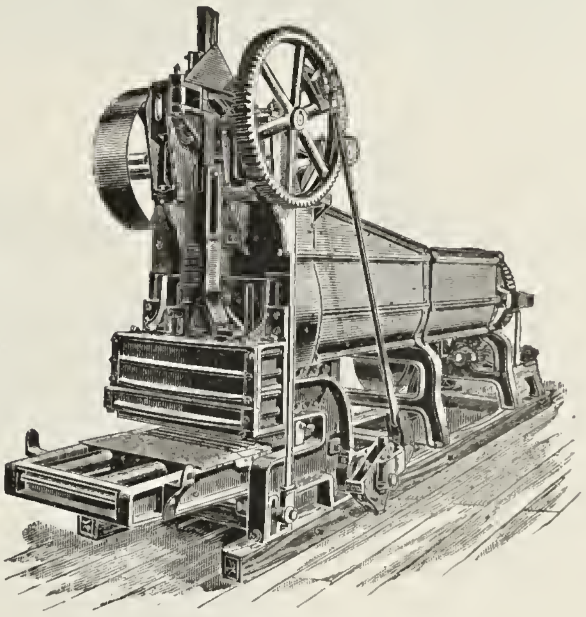
··THE··
POTTS Horizontal Stock Brick Machine

They do all Claimed for Them. You take no chances of an Experiment.



Wood Pug Mill.

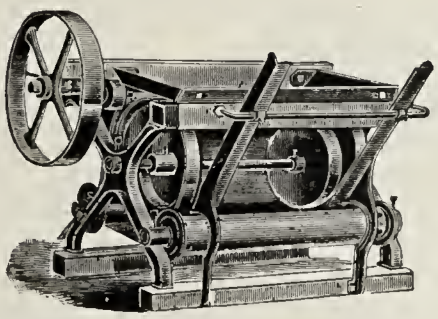
They have no equal for making Brick which have Clean, Sharp Corners and Smooth Surfaces.



Iron Frame Pug Mill.

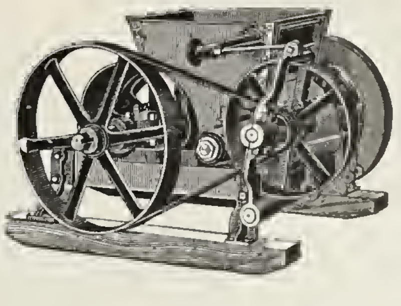
They are the only machines which will work the clay direct from the bank without the use of an extra Pug Mill.

They are **Simple in Construction, Strong and Durable.** Every machine guaranteed to do as claimed for it.



Mould Sanders,

Which have no equal for sanding the moulds, no light complicated parts to wear or break. They do not waste or spill the sand. Guaranteed to do all claimed for them.



Disintegrators,

Built of good material, strong and durable. They do the work claimed for them, built in a number of sizes to suit any yard.

For terms and prices of anything needed on the brickyard write

C. & A. POTTS & CO., 814 to 824 W. Wash. St., INDIANAPOLIS, IND.

We Lead! Others Follow!

• • •

The Hercules!

Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

The Standard Machine is just what its name implies.

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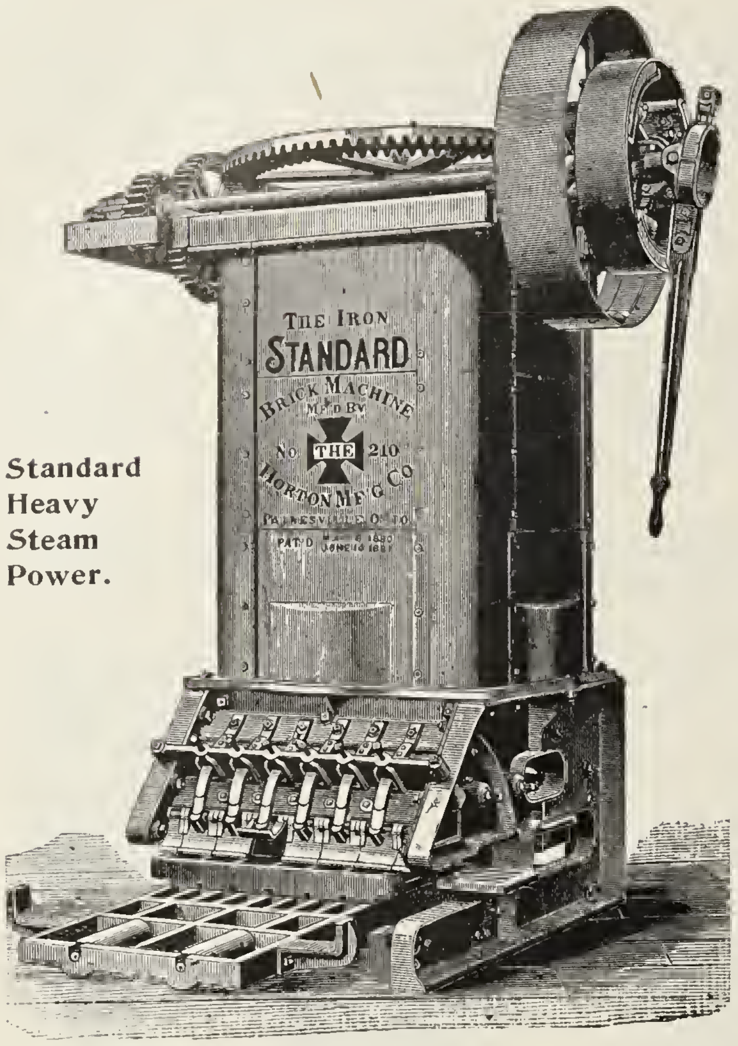
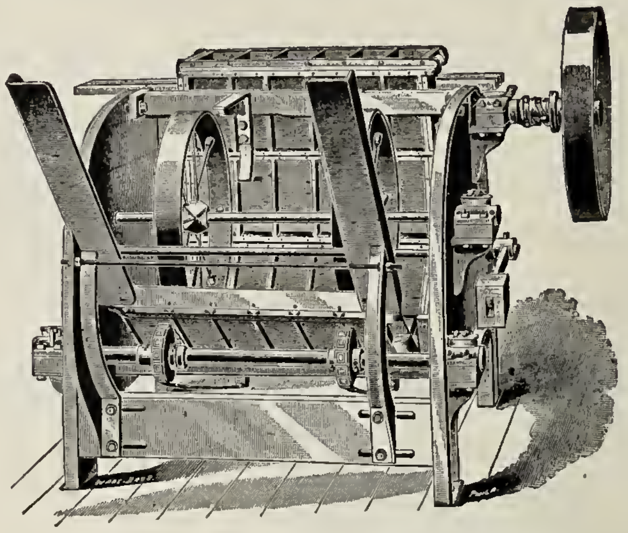
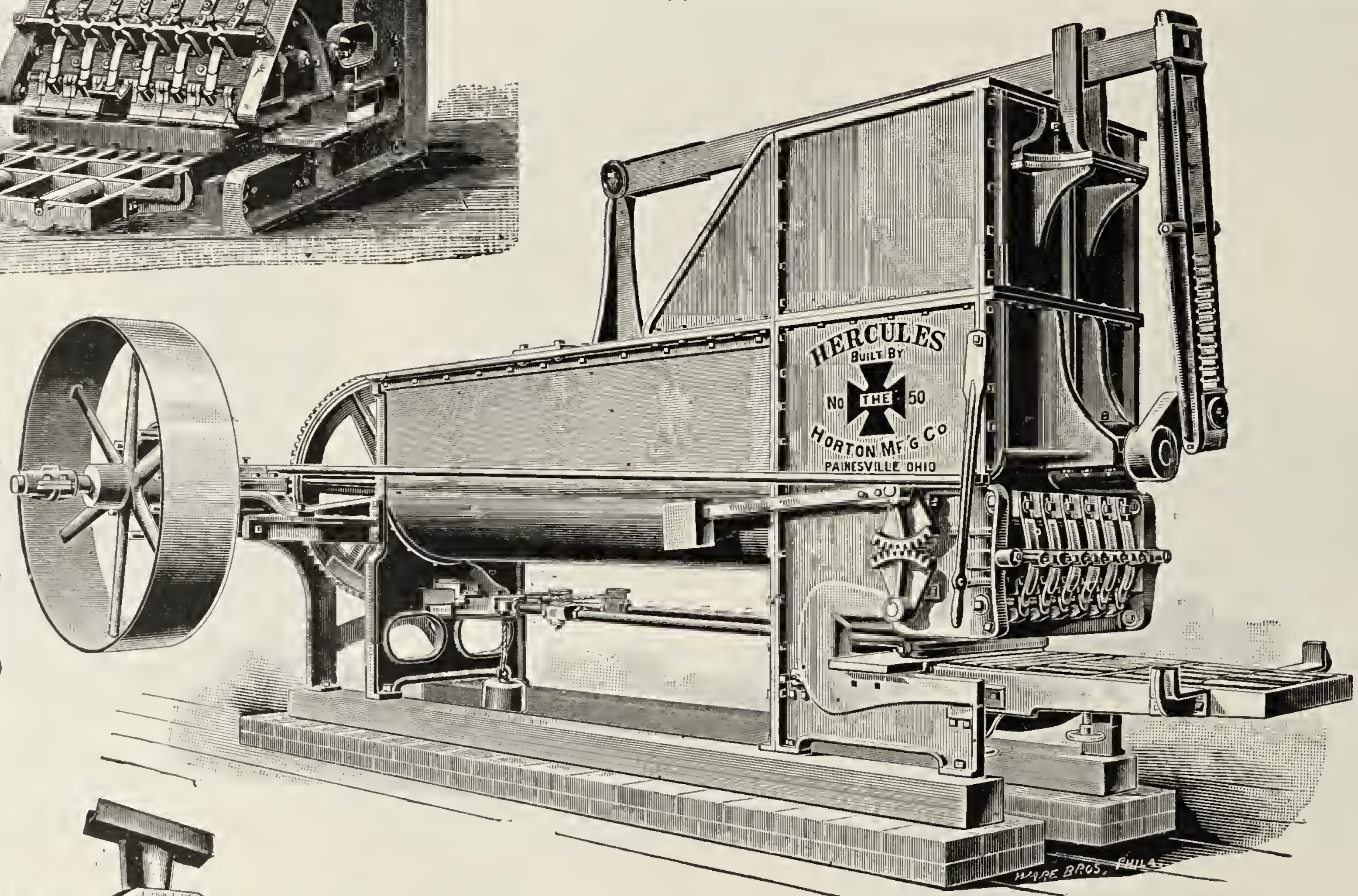


Standard
Heavy
Steam
Power.

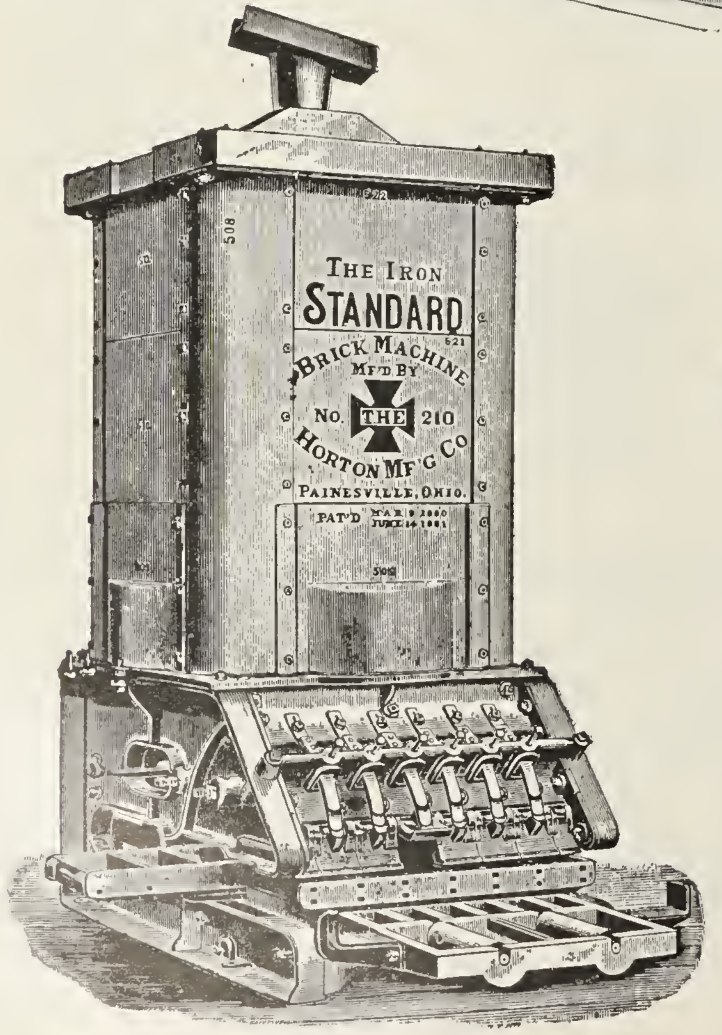

HORTON MOLD SANDER DIRECT FEED.



Hercules capacity 40,000
to 50,000.
Weight 15,000 pounds.

We are making a special drive on Molds this season. Send for our new circular on molds

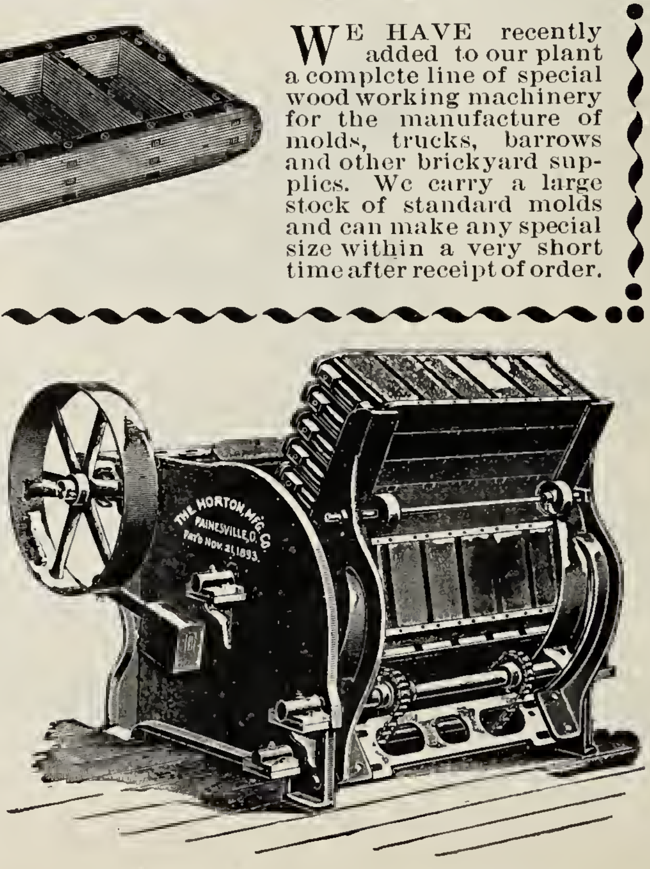
We HAVE recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.



IRON STANDARD HORSE POWER.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE,
OHIO.


The Horton Mf'g Co.
Painesville, O.
Pat'd Nov. 21, 1893.

THE AUTOMATIC FEED MOLD SANDER.

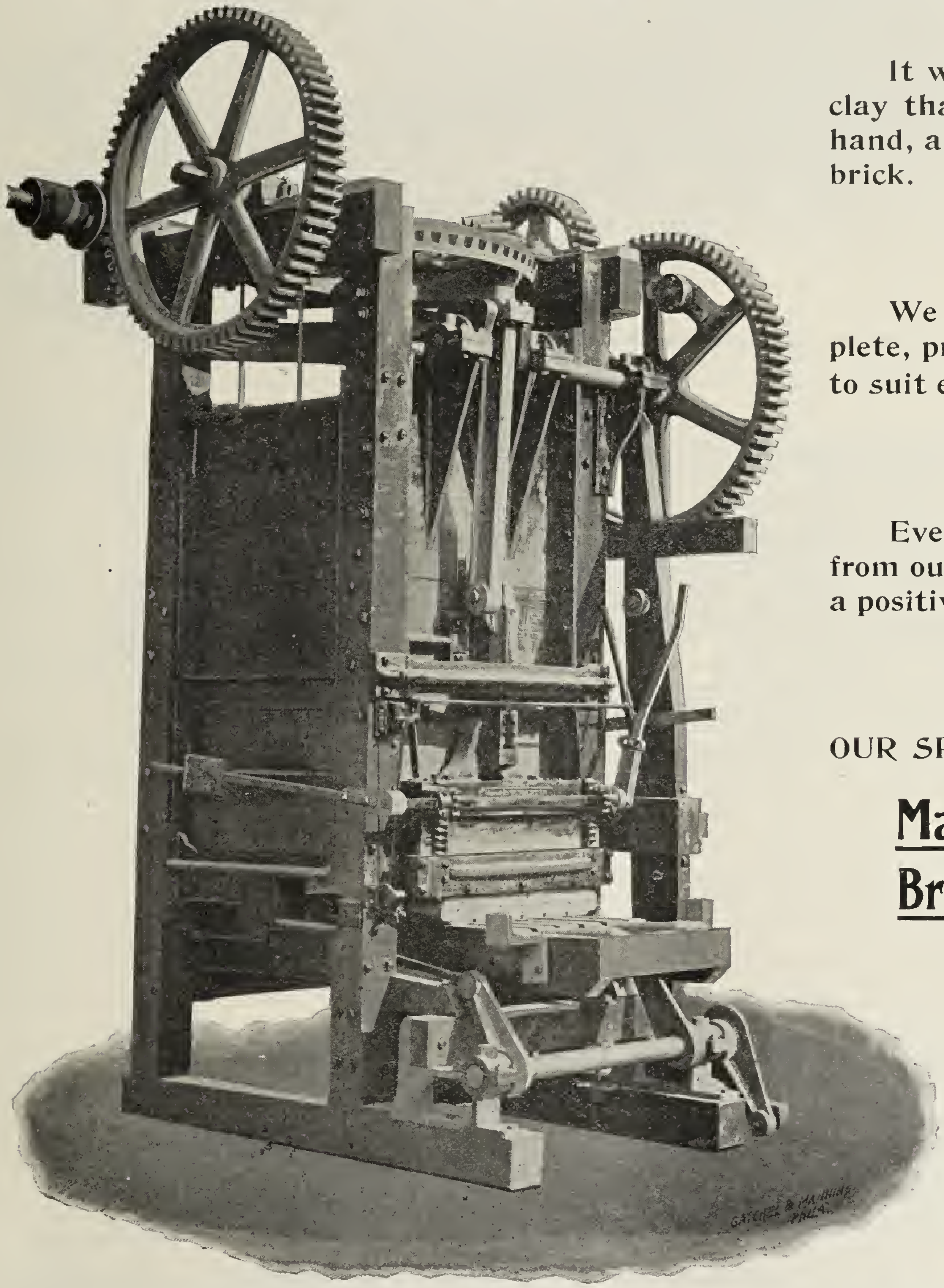
1857-1899.

THE

"Martin" Brick Machinery

STANDS UNEQUALLED FOR

Simplicity, Strength and Durability.



It will work any kind of clay that can be worked by hand, and turn out a perfect brick.

* * *

We equip plants complete, preparing special plans to suit each need.

* * *

Every machine shipped from our factory is sold under a positive guarantee.

* * *

OUR SPECIALTY

Machine
Brick Moulds.

* * *

All Inquiries
have prompt
and careful
attention.

* * *

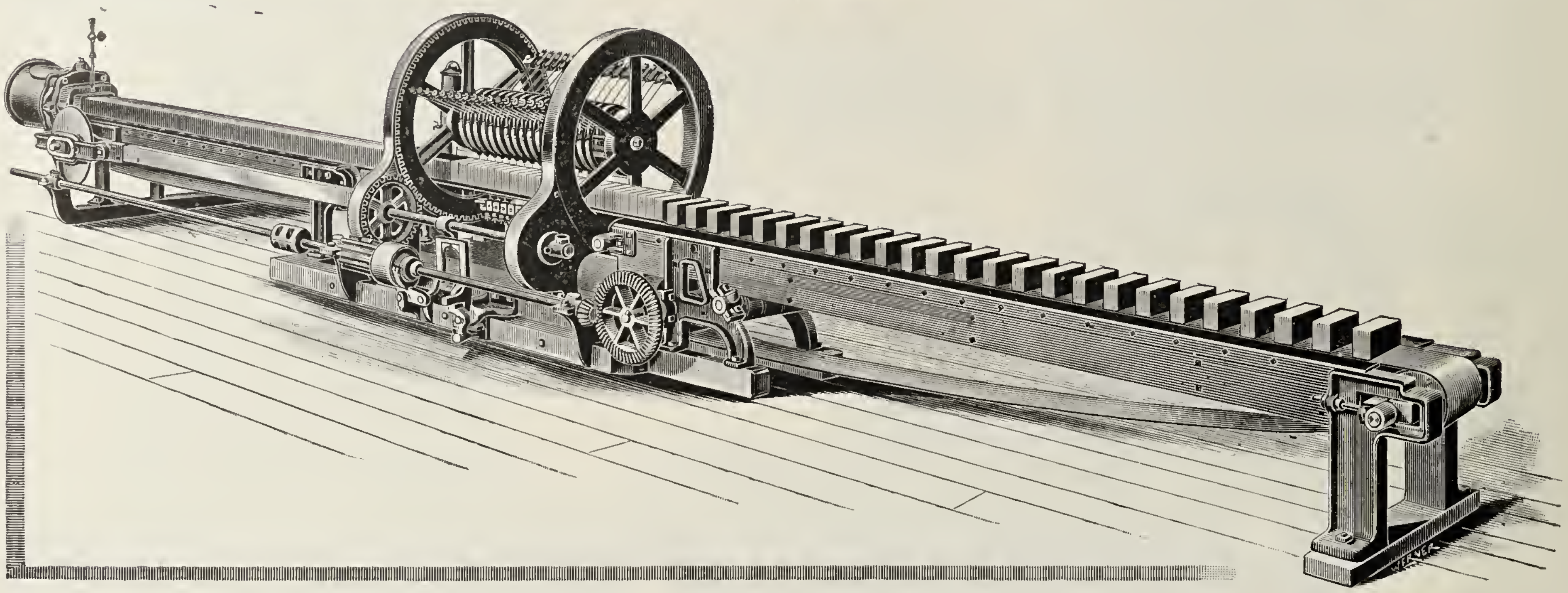
Send for General Catalogue. Mentioning anything you need.

THE HENRY MARTIN BRICK MACHINE MFG. CO.,

INCORPORATED. LANCASTER, PA., U. S. A.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



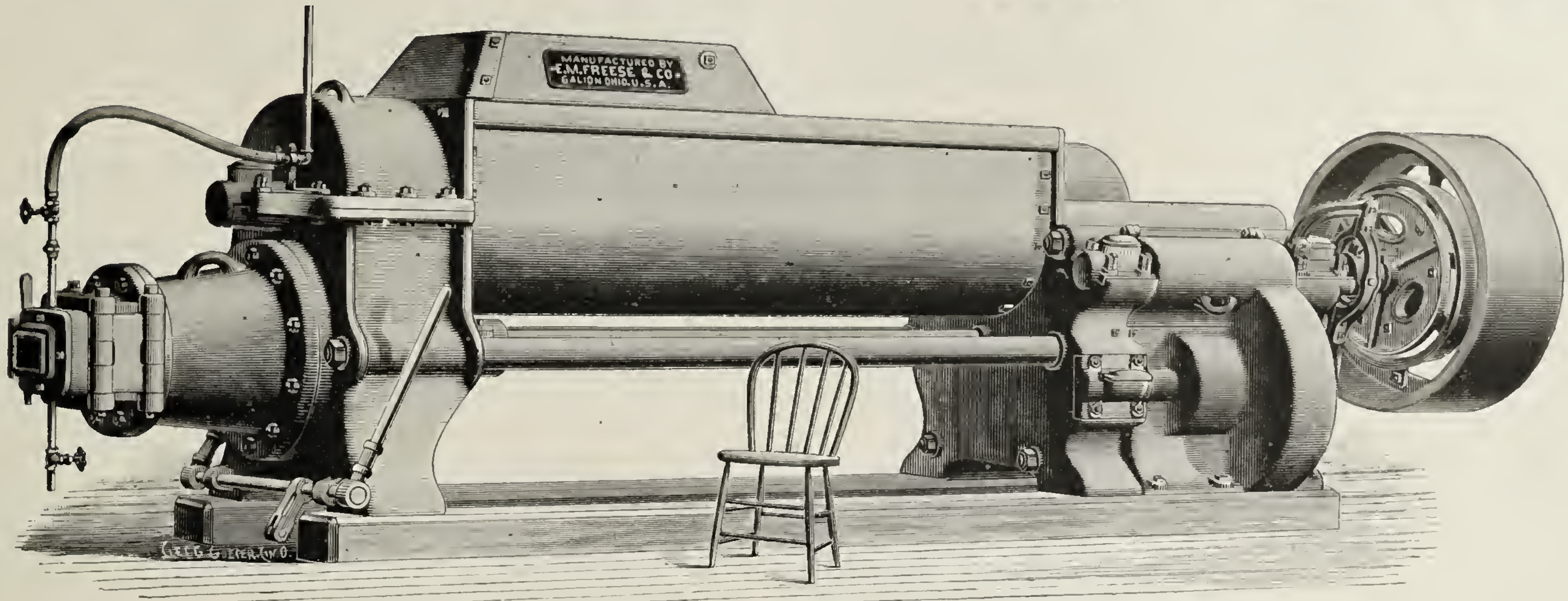
A New Rotating Cutter for Side Cut Brick.

POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick.
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

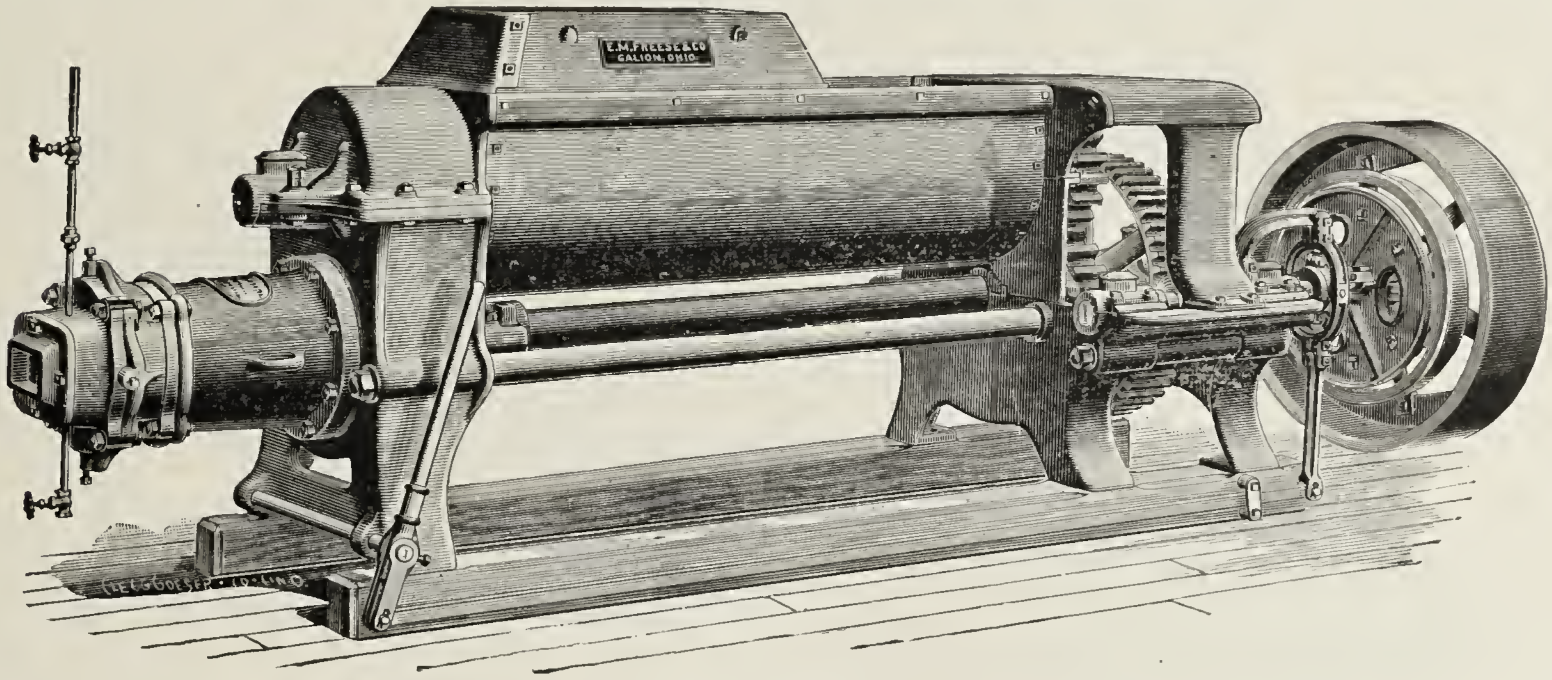
E. M. FREESE & CO.,
Galion, Ohio.

The Original Union Brick Machines


MANUFACTURED BY
E.M.FREESE & CO.
GALION OHIO U.S.A.

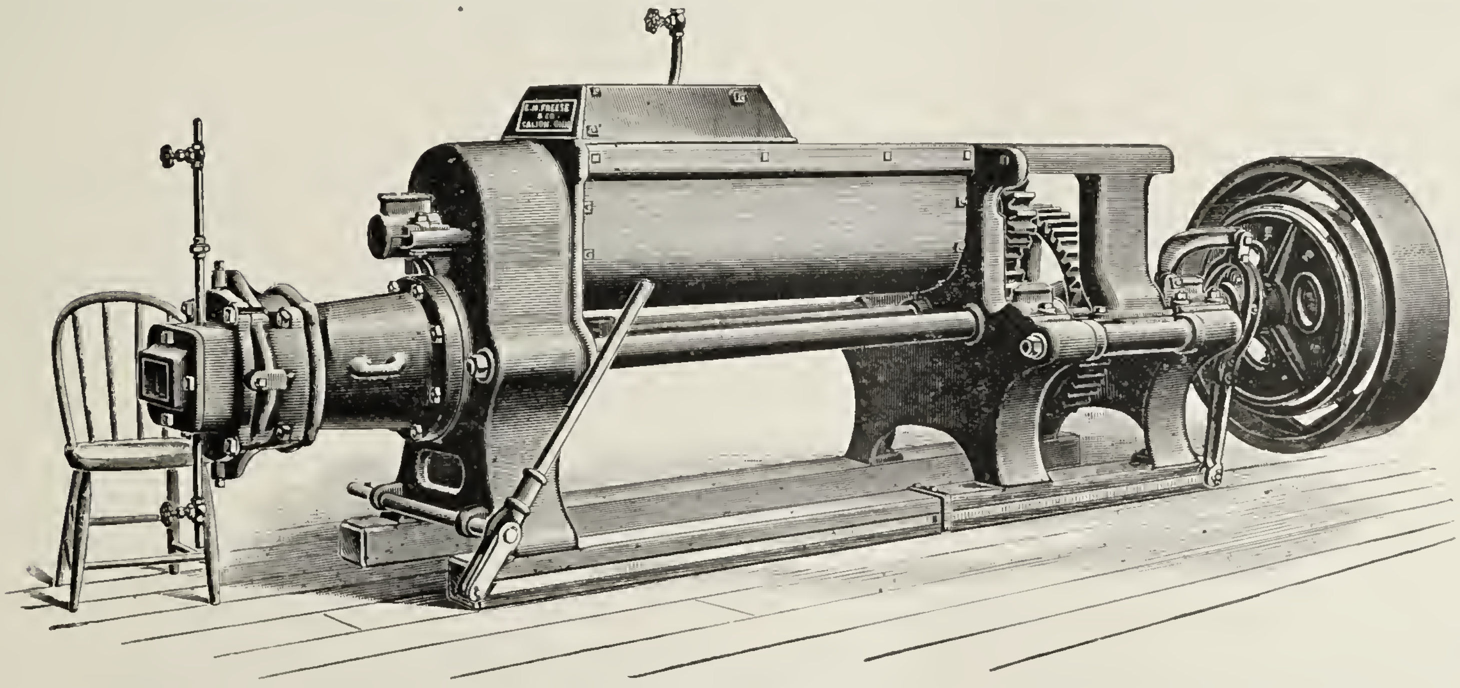
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

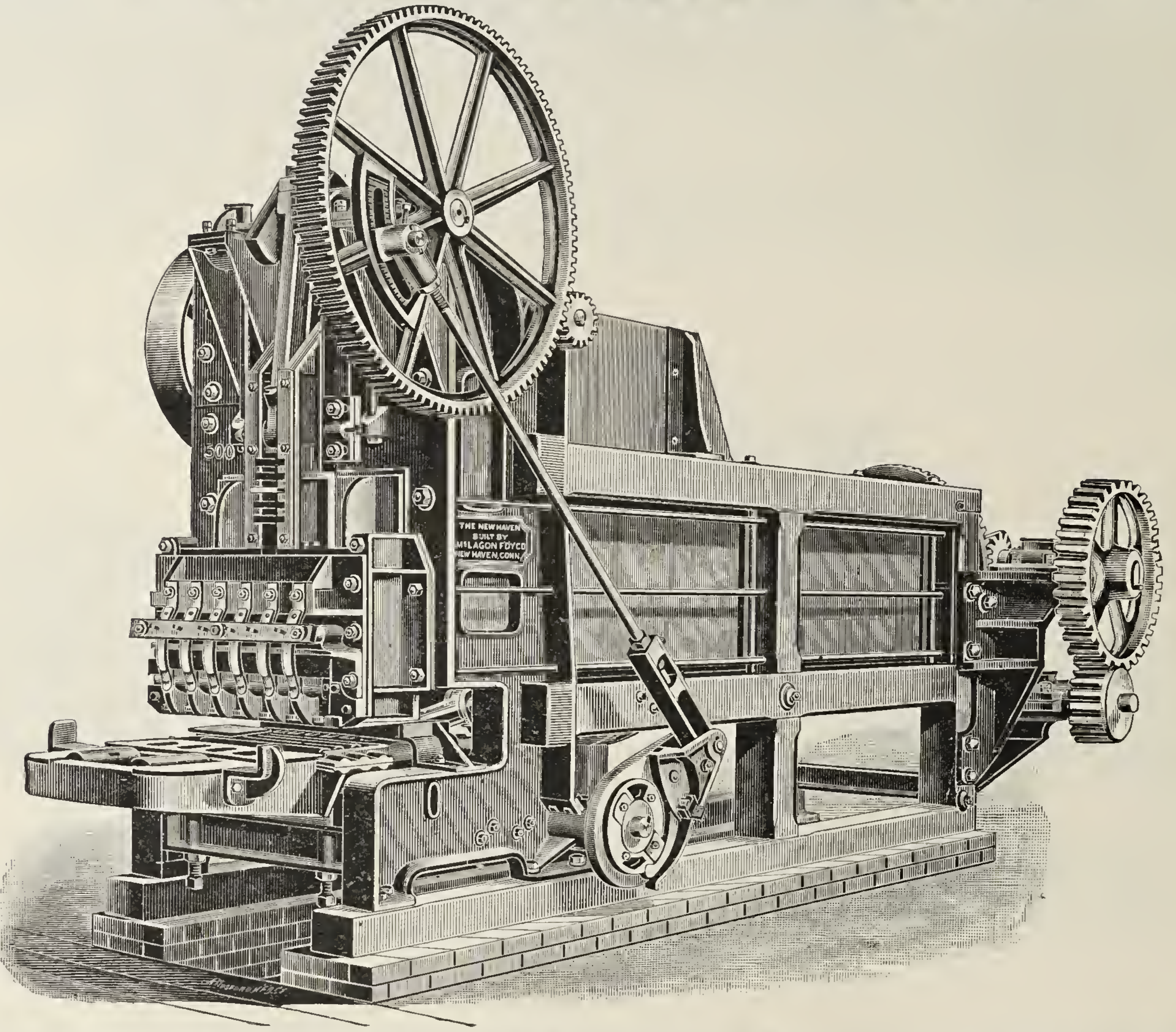
No separate Pug Mill required.

E. M. FREESE & CO., Galion, Ohio.

AFTER ELEVEN MONTHS....
AND MAKING NEARLY NINE MILLIONS OF BRICK.

So Well Pleased

They Have Bought Another.



MECHANICVILLE, N. Y., Oct. 17, 1898.

THE EASTERN MACHINERY CO., New Haven, Conn.

Gentlemen—The machine we purchased of you last season has proven very satisfactory, and, while we cannot say that we have not paid out anything for repairs, yet we can say that **since November 3, 1897**, when we started the machine, **to the present date, we have made nearly nine millions of brick on this one machine**, and have had **no heavy bill of repairs** and **hardly lost any time** on account of the machine.

If there is any better machine made than yours we have not seen it.

Yours very truly, BEST BRICK CO.,
Per W. N. CAREY, Sec'y.

We Aim to Satisfy Every Patron.

The Eastern Machinery Co.,

NEW HAVEN, CONN.

DO YOU WANT THE

BEST BRICK DRYER?

THE CUMMER DRYERS

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel. It is a fuel saver and hence a money maker.

If you want the best and most economical brick dryer don't fail to get our prices. If you want a cheap dryer, its no use to write us for we don't build that kind.

◆

Read what H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE: 60TH AND HAVERFORD STS. TELEPHONE 147, W. P.

H. C. CARROLL & SONS,

Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS:
57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

◆

The Cummer Clay Dryer is now in successful operation at many places in the United States. Like our brick dryer it is fully guaranteed to perform its work in the most effective manner possible and in any desired capacity. The **Cummer Dryer** succeeds where others fail. It will afford us pleasure to demonstrate its superiority over all other dryers.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell you troubles to"

The F. D. CUMMER & SON CO.,

CLEVELAND, OHIO.

The "A. B. C." Brick Dryer

AMERICAN BLOWER CO
HEATING & VENTILATING ENGINEERS
MANUFACTURERS OF FANS · BLOWERS HOT-BLAST APPARATUS ENGINES
NEW YORK
DETROIT
LONDON

Send for Catalogue, and Write us about Your Difficulties; we can help you.

Accomplishes Results Where all Others Fail.

Read what the CHATTAHOOCHEE BRICK CO., Atlanta, Ga., say. What we have done for them, we can do for you.

Atlanta, Ga., May 3rd, '99

AMERICAN BLOWER Co., Detroit, Mich.

Gentlemen:—Answering your favor of the 1st, inst., will say that the brick dryer which you installed for us has now been in constant operation for about two months, a large part of the time during the worst kind of weather for drying, it having rained almost continually for three weeks, but in spite of this and other obstacles, we find that your guarantee to dry 100,000 brick per day, has been more than fulfilled, and we are making and drying the brick at a cost for fuel of less than 30 cents per thousand, coal costing us $1.90 per ton.

As your dryer was put in to replace one of another make, which never more than half fulfilled the guarantee made for it, we have reason to feel highly pleased with the work you have accomplished, and have no reason to regret our decision in selecting your dryer.

Yours very truly,
CHATTAHOOCHEE BRICK Co.,
By J. W. English, President.

American Blower Company,
DETROIT, MICH.

The Peerless System

UP-DRAFT, DOWN-DRAFT and CONTINUOUS KILNS

Is the Acme of Perfection in Brick Burning.

Read What They Say About It.

LaPRAIRIE PRESSED BRICK AND TERRA COTTA CO., Quebec.

"We have been using two of these rebuilt Kilns for the last two years, and the fact that we are now reconstructing another, DEMONSTRATES our ENTIRE SATISFACTION WITH YOUR PEERLESS SYSTEM."

ELMSDALE BRICK CO., N. S.

"Never saw a Kiln work so EVEN and FREE both in watersmoking and burning in all my life. The arches WERE AS GOOD as any other part of the Kiln."

JOHN CUBBINS SONS, Memphis, Tenn.

"After burning the first kiln that was changed, the second time, WE FOUND THE IMPROVEMENT SO GREAT and SO MUCH SUPERIOR to the old up-draft Kilns, that we are now changing our entire system to your PEERLESS PATENT."

JACOB KLINE, Baltimore, Md.

"Your system of burning GOOD HARD BRICK is without doubt THE BEST I have ever seen."

And There are Others.

No matter what you manufacture, or the capacity of your plant, if you make is of clay and want it burned write us for information. If you have kilns that are not giving satisfaction, or from any other cause you cannot burn your ware, write and tell us all you know about the trouble.

J. W. CARSON, Construction Engineer of Brick Works. **LaPrairie, P. Q.**

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A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS.
INCLUDING BRICK TILE TERRA-COTTA SEWER PIPE POTTERY ETC.
T. A. RANDALL & CO. PUBLISHERS.
CHANDLER SC. INDPLS.

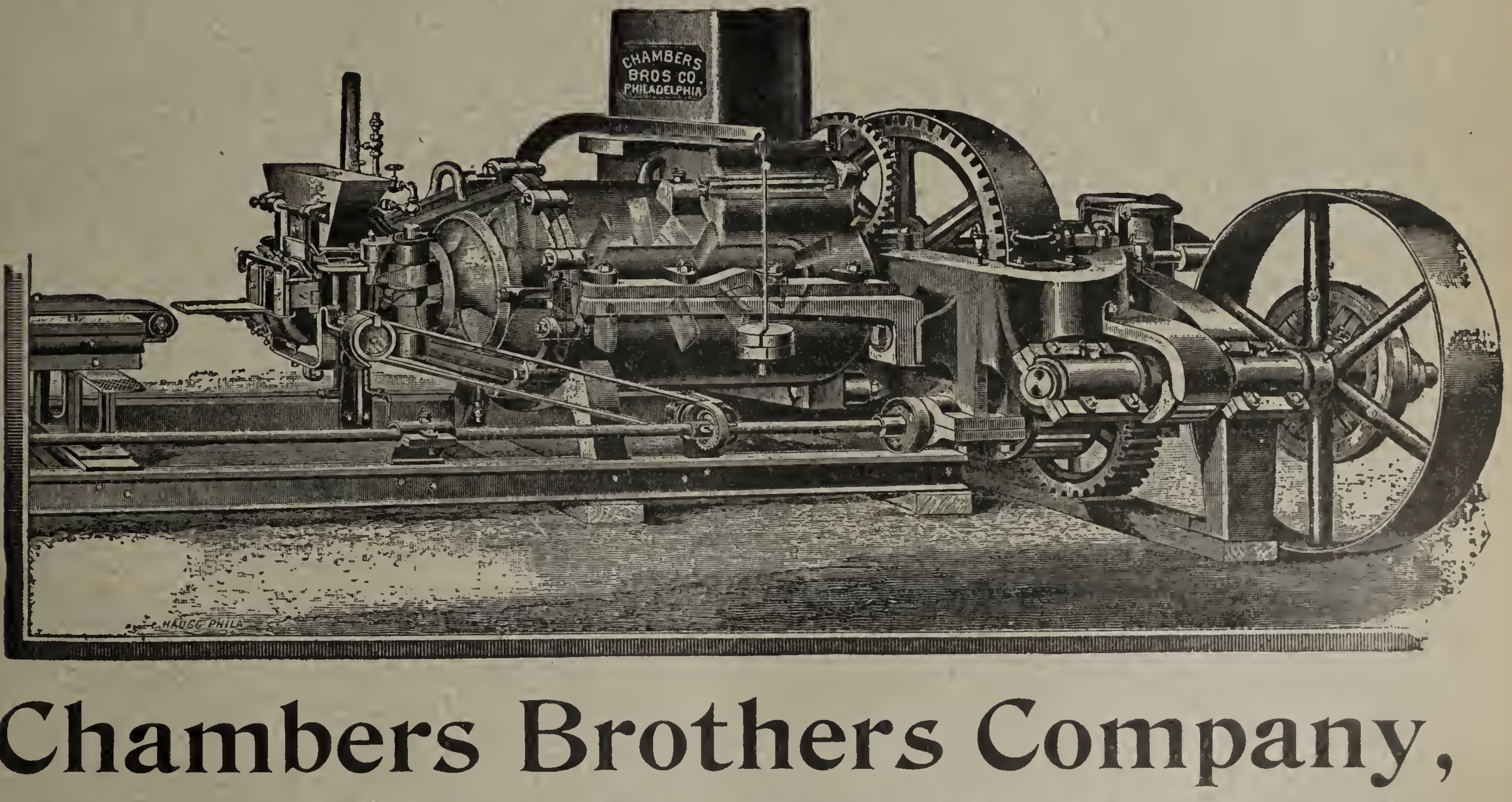
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXI, No. 6. INDIANAPOLIS, IND., JUNE, 1899. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



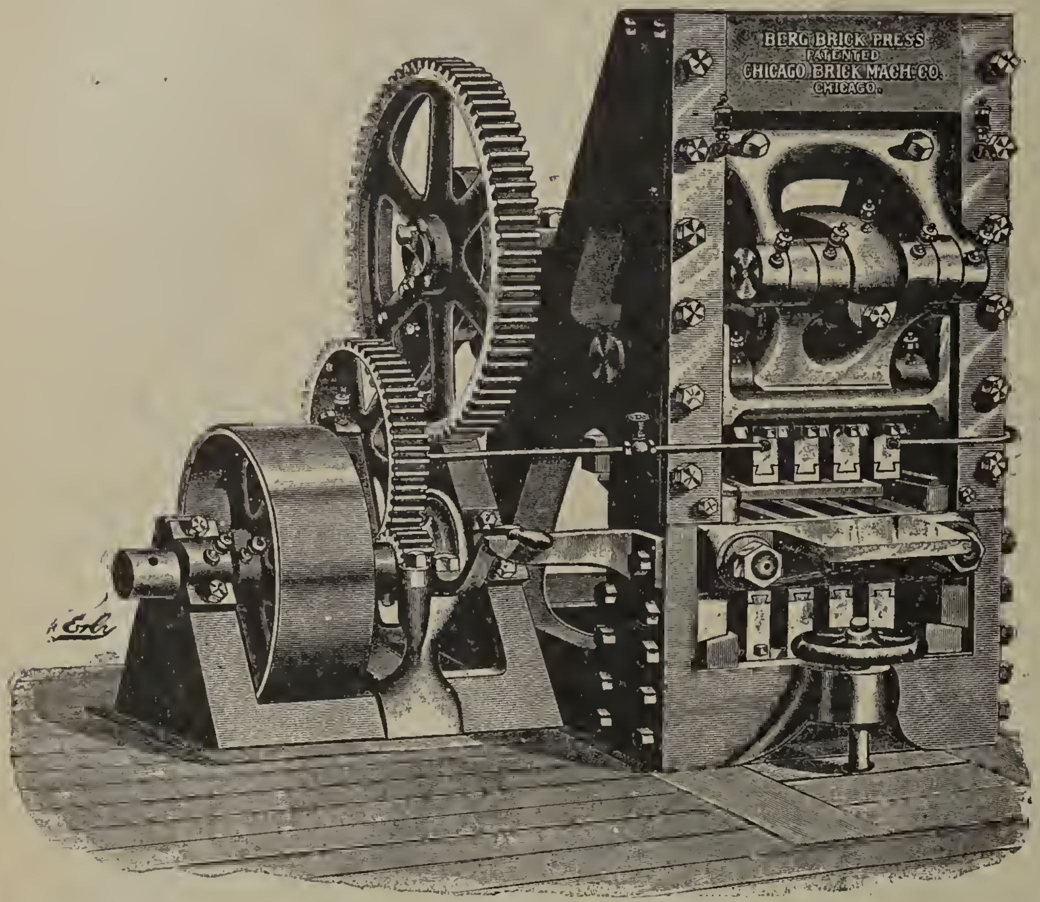
Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

Up-to-Date Machinery.



OUR **BERG BRICK PRESS** is the Most Modern in design and construction of all Dry Press Machines. Simplest, Strongest and most Durable.

It has three distinct pressures and an unequalled Mold Box. Absolutely unbreakable and fully guaranteed. Circular on application.

Our line of **Stiff Clay** and **Soft Clay Machinery** is also strictly **Up-to-Date.** All the latest improvements and most convenient devices.

Send for new 1899 catalogues.

CHICAGO BRICK MACHINERY CO.,

225 DEARBORN STREET.

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The MONARCH

Is an All Iron and Steel Brick Machine with

Double Pug Mill.

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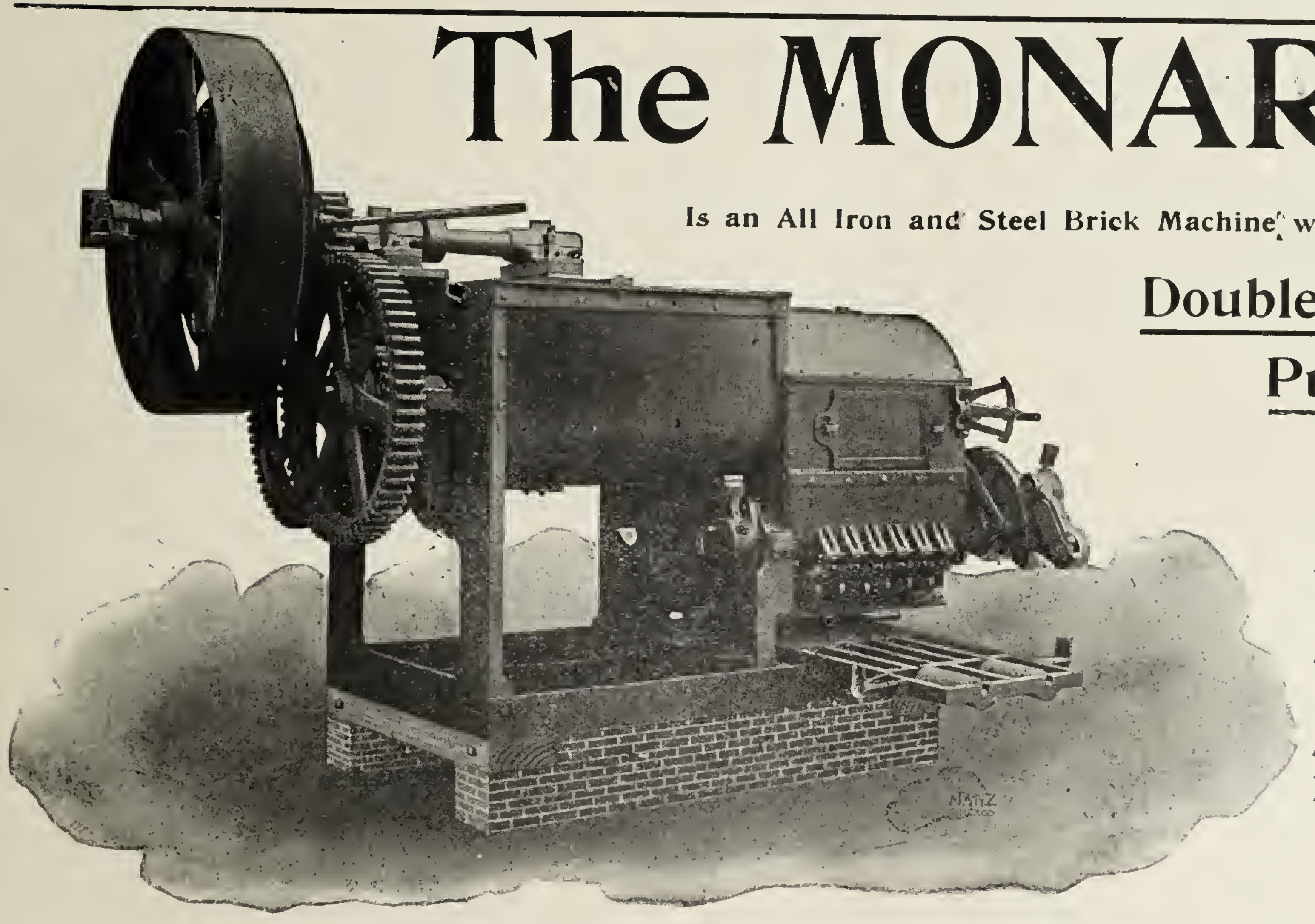
SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

• • •

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for 1899 Catalogue.

JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.



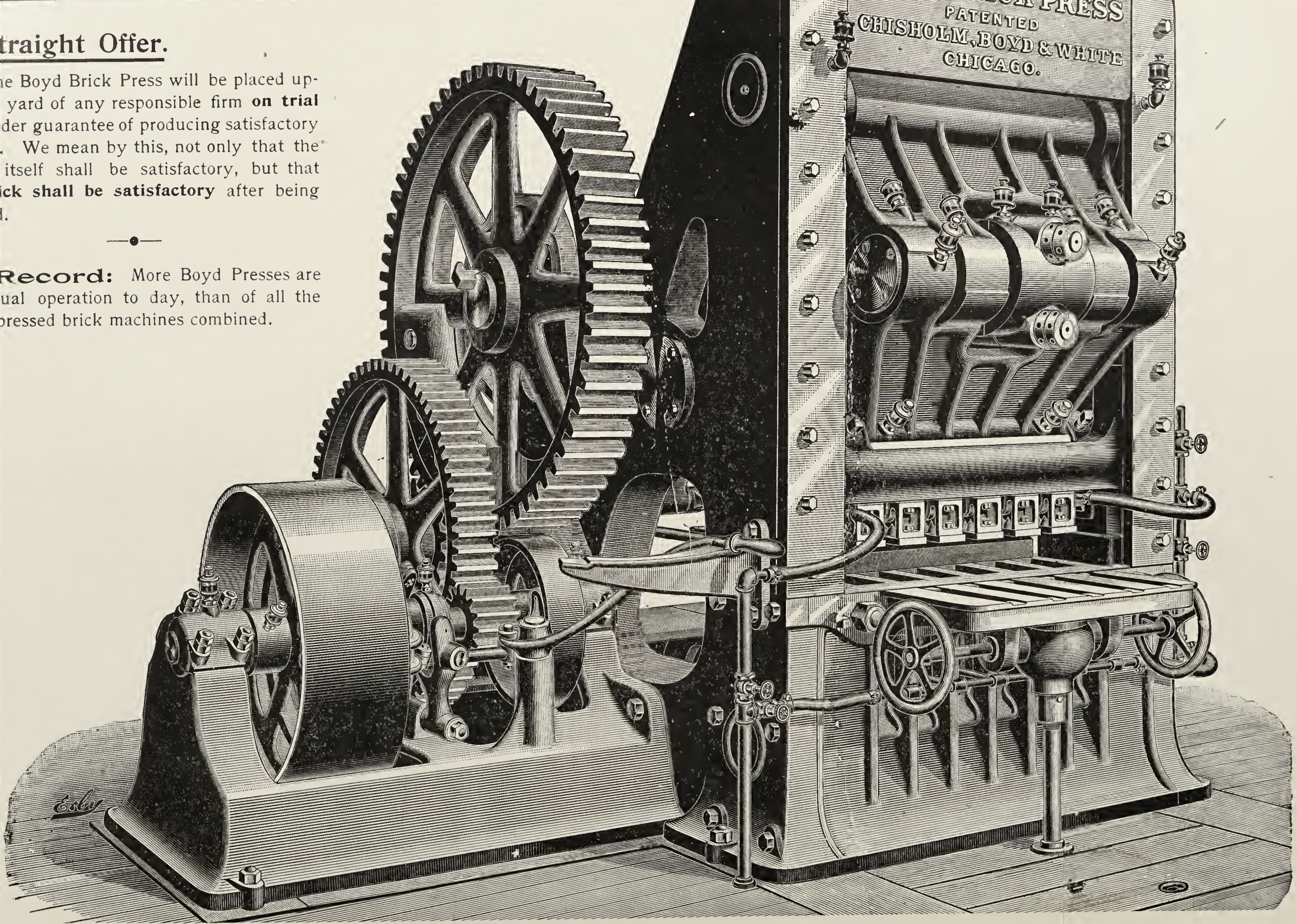
America's Greatest Brick Machine

A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

—•—

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

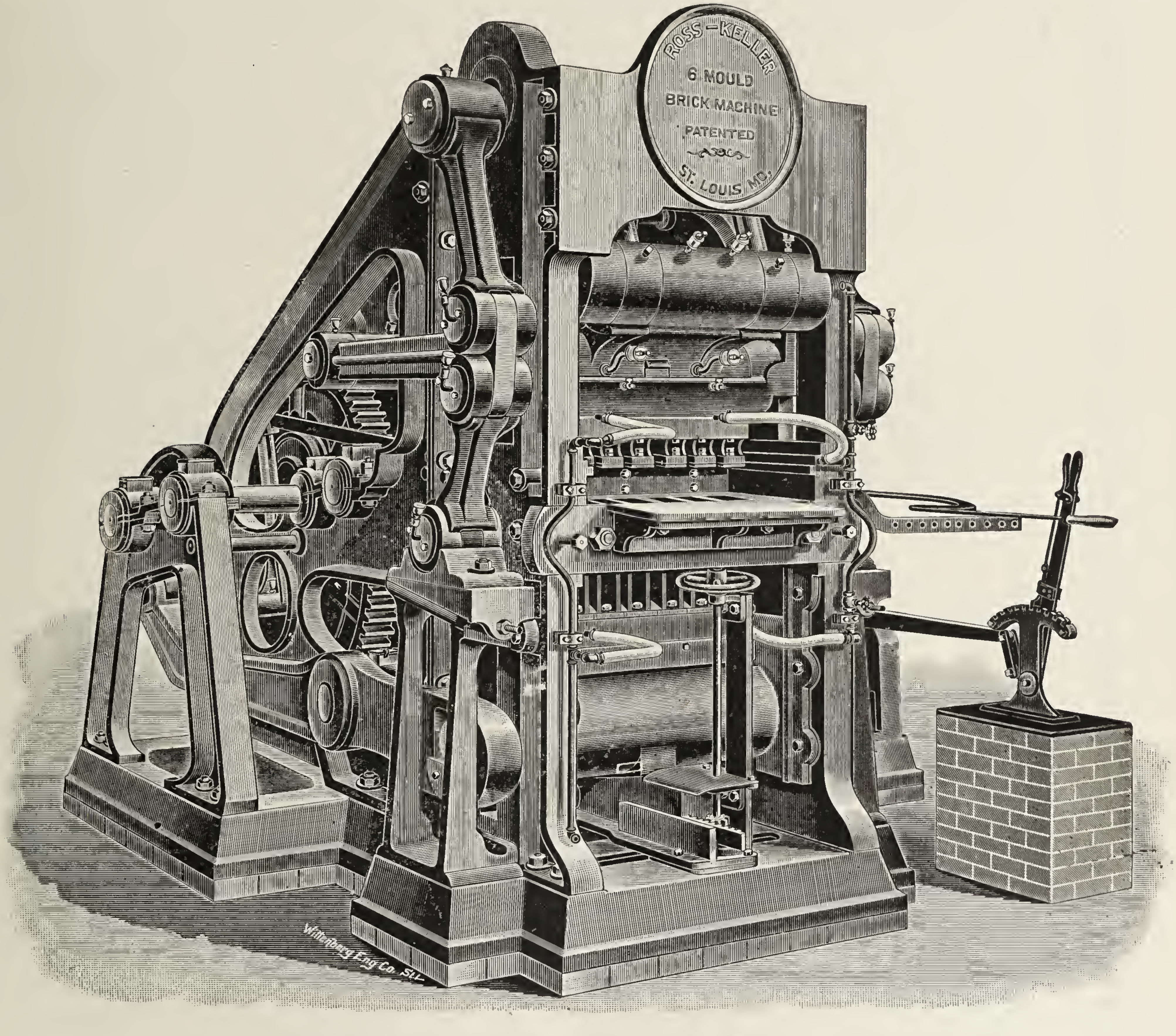
CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The Latest Improved

Ross-Keller TRIPLE·· PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

BRICK SET IN KILN DIRECT FROM MACHINE.



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has **twice** the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made. Press is guaranteed for two years against breakage.

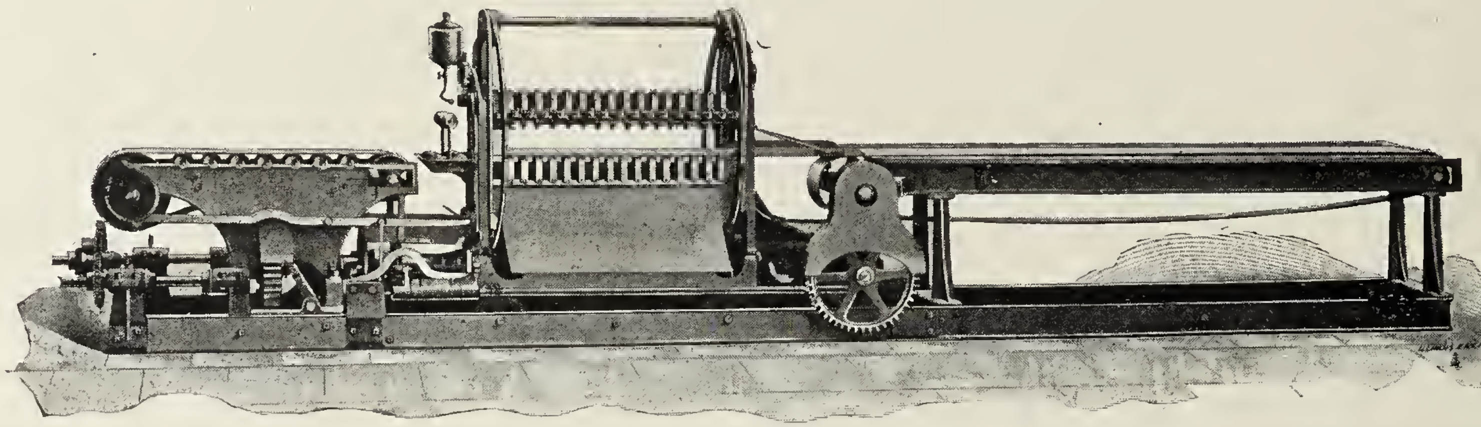
If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

915 Holland Building, ST. LOUIS, MO., U. S. A.

The Wonder Clay-

IS UNEXCELLED for the manufacture of **BUILDING BRICK, PAVING BRICK,**
Wonder Machines are made on original and correct mechanical lines. Second, they
known to expert mechanics. Hence their superior wearing qualities and large
Wonder Machines offer several distinct advantages: Owing to their peculiar
importance to paving brick manufacturers as it insures a product, whether repressed or
much better than laminated brick. The remarkable success of **Wonder Machines** is
ing, we will be pleased to give those who are interested, the address of manufacturers
for themselves. For capacity, quality of product and wearing qualities they are not
In addition to the machines shown on these pages, we also make a full line of **Clay Supplies,** and will cheerfully quote prices.

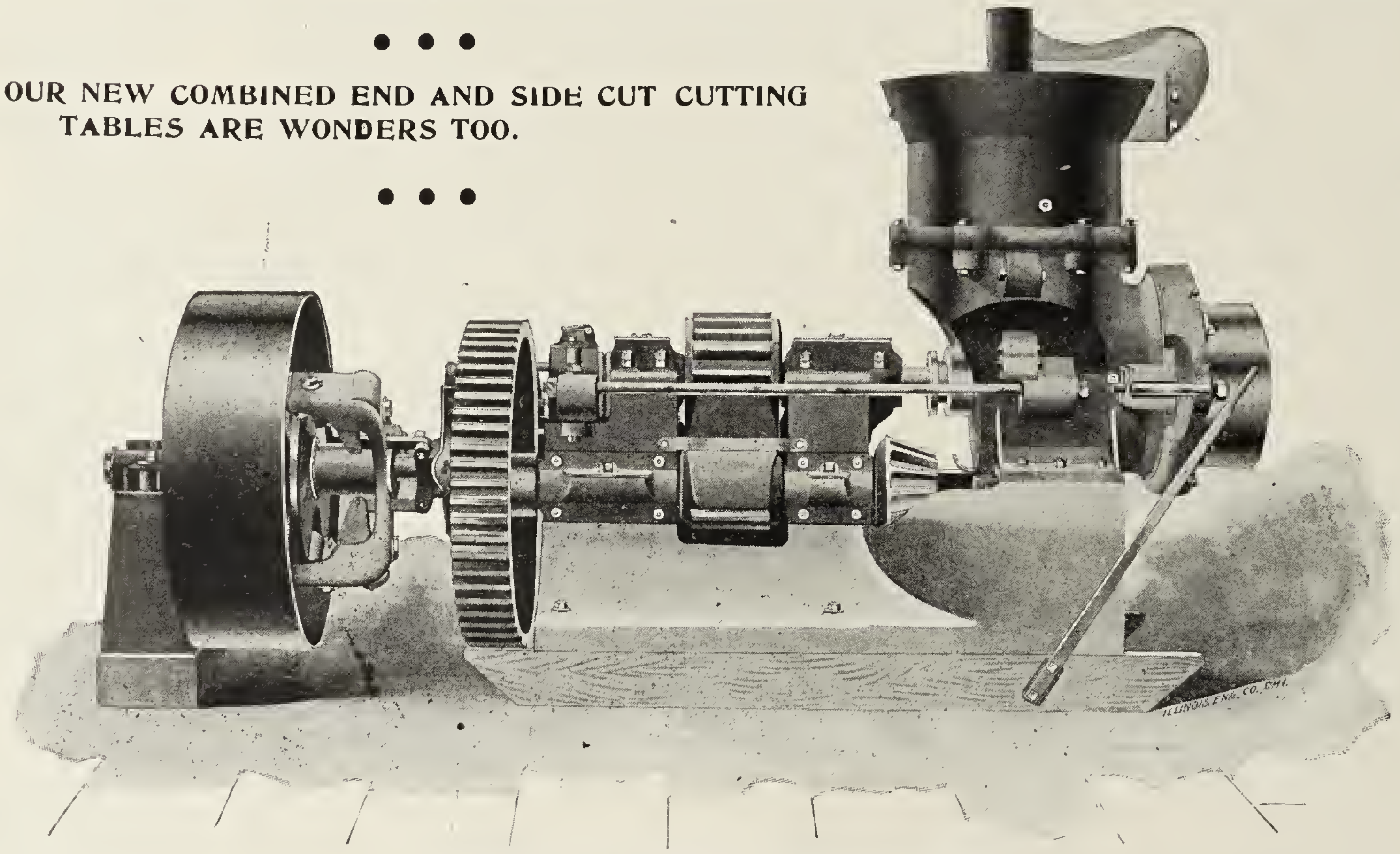


Cunningham's Improved Combination End and Side Cut Automatic Brick Cutter.

• • •

OUR NEW COMBINED END AND SIDE CUT CUTTING TABLES ARE WONDERS TOO.

• • •



The Wonder Tile Machines, made in two sizes.

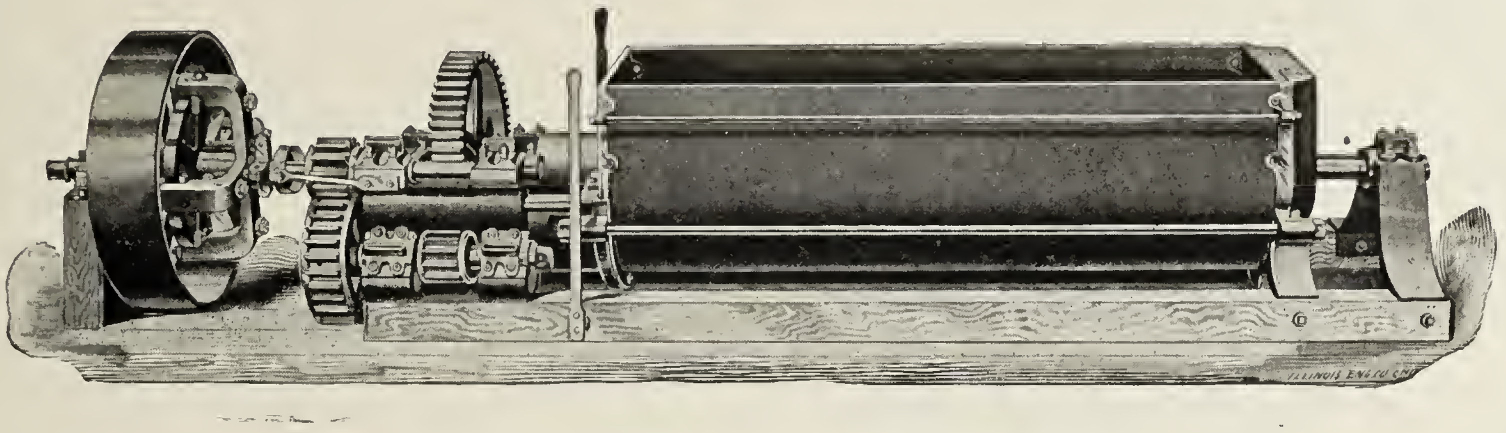
Have You Seen Our New Catalogue ?

CHICAGO AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

THE WALLACE

Working Machinery

HOLLOW BRICK and DRAIN TILE. This is due to several very good reasons. First,
are made of the very best material; and Third, in the best and most substantial manner
capacity.
construction, their products are remarkably free from lamination. This is of much
unrepressed, that will withstand the severe tests to which paving brick are subjected,
fully attested by all who have used them during the past ten years. As seeing is believ-
in their respective localities, who are using our machinery, for **Wonder Machines** speak
excelled by any.
Crushers, Pug Mills, Clay Elevators, Screens, Barrows and all Brick and Tile Yard



Open Top Pug Mills of any size and capacity desired.

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WONDER BRICK AND TILE MACHINES WILL WORK ANY CLAY THAT IS ADAPTED TO THE STIFF CLAY PROCESS.

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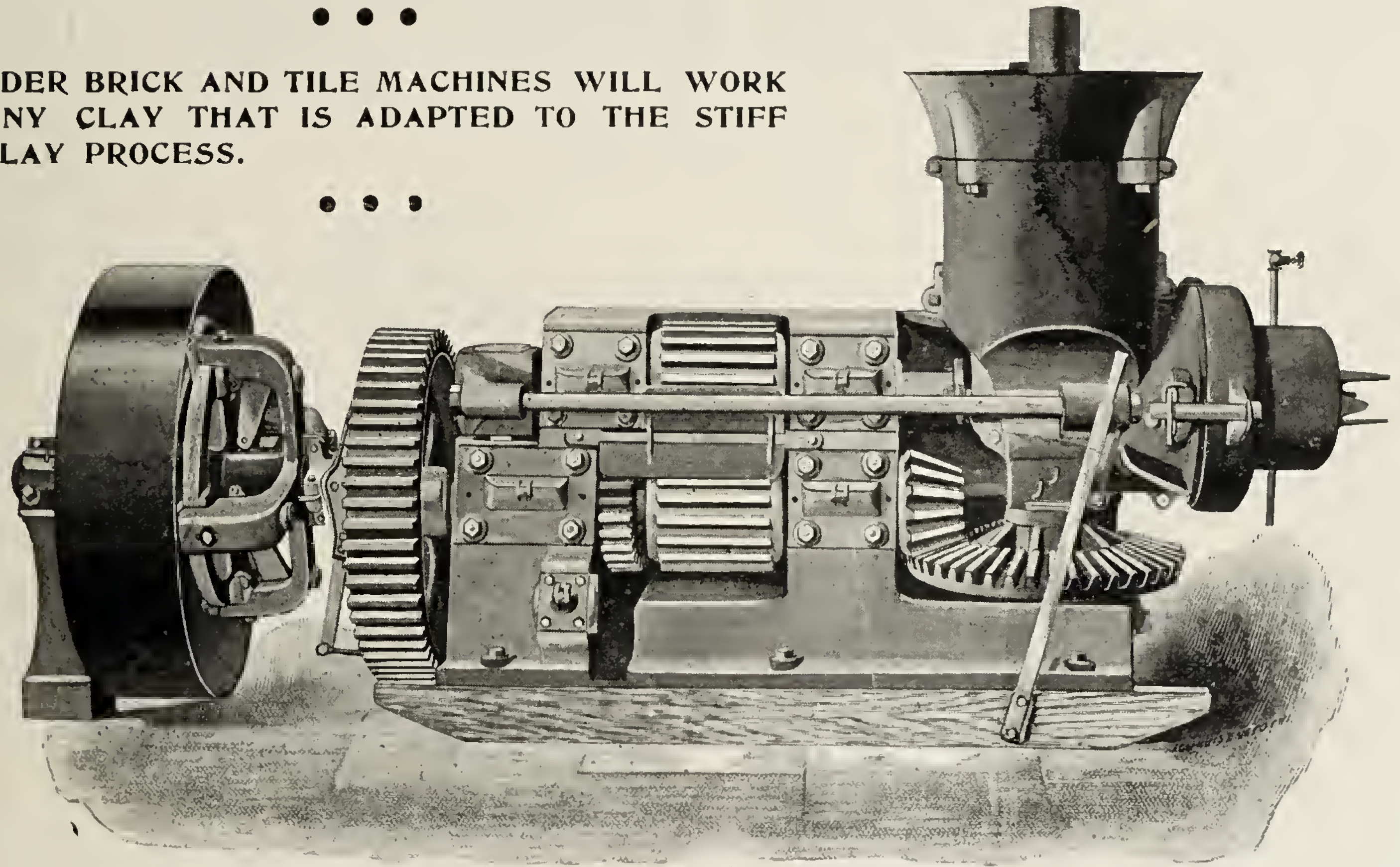


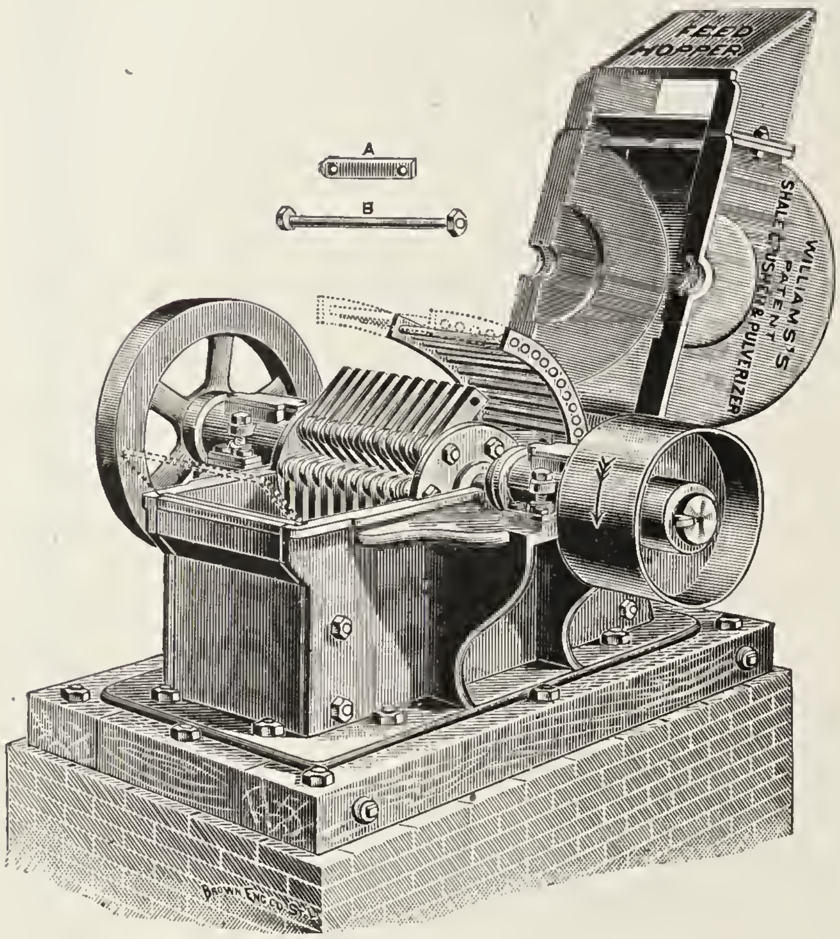
If you
Want
the
Best
Brick
and
Tile
Machinery,
Don't
Fail
to get
Our
Prices.

Wonder Brick Machines, made in four sizes, with capacity ranging from 20,000 to 100,000 brick per day.

MANUFACTURING CO.,
Frankfort, Indiana.

The Williams Patent Crusher & Pulverizer Co.,

of St. Louis, Mo., U. S. A.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

By THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

FOR FURTHER INFORMATION WRITE TO

The Williams Patent Crusher and Pulverizer Company,
2701, 2703, 2705 and 2707 North Broadway,
ST. LOUIS, MO., U. S. A.

Branch Offices:
NEW YORK OFFICE: Washington Life Bldg.
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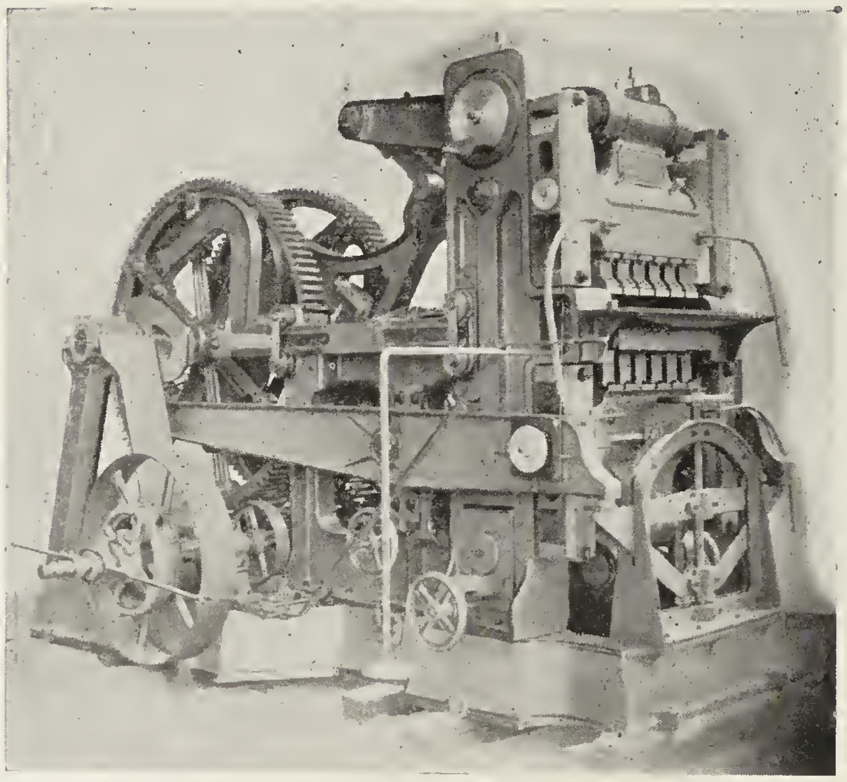
The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, DURABILITY and SIMPLICITY.

The lightest running Press in the market, requiring only 6 to 7 horse power to operate the largest 6-mold press. All parts subject to strain are made of the best bessemer steel, and can be seen and gotten at easily. The thickness of the brick can be changed and regulated without stopping the press, and every press is fitted with the Fernholtz mold, which is admitted to be the best in use. For fine pressed and ornamental brick, this machine cannot be equalled, the pressure on, and movement of the clay in the mold being such as to prevent granulation, and insures the most perfect product possible. We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer**, and the **Fernholtz Clay Mixer** in our own factory and guarantee them fully.

The opinion of those using our press and full information on application.

The Fernholtz Brick Machinery Co.,

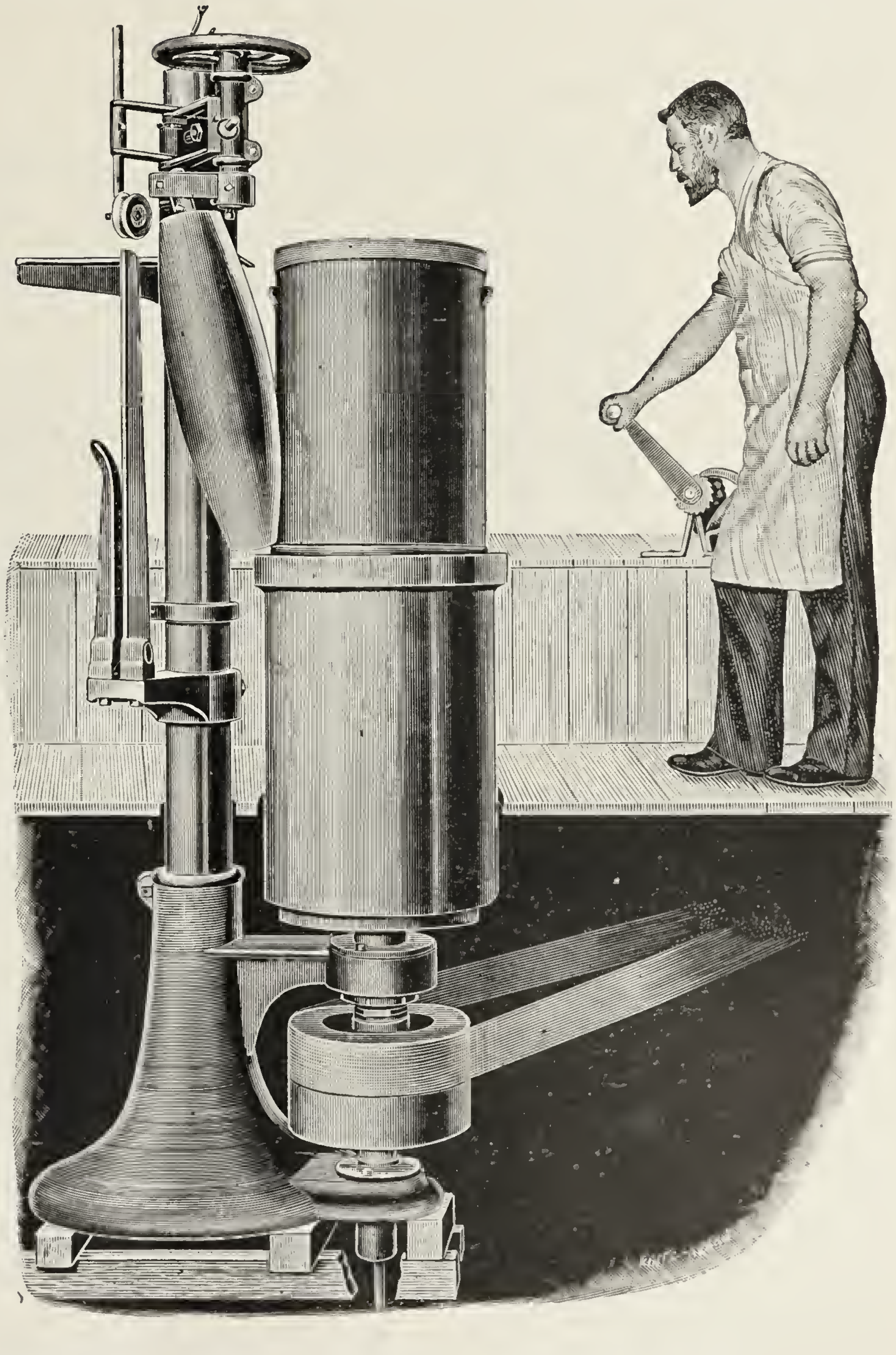
1214 and 1216 Poplar Street, ST. LOUIS, MO.

The BEST

Large Pottery Ware MACHINE ON EARTH.

RANGE 6 TO 60 GALLONS.
80—30 GALLON TUBS MADE IN 10 HOURS.

ALWAYS IN ADVANCE
READY TO MEET YOUR REQUIREMENTS.



Our Reputation for
Superior Machinery
AND
Fair Dealing
IS WELL
Established
....AND....
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POTTERY,
SEWER PIPE AND
DRAIN TILE
MACHINERY.

TAPLIN, RICE & CO., AKRON,
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The Standard Drier

FOR BRICK AND TILE.

We are very much pleased with your Drier—it does even better than you guaranteed.

This is very gratifying to us as our first experience with Driers was very discouraging; in fact, a failure both as to drying and handling our material. The great mistake we made was in considering a proposition from and awarding the contract to a party who made us a lower price than yours, on our first Drier. In buying the second time we did not consider a bid from the first builder at all. Now we see the difference. There is no comparison between the two Driers, neither in equipment, workmanship or system.

Respectfully,
ENSLEY BRICK CO.,
Ensley, Ala. *H. L. Finkler, Sec'y*

EVIDENCE OF SUPERIORITY.

Hundreds of Testimonials. Ask for them.

Ensley Brick Co., Ensley, Ala.

ADDITIONAL PROOF.

What others say is What Counts. Ask for Catalog. It tells all about THE STANDARD DRIER.

Gentlemen:—The Steam Drier you put in our plant has been in use one year, it has been subjected to trying tests. Beginning in the Winter with the clay wet and sloppy, and the shale full of frost, our soft mud brick entered the dry house cold and clammy. Under the scientific yet common sense method of distributing the heat and nature's own way of carrying off the moisture, our brick came from the Drier, sound and thoroughly dried and free from checks or fracture. We dry our soft mud shale brick in 24 hours and our brick made from clay in 48 hours The Drier is easily controlled, in fact it runs itself with no expense so far, for repairs or renewals; all that is required is steam sufficient to keep the temperature at 120 degrees at the receiving end, and about 165 degrees at the discharging end.

The cars we purchased of you are the best and most practical we have seen. In fact the Drier with its outfit is to us an agreeable surprise, in the matter of durability, practical use and expense on account of repairs.

Yours very truly,
THE ADAMS BRICK CO.,
Indianapolis, Ind. *J. C. Adams, Pres't.*

The Standard Dry Kiln Co.,

186 South Meridian Street. ***INDIANAPOLIS, IND.***

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXI. INDIANAPOLIS, IND., JUNE, 1899. No. 6

Written for THE CLAY-WORKER.

A WIZARD'S WORK.

A Story for Little Clayworkers.

THERE IS A LITTLE INDIAN maiden staying at the Smithsonian Institute in Washington for whom they have fixed a fine building. Of course, others use it, too, but she doesn't object to that at all. Indeed, she has had so much company that she doesn't pay any attention to visitors, and might be considered quite rude, but not by one who knows her. She was just the same roly-poly Indian "dolly" that she is now, but that was years ago, and way out West. She frolicked and she played, and she didn't like company—I mean dressed-up white company—a bit. She was for a long time kept in a sort of basket, all tied up and bound about so tight that all she could do was to wink. Of course, she could have yelled, but it wouldn't do any good, and, besides that, little Indian babies are trained not to yell. This basket business did not meet her ideas a bit, but she had confidence in her mother, and knew she would only do what was best and right, so she stayed in the basket. It is just possible also that the fact that she was tied in had just a little to do with it, too, and then her little, wabbly legs wouldn't work if she had gotten out, so—well, anyway, she stayed until it was time for her to walk, and then she just walked, or, rather, she walked when she didn't run, which was what she did most of the time. Well, the little legs got over being wabbly, and were just as hard and strong and chubby as they are to-day. They carried her all about that Indian camp out West, and she knew every rock and bunch of sage bush, as well as some of the cactuses, but not many of those, because a few of them went a long ways. She didn't want many samples of that kind of plants. Every day this little brown Indian "pudge" would get some other little Indian girls and boys together, and they would have the nicest kind of a time. They had rigged up a beautiful little tent, or tepee, as they called it, or, rather, their mothers and brothers had rigged it mostly, and that is the same identical tent that she still keeps with her inside that big building at Washington. She didn't have any French doll with a wax face and eyes that would just stare you out of countenance until you laid her down and then snap shut so quick it would startle you, but she did have a funny little buckskin doll with bead eyes that were always on duty and thoroughly reliable, and this dolly was all the more to be relied on because she was thoroughly domestic in her tastes, having received all her shape and adornment directly from the strong hand and limited work basket of "pudge's" mother. Other playthings they had in plenty, for their demands, which were not of the pampered overindulged kind that pertain to the children of to-day, but were plenty for their needs. But one day there came into the circle of acquaintances of this Indian "pudge" a new sight, a new experience—a man with a white face and hands, and black, shining moccasins, with funny clothes, and generally different from any of her former Indian friends. This white man came, looking and prying around, and caught sight of the little tent and the little pappooses (for that's just all little Indian boys and girls are). He saw the little pappooses playing around this little tent, just as they are still playing about it in the big house at Washington, and just as they played around it all through the great World's Fair. The way this happened is what I want to tell you, for yesterday I seemed to get the confidence of the little Indian girl, and she told me all about it. The white man was a very pleasant, kind-looking man,

BIG CHIEF "BUTTON HOLE."
Executed in Terra Cotta by the American Terra Cotta and Ceramic Co., Chicago.

but he was a magician—a most powerful magician—and he not only stole away the tent, but he stole away all the children, and changed them into wax, and stood them up just as they stood that day, away out on the plains, and he told them that they should not grow old, nor change,

Well, another funny thing is that, after these shrieking pappoose babies had got away from the magician (he keeping tight hold of their shadows), they kept their flesh and blood away from him, and went off and kept on growing, not getting prettier or cuter, but gross and fat, and coarse and rough, and big and burly, and dirty and tough, until they didn't look the least bit like the bright shadows the magician had caught. I am sorry to say, indeed, that the bodies they rescued so hurriedly didn't seem half so nice as the shadows they left behind, and no one would ever recognize them as at all the same. Indeed, they long since got to be great, big, dirty, thieving, whisky-saturated, reservation Indians, I am sorry to say, and settled down to lie and steal, to beg and borrow, to sleep and eat, and not to labor or wash, and their general career became so disreputable that we won't mention it further, but will just follow the shadows, which the magician caught, as being much more pleasant and profitable.

It was only by chance that the magician happened to catch the little maiden when she was looking her cutest, for if she had known any one saw her she would have been scared to death, and so he could not have gotten her shadow, or, if he had, it wouldn't have been a cute one anyway, and all the world would have lost it, for you know this magician didn't catch these shadows just for his own use, but he caught them for all mankind—for men and for women, for the highest and lowest, and for the old and young; yes, for the young especially; for just such old folks as me, and for just such young folks as you.

He has just changed them into wax so the wax would hold them, for a shadow wouldn't do any one only a magician any good; but the magician, after he had tied the shadow up in wax, knew that it was safe for other generations, and that, no matter how coarse the body grew, or how much it reeked with onions and whisky, still the shadow tied up in wax by his magic would always tell of freshness and goodness, and never get bad.

So the shadow of the little Indian maiden has peeped into that little tent, and the eyes have been twinkling with fun and with sparkling inquiry as to what they would find; the lips have been ready to part with a peal of laughter; the feet have been poised ready to make rapid flight, and yet they have stood thus, year after year, just exactly as the magician caught the shadow on the plains. Throngs of people have passed and looked at her—throngs from all classes, from the richest to the poorest, from the most ignorant to the brightest in the land; all have stopped and have gone on brightened and revived by the glimpse of the bright, laughing Indian tot, as if they had a breath of the pure, free air fresh from the plains she came from. But she has always retained her composure, because the magician did his work well.

The only time that his art was tested severely was one day when the fame of the cute little Indian tot had come to the ears of the beautiful lady that lived in the great White House in the same city; and, when this lady took her own little ones to see the little Indian tot, when our little Indian heard their soft little screams of delight, it seemed as though she must break through the magician's charm and ask them right in to play with her, and, when she heard the soft voice of the mother telling her story, she almost cracked the wax, but the charm held.

By the kind art of the magician thousands of people who never get out of the cities have, looking through his eyes, caught an actual glimpse from the plains. They have had a glimpse of childhood free from all restraints. They have had a breath of the plains, and it has been good.

WILLIAM D. GATES.

Written for the CLAY-WORKER.

A TRIP TO BALTIMORE.

The Clay-Worker's Philadelphia Scribe Has a Pleasant Visit with Chas. H. Classen and His Neighbors.

All the Yards Are Busy.

WHEN THE SUN is blazing hot and your clothing sticks closer than a brother, and like the well born Britisher you find yourself grumbling because there is nothing to grumbling at, its a dead sure sign you need a change and lots of it. My condition usually so docile had reached that stage on Decoration day. The only thing to be done was to buy a railroad ticket, a box of matches and some cigars. Then I proceeded to catch the 3 p. m. train from New York to Philadelphia en route to Washington.

Now, I know brickmakers are great travelers, and have straightened their backs against many plush seats and on many lines, but those who have tried it will agree with me that for comfort, speed and civility the "Royal Blue" B. & O. train gracefully takes the palm. Right on time she rolled into Twenty-fourth and Chestnut streets, and so did I, and one minute later we were both skirting the banks of the sluggish Schuylkill. Train No. 533, drawn by engine No. 1321, two day coaches and the parlor car "Rathleen," and a mighty civil conductor, proved sufficiently large enough for my notebook camera and myself. That glass eye of mind was busy all along the route; the good eye, the right, I gave up absolutely to business, and the glass one only takes in the picturesque and the beautiful; and as we came up out of Delaware, coursing along to the tune of "I've got your trunk, I've got your trunk," the flories of the Susquehanna and the Maryland's rolling grounds bethought me of Tennyson's lines:

CHAS. H. CLASSEN'S TROTTER—Mr. Classen in the Back ground.

"By thirty hills I hurry down,
Or slip between the ridges;
By twenty thorps, a little town,
And half a hundred bridges."

Running over a smooth track at forty-eight and fifty miles an hour in solid comfort, sound and free, I watched the whole darn country. Indeed so easily did we glide with the increasing momentum of the train that I almost wished for a sudden pull up, in order that I might be thrown out of the mental desuetude into which I was gradually sinking. Nothing occurred to disturb the peaceful enjoyment, and at 5:06 p. m. we rolled into the Mount Royal Station, Baltimore, refreshed and ready for work. Try it, boys, when you're coming to visit the Master Builders' Exchange, and you will have no cause for kicks of any kind.

—At the Master Builders' Exchange.—

Early the next morning I had that princely good fellow at the end of the 'phone, Charles H. Classen, who insisted on waiting at his office, 207 Bowley's wharf, until my arrival. After a cordial greeting, earnest inquiry as to the brothers along the line and the Secretary of the N. B. M. A., under the wing of Brother Classen, I was escorted to the floor of the Baltimore Master Builders' Exchange, where in turn I made the acquaintance of the president, P. M. Womble; E. D. Miller, secretary, and E. M. Noel, one of the directors, and a well-known contractor. Considering my environment, it was no small wonder that the famous silver loving cup presented to them by the members of the Philadelphia excange in October, 1895, should be brought out for my inspection. The only regret I had in this connection was that the beautiful thing was empty, but as one wag facetiously put it, that was more than could be said of the men or committee who presented it. Friendly converse usually provokes an appetite. Now I had but one appetite, and three luncheons were offered me. Oh, you can bet on the hospitality of the Baltimore boys, and no reflection on any other, but its a way they have. They first build a large restaurant or hotel for a man, then they stock it with customers to help the host along. At least that's the way it looked to me. Over our cigars and coffee Brother Classen made me feel comfortable by offering to drive me over to the plant of the Baltimore High Grade Brick Co. and his own. With the thermometer standing at 94 degrees in the shade, this did not permit of any declination on my part. He did the driving and I did the smoking, and enjoyed it immensely.

Brick Works of H. W. Classen & Co., Baltimore.

Round past the docks and up on to Federal Hill Park overlooking the city and the famous Carroll hills. As we swung along toward the Patapsco river I questioned Brother Classen as to the future possibility of getting Baltimore's streets straightened out and repaved with vitrified brick. And this is what he told me: "Well, out of deference to the Clay-Worker we have started to pave Randall street as a beginning," and pulling up I alighted to find this was the gospel truth. Right before me was Randall street, 180 feet long and 30 feet wide, already bedded with four inches of gravel and three inches of sand, ready to receive the vitrified brick supplied by Welch, Gloninger & Maxwell, of Pittsburg.

—Classen's Brick Plant.—

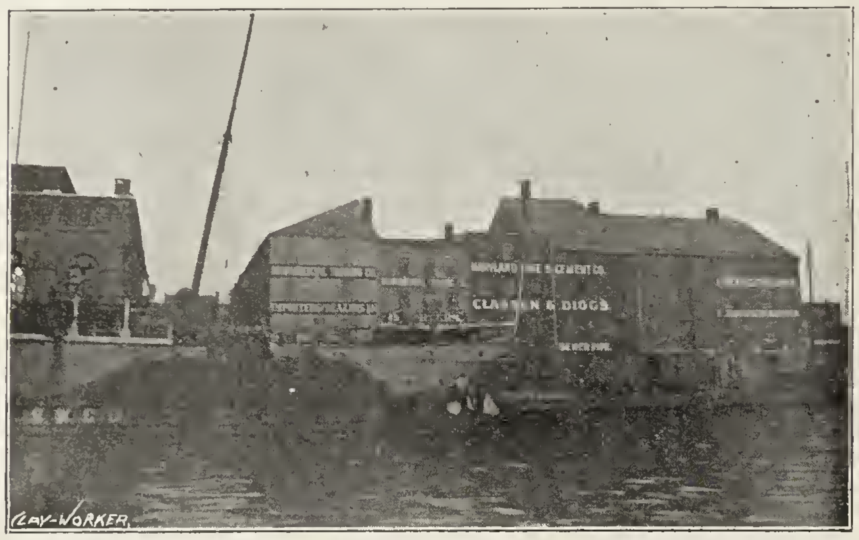
I found pleasantly located on the main branch of the Patapsco river, within pistol shot distance of Fort Carroll and old Fort McHenry, made dear to our patriotic Americans by the pathos of Francis Scott Key. The works cover thirteen or fourteen acres, bounded on the front by the huge coal tipples of the Baltimore & Ohio Railroad, making a fine source of fuel supply and a track direct to the yard. The clay bank, right down to the bottom of its twenty-four foot depth, shows up well with a tough blue red tenacious body of clay, and in such quantities as to give little or no anxiety to the burner as to the possibility of its giving out. Here the clays are dumped right on to the belt and into the disintegrator, thus feeding the Martin machine, which turns out daily 31,000 to 32,000. A Chambers granulator and a Parry screen makes the total of the machine assistance. One large tempering pit provides for the six or eight hand gangs, and all told Brother Classen turns out every year close upon six million hard stretchers and repress in a season lasting from April to November. Four ten arch up-draft Dutch kilns stand adjacent to the drying racks, and this is all controlled by the watchful eye and vigilance of Charles H. Classen, whose only fault is that his heart is larger than his mouth. By this I mean he won't talk about himself. His partner, Diggs, associated with him for the past five years in the lime and cement business, swears by Charley Classen, and is ready by affidavit to prove that during that period he has never heard him use a "great big D."

The limestone quarry is situated at Texas, some fourteen miles north of Baltimore. Here, at 75 feet below the surface, they have a big source of revenue, turning into Baltimore some 16,000 to 20,000 bushels of crushed stone monthly, and while Classen leaves this entirely to the supervision of his jolly partner, there is no green grass allowed to grow under his feet.

One thing Classen does declare, and that is that he is short of brick, and that Baltimore men have awakened to the necessity of cutting down the erection of so many dwelling houses (from 3,000 to 2,000 each year) in order to decrease the surplus stock. As I find it, I am glad to see a marked change of improvement. Money is easy, and orders are being very generously given out. On our road back we passed the old stamping ground of the Baltimorean brickmakers, Columbia avenue, and the direct road to Washington if not to the presidential chair. Well, here I must leave my thoughtful host, whose mental and physical make-up is like unto his sand faced or stretcher brick, composed of good clay, with lots of grit in it, even in surface and everlasting in uniformity of color or disposition, and having the same honest ring in the voice that you get from his brick.

—The Baltimore High Grade Brick Co.—

Under the genial care of Superintendent Harry W. Wanamaker I found myself within the two-acre inclosure which comprises the plant at Columbia avenue and the Baltimore & Ohio Railroad. In this the well-known white, buff, gray and iron spots or Pompeiian brick are made. I found the layout consisting of four Flood down-draft kilns, two large muffle kilns, one medium and one small, and the usual machine equipment in excellent condition. The entire plant was built by Chisholm, Boyd & White (known, I'll wager a new straw hat, to every reader of the Clay-Worker) along in 1896, and under the direct supervision of Mr. Boyd. It was, I believe, the last work he did, but, like Michael Angelo, he declared the last to be his best, semi-dry process. Quietly and unostentatiously Harry Wanamaker guided me around to the clay shed, where the white malleable material lay mellowing before running it into the screens. Fine and silklike in texture, it gave signal evidence that the high grade people have the best material, and are sparing no pains to produce the finest ware possible. Harry Wanamaker could write volumes on what I don't know of the chemistry of clays, the building of a kiln and the burning. Therefore I held back awful discreet. He described the modus operandi tersely and thusly:



Classen & Digg's Office on Bowley's Wharf.

"You see, we allow the clay to lie here and mellow, then we run it through the screens and into the dry presses, setting it right into the kiln from the press, and burn for ten days. We use the best coal and plenty of it, for it is false economy to be sparing of fuel." Around on the other side of the yard was an illustration of the results. Here in the stacks or piles we handled the white, buff and the famous gray, dappled with its assimilation of manganese and the white clay spoken of. Clean cut, fine in texture and unvarying in form or shade, this holds the market in New York, Baltimore and the South today. It cannot be duplicated. Its effect singly or in the mass is soft, pleasing and dignified, and seen in the building of the Atlantic Trust Company, designed by Winslow & Wetherall, architects, of Boston, a twelve-story structure, measuring 60 feet by 90, recently completed. The entire upper ten stories finished in the gray, presents a fine blending of the light and shade values unequaled by any stone quarried. Architect Hardenburgh, of New York, was so attracted by it that he decided in its favor, and has used it in the facades of the Hotel Raleigh, in Washington, D. C.

Madame Jennesse Miller chose it for her residence in Washington, thus giving it the sign royal of her advanced approval as a medium of strength, tone and pure aestheticism.

Atlanta, Ga., through Architect Grant Wilkins, contains a monumental illustration in the Prudential Life Insurance building, and South Carolina chose it for the Y. M. C. A. building, and the Montgomery terminal of the Western Alabama Railway presents the cleanest faced building in that part of the country owing to the use of the gray brick.

Here at this identical yard some four and five million high grade brick are turned out annually. During the past year, however, the demand has found them frequently short, and to obviate this in the future they will start the erection of two more Flood kilns. Or rather I should say from plans drawn by Harry Wanamaker, who proposes to erect a continuous muffle kiln, having for its object a continuation of the radiation by subjoining one muffle kiln to another.

A short distance above on the same line may be seen the plant No. 2 of the High Grade Brick Co., and here some two million common brick are turned out annually, while adjacent to this may be seen plant No. 3, where common and hard are turned out to the tune of 12,000,000 every year, thus giving them an annual output of nearly twenty million.

J. R. Wilson, vice president and general manager, is one and the best one of three generations of brickmakers, and almost as fine a judge of cigars as clays, i. e., my experience. Well, he fills the chair at the main office on the second floor of the Master Builders' Exchange, and fills it well and comfortably.

The sun was beginning to drop a bit, and as Brother Classen was still waiting patiently to carry me back I reluctantly deferred for another day an intended visit to the other yards which we passed on our way back. Reaching Calvert street we gave the horse a mint julep, and Mr. Classen and I contented ourselves with a bucket of water and a sweet good night.

W. P. LOCKINGTON.

Baltimore, June 2, 1899.

Written for THE CLAY-WORKER.

A BRICK FACTORY IN A WOODEN TOWN. No. 13.

L. C. M.

TWO YEARS AGO we exhausted the clay from the bank we were then using, and were forced to go to another bank about 300 yards from the first. The clay from our old bank had given us some trouble at first in drying, but we soon learned to manage that all right. It possessed a quality in burning that was very admirable for our system of handling clay. While it required great care in drying, if it was once well dried it seemed almost indestructible. This careful drying had to extend throughout the entire drying period until thoroughly watersmoked. Then we could raise heat as rapidly as we pleased, finish off the burn in a short time, cool the kiln rapidly, and all this haste seemed to have very little, if any, bad effect on the burned ware. To be sure, there was one point that required considerable care and skill. If we raised the temperature at any place in the kiln above the fusing point, we would have a lot of melted and twisted bricks. There was hardly an appreciable amount of shrinkage in burning, so that we could not judge by the settle whether our burn was sufficient, but had to judge by the color of the heat when it had reached the desired temperature. We never used a pyrometer of any kind. In making the change to the new clay bank, we knew there would probably have to be some change in our methods of

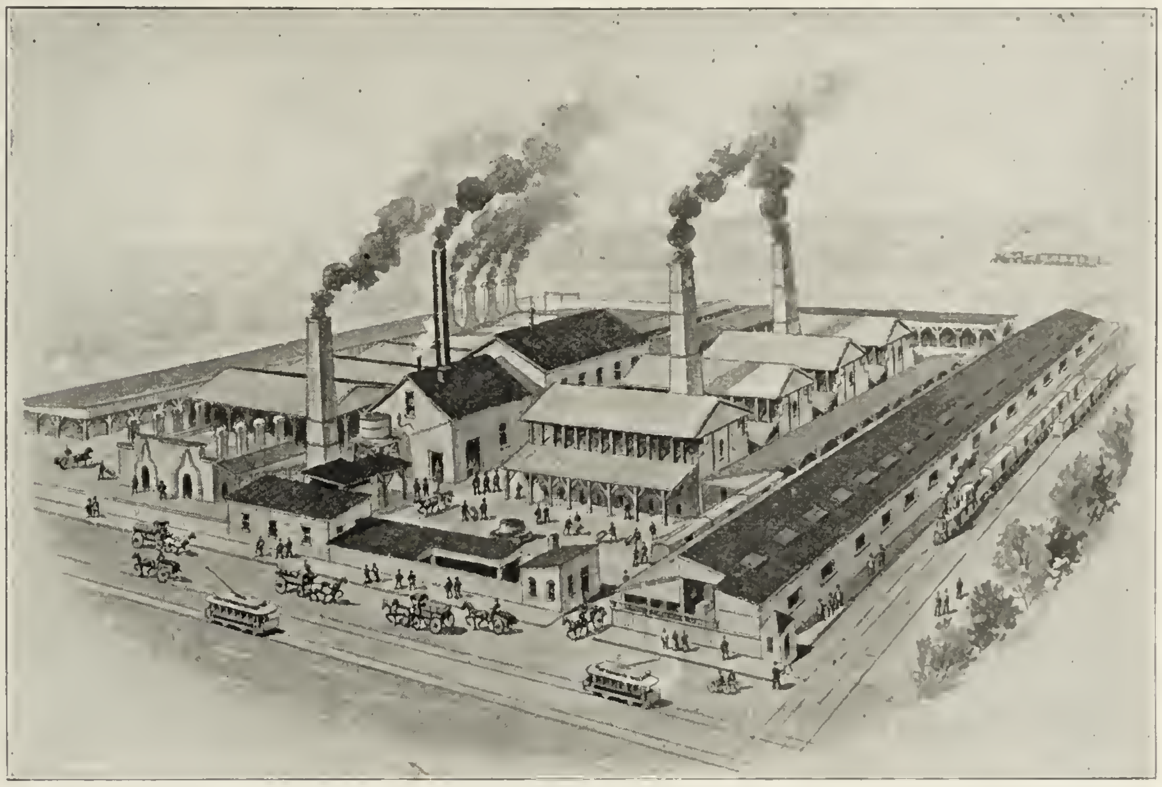
Mr. Diggs and his Pet Hound.

handling. But just what that would be we could only tell by experiment. We knew nothing of making scientific tests of our clay, and, like the average run of brickmakers, decided to risk our own efforts and skill, rather than spend a few dollars for the assistance of an expert. Our change was made at the beginning of the season, and, of course, we filled our large dry sheds with bricks, and watched with considerable interest the first critical test, viz., drying. We were highly pleased with their behavior in the dry sheds. For they showed less inclination to check than our former material. We placed them in the kiln, and followed our usual methods of watersmoking and burning until we reached the desired degree of heat. Then, as a matter of precaution, we cooled this kiln very slowly, giving it about three days longer than was our usual custom. When we began to remove the bricks we found them not quite up to our standard of quality, even in the best parts of the kiln, and, when we came to the arches, a sorry sight greeted us. There was scarcely a good arch brick in the kiln. All were shelled and broken by some agency that had never before given us trouble. While we were slightly disappointed in the best part of the kiln, still we could have passed them off at our regular prices, and only the best judges of bricks would have noticed the change. But those arch bricks were a little too much for a brickmaker who had boasted that his entire loss in a kiln would not exceed 2 per cent. Here was a clear loss of 15 per cent. of material. to say nothing of the loss in reputation one incurs in trying to dispose of such materials. We cut the price on this grade of brick, and tried to induce some of our bargain-hunting granger customers to use them in wells, cisterns, cellars, etc., but, though they never before found anything cheap enough for them, here was something a little too cheap. We tried to work them in some contract work we had for foundations, and to fill in some other work, but our customers objected, and again we were forced to look elsewhere for a market. Our street commissioner offered to use them for filling some of the mudholes of our dirt-paved streets. but we refused his offer.

As stated before in some earlier number of these papers, we had had great difficulty at the beginning of our brickmaking career in making and marketing our product. But that difficulty dated so far back that we had almost forgotten it; and we had had such smooth sailing for about three years that it was quite a shock to our nerves, and caused a decided fall in our high feathers, to be told by our customers that our bricks were not good, for one's entire product is judged by the poorest material that he tries to put upon the market. We scratched our heads in an effort to find out what had hoodooed us, for surely the witches had a hand in our undoing. For had we not proceeded in the most orthodox method in burning that kiln? How could such results follow unless some supernatural influence had worked against us? And had not Irish Joe heard strange sounds about the sheds that dark night he stayed alone while watersmoking that same kiln? Did not old Baldy, the pet of the yard, come up from the pasture the next morning with his caudal appendage so abbreviated that he looked very much like Tam O'Shanter's Meg after that noted interview with the witches? To be sure, Irish was rather imaginative, especially on a dark night, when left to his solitary reflections; and old Baldy's running mate, or, rather, pulling mate, old Pete, the big, one-eyed mule, was in the habit of chewing most anything he could get between his teeth. Still there was no doubt in the mind of old Pompey, the best authority in our town on witchery and kindred subjects of demonology, that the witches had caused the disaster. He met us around the corner of the mill shed, pulled something from the depths of his pocket, and, in a mysterious whisper, offered us his rabbit's foot. "Dat dar rabbit's foot nebber fail to bring luck," he said, in a hoarse whisper. "I nebber goes out 'dout dat foot, and I nebber fails to fetch in something good to eat."

"Yes, Pomp," we said, "if rabbits and squirrels are scarce in daytime, chickens and ducks are plenty at night." Pompey answered with a broad grin, "All de same, dat foot always brings luck, and is a sure fender against witches." We thanked him for his generous interest in our welfare, but we thought it would not be safe for a Missouri nigger to be without his talisman, and so declined Pompey's offer.

But this loss must be stopped. We filled another kiln, and used every precaution possible in every stage of watersmoking and burning. Again we cooled slowly, but, when we drew our product from the kiln, we found the same disastrous result. The loss was so great that we decided we would have to abandon our clay bank, or, perhaps, use only a certain per cent. of clay from it. This meant quite a loss to us, for it would cost considerably extra per ton to get clay similar to our old bank. But, be the cost what it might, we had to make the change, and used about one-half of each kind of clay. The mixture worked all right, and again our bricks were up to standard. The cost was so great under this arrangement that we determined to make a change in one of our kilns, in hopes that we might succeed in making good bricks from the clay that had given us so much trouble.



Work of the Baltimore High Grade Brick Co.

To be Continued.

CLAY SLIDE AT HAVERSTRAW.

FROM TIME TO TIME I report a slide of clay property, generally in Haverstraw. The last one I reported was on what is called the Erickson property, and removed a large portion of a street. One of the property owners sued the proprietors, and tried to compel them to replace the street, and the court decided in his favor. The one before was a portion of Mr. James W. Gillies's bank, which slid over on the Ericksons, and they would not let him remove it, and in the last conversation I had with Mr. Gillies I learned that they had not settled with him for the clay. A week or more ago another portion of Mr. Gillies's bank went over on the other side, on the Excelsior property. A day or so before the slide the bank cracked and gradually settled till it showed a crack a foot wide. Mr. Gillies then called in the service of a civil engineer to approximate the amount of stuff that would go over on the next property. Once before a small portion went over on the same property, and they gave him permission to take it off, and there is no doubt that they will afford him the same privilege. When one looks at the depth the banks are sunk below the river level and take that as the basis, then at least fifty or sixty feet of clay and sand on top of that, it is wonderful how it stands up, especially as the top, or above the river level, is of quicksand, and the bottom, or below river level, is medium strong clay that can be cut with a spade. It is surprising that it has not slid down in the bottom. With a public street in the rear and other property on each side, it confines operations to a small space.

A. N. OLDTIMER.

Written for The Clay-Worker.

ONTARIO AND HER BRICKMAKERS.

A Busy Season in all Lines of Trade.

By M. Jay.

From time to time your very welcome journal gives us a glimpse of what is going on in other parts of the world than the United States, and many are the sketches you have brought before your readers of the ways and means that are utilized to produce the bricks throughout the world. When one reads of the ways and means, and places are named, one naturally feels like turning up his geography and locating that place properly.

A hundred to one, when Ontario is mentioned, the average brickmaker will locate it by the lake of that name, and naturally say Canada and the cold North ("Our Lady of the Snows"). Ontario is a very substantial part of Canada, but it is not generally thought that we are west of the State of Michigan, and that the State of Maine lies north of Ontario; that some parts of Ontario are as far south as Rome, Italy; that it is the fruit garden of Canada, and that grapes and peaches here equal the world was proven at the Columbian fair at Chicago; that a country that has been thought to be in perpetual frost enjoys its summer balmy breezes, and dries its soft-mud brick where the thermometer registers 110 in the shade. But, as it contains an area of 180,000 square miles, it has not yet fallen to my lot to see all the brickyards and plants it contains.

While the staple outputs of Ontario are put down as lumber and grain, we make more whisky than Kentucky, and have in our brickyards a noticeable wanting in comparison with our American neighbors, for, so far, I have never met their helper, the mule.

We have now all passed by the old hand mold, and the soft-mud is now being chased by the stiff-mud process; the semi-dry has gone through its trials and troubles, and the paving brick plant still wrestles with the problem, are they cheaper to make than import? The manufacturers of paving brick grow desperate at the low tariff imposed on importing street pavers, which is only $1.80 per M. Nature has been generous to our American cousins by depositing a layer of coal with its clay while the Ontario manufacturer has to give $3.50 per ton for his coal. Some are working out by practical experiment whether it is cheaper to bring the shale to the mill or the mill to the shale.

In the meantime there are as many American paving brick in the streets of our cities as there are of home manufacture. But, to introduce this half of the output, I feel our American cousin has walked off with the possible profits of the paving brick plants for the next five years, by his expert manipulation and endeavors to make his shale develop a brick paver able to stand the desired test or rattler. We feel that we are on the turn for good times, and what produces this desirable result is accounted for by the government, "so says the Liberal politician." The farmer of Ontario is now giving his attention to fruit, mixed crops and the dairy. Butter and cheese is becoming the product of Ontario, and the grain-producing country is now the northwest. The influx of gold from Klondike and British Columbia filters through those channels of commerce to become locked and waterlogged in the cities, whose banks only pay 2½ to 3 per cent for money, drives the money into brick and mortar, and we have just commenced to congratulate ourselves on the output of brick when the bricklayers and labor unions strike for shorter hours and more money, and back crawls the ever scary capitalist, leaving us in doubt and fear if he will invest himself for the good of the country, the brickmaker and mankind in general.

Though the season has been later than usual, every old machine has been brushed up, old racks straightened and a big push made for who will have the first kiln out, and the general hustle is in full blast on every old brickyard in Ontario. But in the unusual activity this year it is noticeable that the semi-dry press brick business, which was overdone in the boom days of the eighties, are having the rust rubbed off their presses and are again contributing their quantities afresh. They went up years ago along the shale deposits within thirty to forty miles of Toronto like mushrooms; were opposed by others closer to the city who were satisfied to mine their shale from deep deposits, and expend in blasting what others did in freight. When one thinks of the vast amount that has been expended in this process, and which was built up by rival companies far past the possible demands of the best times, but having produced an excellent quality of semi-dry bricks in all colors, shades and shapes, to find now that their output is not just what the artistic architect is wanting, especially for a residence in which he is seeking the effects that are only to be produced from the old soft-mud process, that texture that the sanded mold leaves of a velvet finish and texture, and gives a result that repress and semi-dry press have not yet achieved. This is not the opinion of any one crank or individual architect, but a united effort on the part of the best for the most artistic brick, and is now in demand, and, from present indications, will continue, and is worthy the deepest consideration of every brickmaker, who, having long fought with the varied tastes and demands, and the soft-mud yard has found it impossible to cater to the market with shapes, sizes, colors and mottles, can now find it quite possible to supply a demand by a judicious care for his soft-mud brick by using that part of his kiln where best results have been obtained, and, by lowering his quantity and raising his quality, will find it remunerative for a certain percentage of his output by a more thorough seasoning and reducing of his clay, keeping molds clean and true, by carefully selecting molding sand, care in dumping, backing, loading, all the way through. Laying down a true, good, perfect brick, of a color and texture to be had by no other process, will find sufficient market and a price equal to the best pressed can be obtained, while just that amount of rush to produce quantity has left the best colors and textured brick only fit for backing.

This demand is here for the best of residences, and I am not by any means advocating a general return to old soft-mud brick process entirely. The well-made, well-burned semi-dry press brick will continue a matter of commerce, and are certainly here to stay, but there is an opening for the soft-mud brick as a face brick, and occurs in its proper place, and should receive the attention of the soft-mud yard owner who is ever found regretting the price per M.

Throughout Ontario all the known kilns are to be found. The bold hand of brother Eudaly is seen here and there. We have all the continuous, clamps, and lots of the undiscovered whose virtues are yet to be found, while Brother Carson's peerless system is winning him golden opinions.

Ontario sampled architectural terra cotta some twenty years ago, and used it as something that was sure to melt in the first shower or go to pieces after the first Ontario winter, but it remains, to the astonishment of some and the disgust of the stone cutter and quarry man. Its being talked against, kicked at, belittled and ignored has proven like the Irish peddler's tin—"the more you rub it and scour it the thicker it grows." Time removes prejudice, but time uses up life, too, and the pioneer grows old before the harvest comes, and the crop of terra cotta to be manufactured this year will strain the capacities of the small works catering to the demands. The examples held out by the English and American works have made a demand that nothing short in quality and color will satisfy, while the modeling demanded is equal to the best New York artist's ability.

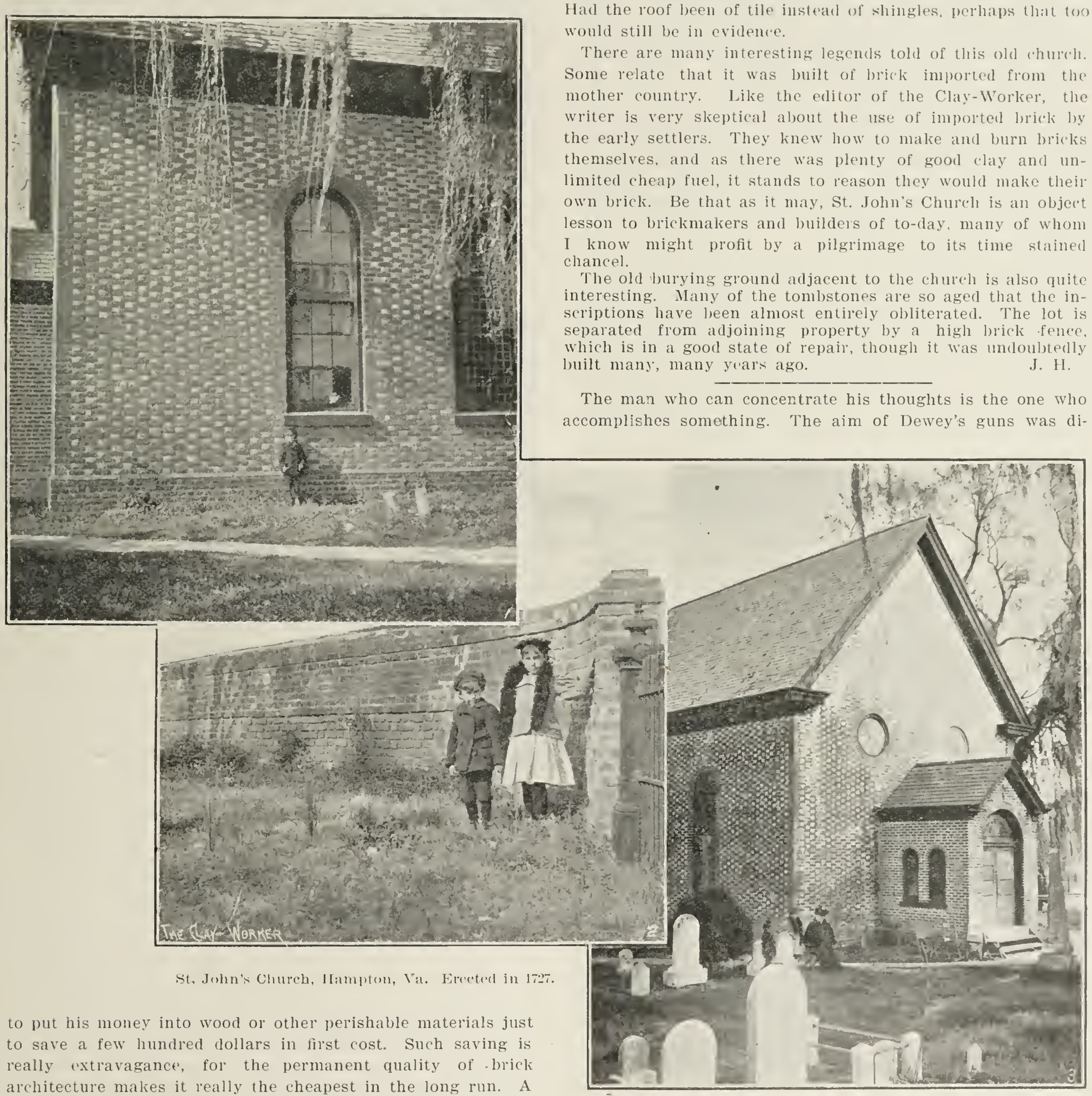
To Be Continued.

Written for the CLAY-WORKER.

OLD BRICK ARCHITECTURE.

THE INTERESTING ARTICLES which have appeared in recent issues of the Clay-Worker, telling of old brick structures both in this country and abroad, are very good reading, for they tell the value of good brick construction in a way that ought to impress favorably all who build homes or other permanent buildings.

If the prospective builder will but consider the lasting quality of good brickwork, he will be less inclined to put his money into wood or other perishable materials just to save a few hundred dollars in first cost. Such saving is really extravagance, for the permanent quality of brick architecture makes it really the cheapest in the long run. A good substantial brick house will stand for generations, with little or no cost for repairs. If it is covered with a good tile roof it will defy the ravages of the elements almost to the end of time.



St. John's Church, Hampton, Va. Erected in 1727.

We have here in Hampton, Va., a very old brick church, now known as St. John's Church, the walls of which stand stanch and firm after exposure to the storms of two centuries. It is a monument to the skill and integrity of the early builders of this country. They not only made good brick and burned them well, but they laid them in good mortar, as durable almost as the brick. I say the walls have stood intact for nearly two hundred years, and the records bear me out, but the structure has been dismantled two or three times during that period ,the roof having been set on fire by missiles from warring factions in the war of 1812. At that time Hampton was sacked and plundered, after which the church was used as a barracks. In 1824 it was repaired, and again used as a place of worship till the war of the rebellion, when it was once more unroofed and occupied by the soldiers. The walls were never seriously damaged, and when peace was declared it was again repaired, and stands to-day about as originally built. Had the roof been of tile instead of shingles, perhaps that too would still be in evidence.

There are many interesting legends told of this old church. Some relate that it was built of brick imported from the mother country. Like the editor of the Clay-Worker, the writer is very skeptical about the use of imported brick by the early settlers. They knew how to make and burn bricks themselves, and as there was plenty of good clay and unlimited cheap fuel, it stands to reason they would make their own brick. Be that as it may, St. John's Church is an object lesson to brickmakers and builders of to-day, many of whom I know might profit by a pilgrimage to its time stained chancel.

The old burying ground adjacent to the church is also quite interesting. Many of the tombstones are so aged that the inscriptions have been almost entirely obliterated. The lot is separated from adjoining property by a high brick fence, which is in a good state of repair, though it was undoubtedly built many, many years ago.

J. H.

The man who can concentrate his thoughts is the one who accomplishes something. The aim of Dewey's guns was directed toward one common enemy. He bore down upon Montejo's ships and finished the job before he attacked anything else. He didn't scatter his ammunition. Neither should you. Concentrate your efforts and storm one point at a time. If your advertising money is limited, select the one paper that, in your opinion, reaches the class of people you cater to, and stay in it forever, adding another as you can.—Ad. Book.

Written for the **CLAY-WORKER.**

CHICAGO PAVEMENTS—PAST, PRESENT AND FUTURE

Second Paper.

SINCE WRITING my first paper under the above caption I have been pleased that there has been brought to my notice ample verification of my views and esimates concerning a relaying of the first piece of burned clay paving laid in this city. It may be remembered that I stated that this piece of pavement was laid fourteen years ago, of Ottawa, Ill., paving blocks, 4x5x12, on the natural sand foundation of this section (Lake avenue, Hyde Park). The street, having previously been graveled, was simply graded before the laying, and a sand filler was employed. Where this paving occurs the street is a lively retail section.

I gave it as my opinion that, were the pavement taken up and the street regraded, 90 per cent. of the blocks would be found in good condition for relaying, and, if turned to present a fresh face to the grind of traffic, the pavement so treated would be likely to do even better service for another fourteen years, because of the elimination of the few unburned blocks originally included.

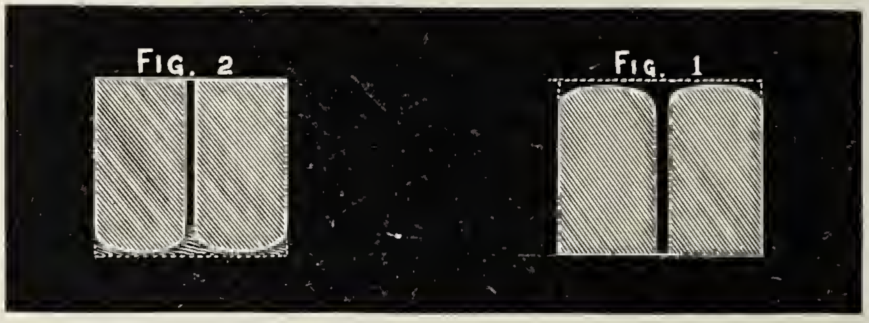
Referring to this matter in a talk had with a gentleman unusually well informed concerning street conditions here, I was advised of the fact that a small section of the paving had been thus relaid, viz., a cross section commencing at the center of the avenue and extending east on Fifty-third street to the subway of the Illinois Central railway, a busy street, leading, as it does, to the railway station and to that section of the city lying east of the track. This information led me to make a careful survey of this relaid section, and in doing so I was able to ascertain the amount of loss from blocks discarded in the relaying, which proved to be about 4¾ per cent.

To us this seems a noteworthy showing. Please remember the state of the art when these blocks were laid (1885). Remember that they have borne the traffic of a second-class business street for fourteen years. Take into view also the character of the foundation, which, from its insufficiency, resulting in unevenness and chuck holes, has resulted in much greater wear to the blocks than had they been laid on firm foundations. We do not remember having our attention called to any presentation of the ultimate value of brick for paving purposes which has anything like the force of this practical demonstration. It would seem proper to infer from this that the life of a good paving brick, under average conditions of city service and laid on a suitable foundation, ought to be nearly equal to the life of a generation. An engraving of this relaid section is presented.

We do not intend to do any pettifogging in behalf of brick pavements. When we commenced these papers we had a distinct understanding with ourselves that, while we were writing in the interest of brick, they would get from us only what of commendation their merits as these appeared to us should warrant. We have presented the facts as a basis for our opinions. Our readers may arrive at their own conclusions from a consideration of the same facts.

One of the early questions we asked ourselves, as we inspected the earliest laid sections of brick pavements in this city, and which has been contsantly recurring to us, is this, "Has the record which has and is being made by these early pavements during what may be termed the experimental period, 'experimental' both as to size, shape, character of clay used, hardness, toughness, degree of vitrifaction,, etc., of the brick, and also as to the proper or best foundations and fillers for best results, been such as to secure the approval of the intelligent taxpayers?" And if "Yes, with limitations, what are these limitations?"

Up to the present date the great mass of the people whose voice is to decide this question in the future have had no pavements to refer to that would more than indicate to them the probable length of life of brick pavements. Their attention has been called to certain facts by the promoters of clay pavers, such as can be verified by them, of the condition of pavements laid at certain dates under certain conditions, etc., as a basis for expectation of life, as the life insurance man would put it. We think evidence of the character we have just adduced (we refer to the relaid pavement) is as near conclusive as anything that can be referred to in the line of facts in the city. We have assumed one thing, viz., that but half the life of nine-tenths or more of the particular paving material referred to has passed. Are we warranted in this? We believe we are fully so. In Figs. 1 and 2 we present sketches that may assist in others in like conclusions. We feel quite safe in assuming that in Fig. 1 the average wear of the block constituting this pavement is adequately and, we think, extravagantly expressed by the dotted lines, indicating a wear of perhaps one-fourth inch at the center of the face, while from examination we believe 50 per cent. of them will not show one-sixteenth of an inch at such point. It was only where foundations had sunken, causing "chuck holes" two, three or four feet in length, that any considerable wear is observable on the whole face of the block, but, as these uneven places did not comprise one-twentieth of the whole surface, and perhaps not half that, and as the loss shown in relaying no doubt largely occurred at such points, we feel warranted in calling the wear indicated by Fig. 1 extravagant. Referring to Fig. 2 we show the blocks as turned to present a fresh face to wear, and, since all the brick used in relaying have had fourteen years' testing and not been found wanting, the 5 per cent. or less of loss having eliminated the soft brick, it will, we think, be conceded that the general character of the blocks have been improved.



Are we "splitting hairs?" We think not. The lesson to be learned is an important one, and one full of encouragement to the manufacturers of brick pavers who have had no object lesson of a similar nature brought to their notice. It may be asked whether as good results may be expected of paving brick as has been realized in the use of these larger blocks. This is a matter of individual opinion, but, since manufacturers generally in Illinois have, after early trial, adopted brick as preferable to blocks, because they give them better average results in quality, we think the quite unanimous verdict will be we would rather take our chances on brick, laid upon a proper foundation, than upon these blocks as laid, and would expect, under similar traffic conditions, even better service.

The reader will no doubt think that our questions as to whether past records made by brick pavements laid in the city are such as to insure future acceptance is answered by the showing we have already made of the large relative advances made as against any and all other materials the present year. This would be but a superficial view of the matter, This late record is gratifying, and shows that there has been a tacit acceptance of brick as worthy of further trial and as promising good results. It also tells the story of energetic and persistent work, coupled with the advantage of a lower cost as against asphalt, its principal competitor. In the long run brick is sure to win, but it must be on its record.

On another section of Lake avenue, about two miles north of the section we have given so much attention to, we find a very pretty stretch of paving done in the use of small, square-cornered common Galesburg brick, called "common" because not repressed, but the product of an auger machine. This is between Thirty-fifth and Thirty-seventh streets, a section given up to good residences. This piece of pavement was laid in 1892, and was also laid upon a sand foundation, two courses of brick having been used, the first laid on the flat, over which was a layer of perhaps an inch of sand, and the upper course laid on edge, with a sand filler. While this pavement has been in use but one-half as long as the block pavement, and has not been subject to as heavy and continuous traffic, it is evident that under similar conditions of service such a pavement will maintain a much more even surface than the single course of large block laid on a similar foundation. The reason for this is evident. Every brick of the upper course is supported by at least 64 inches of surface in the lower course, and as frequently by 96 inches, while 48 inches covers the maximum footing on the sand of the 4x12 blocks. The condition of this pavement is such that, while it is on its seventh year of service, we think one examining it would not be unfavorably impressed, if told it had been in use but half that time. We notice some unevenness, but mainly where the paving has been removed and poorly relaid. There are, however, some depressions to be noticed by one in a critical mood, not found where a foundation is what it may be made in the use of macadam or concrete.

Blocks Relaid on 53rd St. and Lake Ave., Chicago. 11 years in use.

For a purely residence district, and where economics are closely studied, this particular picee of paving may be confidently referred to. We are informed that not a dollar has been spent upon it in repairs since its laying, and a careful examination of the entire section shows no place where repairs are needed. We notice here what we have never seen before, except in connection with wood block pavements, viz., a cement curb and gutter, the latter about eighteen inches in width. To our eye the effect was very pleasing. The cement gutter, however, was in many places beginning to show considerable wear, and the practice of supplying such gutter in the place of brick is shown to be one not to be commended. A view is given of this pavement.

This seems a proper point for discussing one phase of the paving question which we believe to be worthy of the consideration of all who are interested in securing good pavements at a minimum cost. There seems to be an impression abroad that only Portland cement is suited for a concrete foundation. This impression is largely due to two things—first, Portland cements are, as a rule, quicker setting than natural cements, and this is a very desirable feature; second, it has been found that no other cement will make a satisfactory sidewalk; hence, the ready inference that it is equally indispensable in a roadway. As to the first there are good natural cements about as rapid in setting. In this region the Louisville is an example. While as to the second reason it may be said that the conditions are so entirely different when we compare the use in an exposed sidewalk with that attending the use in a covered roadbed that the argument has no force with one who is intelligent in the use of cements.

It is granted that for a surface to be exposed to weather conditions nothing will take the place of a good Portland cement, but, when it comes to foundation work, which is free from such exposure, natural cements, such as the Rosendale and Akron in the East, and the Louisville, Utica and Milwaukee in the West, answer most of the requirements.

The general government is a very large user of cement in its public works. What are the views of government engineers on this point? Let me adduce their practice as an answer. So late as 1895 the government constructed the largest lock in the country at Sault Ste. Marie, at the outlet of Lake Superior. In it were used 71,755 barrels of natural cement and but 7,650 barrels of Portland. Most of the government fortifications and lighthouse foundations have been built in the use of natural cements, to say nothing of a very large majority of public buildings. The difference in cost is large. All the past season natural cements could be delivered in Chicago at about 30 cents per barrel of 280 pounds, while 380 pounds of Portland cement has ruled from $2 to $2.30. The advocate of Portland cement will tell you that it will go much further in making a given bulk of concrete. Admitted. Let us allow two barrels, or 56 pounds, of natural as against 380 pounds of Portland, which is more than liberal, and the cost still is 60 cents for the one against $2 to $2.25 for the other. The writer is not a novice in this matter. For many years he was a large user of both cements in connection with public works, and has found that nine out of perhaps every ten barrels so used brought satisfactory results when natural cements were employed, and the conditions were much more exacting than those pertaining to the laying of a roadbed to be covered with sand and brick. In a case where there is little or no drainage, and the work must be done in the water, there is no question but that a Portland cement is desirable, but, under the conditions that pertain to the laying of brick pavements, we have no hesitation in saying that a good natural cement should answer every purpose and at about the saving indicated in figures given.

We suppose paving brick men are not averse to selling two courses of paving brick for use on a sandy foundation, but we give most of them credit for being long-headed enough to prefer selling brick for one course that will give entire satisfaction, rather than for two courses that, when laid, will fall below the high-water mark. Applying this to the last piece of paving mentioned and we conclude that a cost of 15 to 20 cents more per square yard of pavement would have been sufficient to have covered the difference between two brick courses as

Lake Ave. near 35th, Chicago. Laid in 1892 of Galesburg Common Brick.

laid and a one-course pavement laid on a six-inch bed of concrete made in the use of natural cement.

There is one feature which inheres to the laying of both brick and asphalt pavements in Chicago at the present time which both good business sense and the best interest of the taxpayer demand should be done away with, at any rate so far as brick pavements are concerned. We allude to the requirement of a guarantee to keep such pavements in order for ten years. We are informed that such requirement adds nearly 33 per cent. to the bill to be footed by the taxpayer. Two security bonds running ten years must be filed, one by the brick manufacturer and one by the paving contractor, and this helps make up the cost difference, and it would seem from the facts, as we read them, to be an expensive superfluity. (We have brick only in mind.)

Let us see. The city furnishes inspectors to look after this work. They are supposed to be selected for their competence to properly fill the position. The specifications of the city engineers are to govern. Proper inspection secures proper grading and the use of proper materials in the foundations as specified and in the manner specified, else why should an inspector be employed? The paving brick are to be subjected to stipulated abrasion and absorption tests under the eye of city officials. The laying of the brick and the application of proper filler is under inspection. If meeting all the requirements of the contract are thus secured, why the need of a costly guarantee?

Let us take facts as we find them. We have carefully examined a number of pavements from five to eight years old. Repairs made on any of them are as yet nil. On most of them this promises to be the case to the end of the ten years. We may later refer to one or two exceptions, but, in either of these cases, it would seem safe to assume that five cents per square yard will be likely to more than cover any repair bill, and this is why it seems to us that a ten-year guarantee that adds one-third to the bill to be paid by the taxpayer is a costly superfluity. And, if this be true of pavements laid in the past, it seems likely to prove even more so in the future, in view of better material and better methods employed which experience have led up to. E. G. DURANT.

IOWA'S CLAY RESOURCES

And Her Paving Brick to be Thoroughly Tested From a Scientific Standpoint.

THE GREAT CLAY resources of Iowa are at last to be fully investigated from both the scientific and practical points of view. Full and complete analyses and elaborate tests are to be made and careful notes are to be taken on the methods of manufacture, including the proper temperature and manner of burning. As a first step, all the paving brick plants are to be visited and the brick now made are to be carefully investigated. The general methods of laying, cost and wearing qualities of brick pavements are to be carefully looked into. Iowa already ranks high among the States of the Union in the manufacture of paving brick, and the statistics recently collected by the Geological Survey show that the total value of her clay output is now over $2,000,000. The raw material is, however, abundant, and the variety of clay found here has never been fully appreciated. It is believed that the output of the clay-using plants can be very greatly increased, and it is in order to stimulate the development of these resources that the new tests are to be made.

The Iowa Brick Manufacturers' Association, the Iowa Engineering Society, the State College at Ames, the Geological Survey and the State University are all behind the move. Representatives of these organizations met yesterday at Ames, and, after careful discussion of the present condition of the industry, arranged plans for the work. The brickmakers were represented by Messrs. J. B. McHose, J. Brown and C. B. Platt, of Van Meter. In addition, letters were read indorsing the plan, and regretting their inability to be present, from J. B. McGorrisk, of Des Moines, and others. The engineers were represented by C. R. Allen, of Ottumwa, and C. S. McGowan, of Iowa City, who is also a member of the faculty of the State University. The Geological Survey was represented by H. F. Bain and S. W. Beyer and the State College by Professors A. Marston, J. B. Neams and G. W. Bissell. Mr. C. P. Chase, of Clinton, and E. P. Boynton, of Cedar Rapids, who are also members of the committee appointed by the engineers at their December meeting, and Mr. J. H. Charles, of Sioux City, and O. A. Dennison, of Mason City, members of the brickmakers' committee, were unable to be present.

After a short address of welcome by President Beardshear, the joint commission organized by electing Prof. A. Marston chairman and H. F. Bain secretary. An informal discussion followed, after which the plan was drawn up. It was thought inadvisable to undertake any general work on clays for the present, until proper equipment should be provided by the State for that work. It was proposed to confine the work to a study of paving brick.

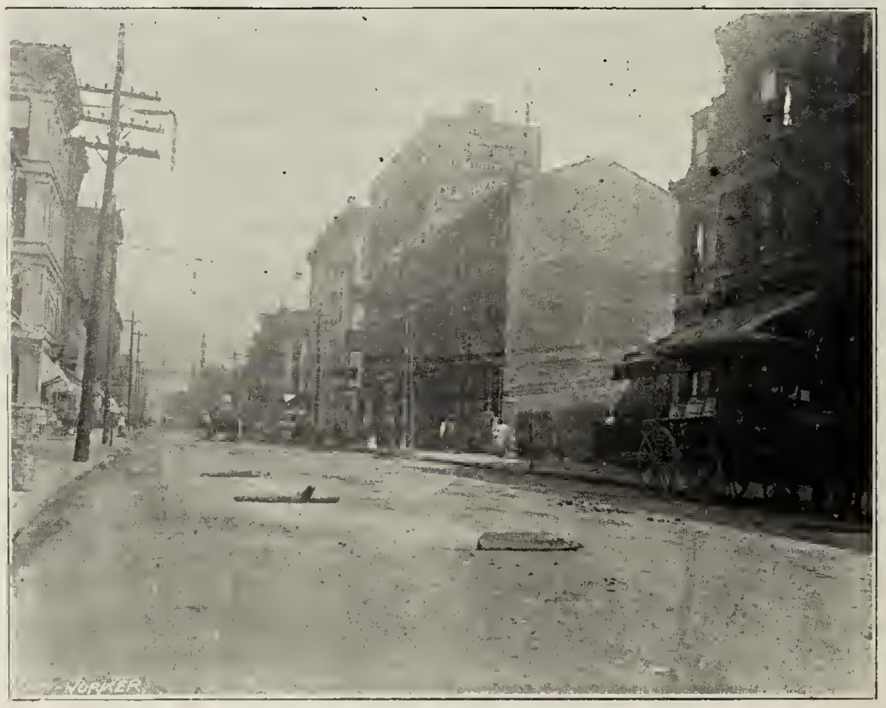
Plans for a general clay-testing laboratory, including an equipment of the various types of brick machines, kilns, etc., were discussed. It is proposed to build up such a department in connection with the State College at Ames.—Boone (Ia.) News.

Written for THE CLAY-WORKER.

REPAIRING ASPHALT STREETS IN CINCINNATI.

The ACCOMPANYING VIEWS represent some of the scenes which may be witnessed most any time on some portion of the asphalt streets in Cincinnati. These particular views represent portions of Plum street. This street, as well as many others, have been repaired a great many times since they were laid a few years ago. The sticks of wood which you will observe in the cuts mark the patches being made in the street. Our asphalt streets do not wear evenly, consequently the repairing is done by cutting out uneven or broken places and refilling them with asphalt. These sticks of wood represent the patches that were being put in this morning. Every portion of the street is gone over in this manner from once to twice every year, sometimes oftener.

A few days since I walked along a portion of Seventh street, and observed that the asphalt was badly worn. I happened along soon after a heavy rain, and found a great many pools of water because of the holes worn in the street. The street seemed to be so badly worn as to almost necessitate the putting in of an entire new coating of asphalt. In certain places, however, I suppose that it will be patched as usual. The asphalt street along the east side of Fountain Square has been repaired a great many times, by which constant repairing it is kept in fairly good condition. Seventh street, referred to above, is not one of our heaviest traveled streets; however, it is a street that receives quite a good deal of travel.



Asphalt repairs on Plum Street near Fifth St., June 5th, 1899.

I examined the small block of brick pavement put down in front of the Chamber of Commerce Building to-day, and found the brick in good condition. These brick have been on the street for a number of years. The same street is laid throughout with the best of granite. We have a large number of excellent granite block streets in Cincinnati. When the granite blocks are first put down they are comparatively smooth, and make a very good street, but our experience with granite blocks is that the corners soon wear off, leaving a rough street, so far as the vehicles are concerned, but smooth as far as the horses' hoofs are concerned. The round or egg-shaped top of the granite block becomes very smooth, so that the horse drawing a heavy load slips a great deal. In real wet weather it is not an unusual sight to see a horse down on our granite block streets. We have never seen a horse slip or fall on any of our brick paved streets. Besides, the brick paved streets wear smooth, are easier kept clean and certainly more durable than asphalt. Quite a number of our hillsides of moderate grade are paved with vitrified brick, and give good satisfaction. So far as I know none of our hillsides are paved with asphalt.

We believe in Cincinnati that No. 1 vitrified brick, properly laid on a good foundation, is the cheapest and best pavement we can put down. One of the troubles we have experienced here is the difficulty in procuring, at a reasonable price, paving brick of the very best quality. We are unfortunate in not having any large vitrified street paving brick plant near Cincinnati. Some of our brick manufacturers claim it is because we do not have the right kind of clay. Others claim that we have the clay in abundance, but that it has not been developed. If we had a good No. 1 paving brick plant within easy reach of Cincinnati, I am sure that many more miles of vitrified bricks would go into our streets. Notwithstanding the difficulty in getting good No. 1 brick at a reasonable price, a great many brick are being put down every year. CINCINNATUS.

INCREASED USE OF BRICK IN BOSTON.

One phase of building operations in this city, as shown by statistics published in our real estate column to-day, is of interest to the general public. An analysis of the figures shows the increased use of brick, as compared with wood, as a building material. It might be supposed that, as the area restricted to brick, iron or stone buildings becomes more nearly built up, and outside the Back Bay district little of it remains unimproved, the relative proportion of new brick buildings to wooden would decline. But the contrary is the case, and much of the new brick construction is in localities where wood might legally be employed, showing that the use of the more lasting and fire resisting material is growing because of its own merits. The fact that so many builders find it more profitable to use brick, even outside the brick limits, goes to prove that an extension of them would not be so burdensome as has been represented, and also the shortsightedness in allowing the better construction to be menaced by the poorer.

Asphalt repairs on Plum St. North of Fourth St., June 5th, 1899.

In May, 1895, only 10 per cent. of all the new buildings for which permits were granted were of brick; the next year the percentage rose to 25; in 1897 it was 23; in 1898, 28, and this year it reaches 32, nearly a third. Much the same showing is made by the first five months of the last eight years, during which the percentage of new brick buildings to the whole was as follows: 1892, 15; 1893, 23; 1894, 16; 1895, 21; 1896, 23; 1897, 20; 1898, 24; 1899, 35. A noteworthy feature of recent construction is the substitution of brick for wood in many cases where the latter might be used for three family houses, although there is still erected a lamentable number of frame three family dwellings. The new tenement or apartment house, that is substantially a building for more than three families, and required to be fireproof by the Boston building law, has nearly disappeared, and where it is seen it is almost invariably a structure six or more stories in height. For anything under six stories the three family house is almost invariably the maximum in this city, having displaced the four-story apartment house so popular before the fireproofing law was enacted. The latter house now thrives in Cambridge and other nearby suburbs where the Boston law does not apply. There is an unusually large amount of important building going on in this city at the present time, hotels, office buildings and warehouses constituting the bulk of it, with one theater and a music hall being planned.—Boston Herald.

ENGLISH CLAYWORKERS IN GERMANY.

THE INSTITUTE of British Clayworkers had decided to pay the German fellowcraftsmen a visit, which idea was carried out last month. On the 19th of May the English guests arrived at Bochum, Westphalia, where a banquet was given them by the well-known firm of Arthur Koppel, and which was attended by prominent German clayworkers, citizens and officials. The affair was a splendid success in every respect. The menu was most excellent, and a lively spirit was kept up by the strains of a military band. Most significant were the toasts and after dinner speeches. The Queen of England was first honored with three hearty cheers, followed by the singing of "God Save the Queen," in which the Germans joined most enthusiastically. Mr. Collier, president of the English association, thanked the hosts for the generous welcome accorded the society, closing with a toast to Emperor William. The same enthusiasm displayed in singing the English song was repeated when all joined in "Deutschland, Deutschland ueber alles." Among the addresses, one by Dr. Faber, was especially applauded. He said that England and Germany have many great interests in common, and that both countries, representing the greatest navy and the greatest army, can do grand things for civilization by acting in harmony. There shall be no war between the two germanic nations. Among other songs "Rule Britannia" was given due prominence.

After an enjoyable Rhine trip the guests were taken to Berlin, where they visited the places of general and also ceramic interest. Another banquet of equal success as that at Bochum was given the honored British clayworkers. In the toasts and speeches the same feeling of blood relationship between the two nations was expressed strongly. The names of Josiah Wedgwood and Frederick Hoffman, so well known to every ceramic worker, were mentioned with pride. In the name of the English society Mr. Higson thanked the German hosts for the many courtesies shown the Englishmen, and with the singing of the "jolly good fellow" the merry company parted at a late hour.

The excursion resulted in a strong feeling of friendship between guests and hosts and in business relations, which are the strongest proof of the impression made.

Advantage of Neighborly Understanding.

Publishers Clay-Worker:

Inclosed please find postoffice money order for $2 for the Clay-Worker for another year. I count this one of my best investments. In reply to your inquiry as to business, I am glad to say it looks much brighter than it has for five years. The demand is increasing, and through a "little understanding" we are getting at least $1 per M more for our brick than we would otherwise. W. C. M.

Washington, D. C., May 19, 1899.

Written for The Clay-Worker.

PATRIOTISM AND POTTERY.

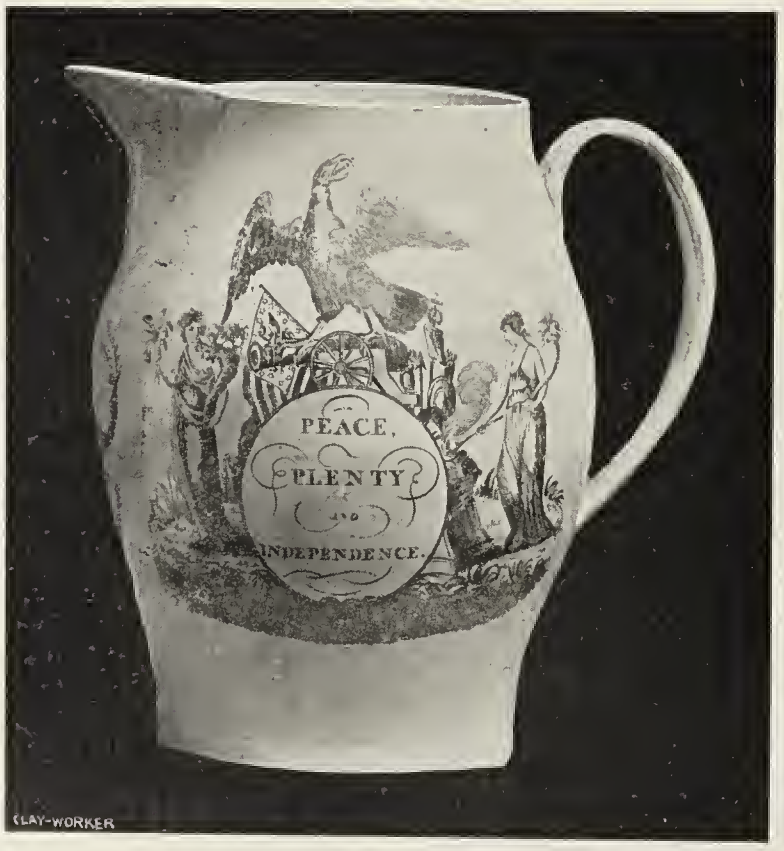
Mrs. Mary E. Nealy.

—Bainbridge and Browne Pitcher—First Side.—

A PIECE OF POTTERY which has doubtless kept alive, and will for years to come, the memory of two most brave and noble officers—Commodore Bainbridge and Maj. Gen. Browne, the former commanding the Washington and the Constitution, and the latter notable in the Niagara campaign.

When Jefferson was made President of the United States of America the disgraceful peace tribute with the so-called "Barbary powers" was still kept up by concessions and gifts. Two of the six frigates still available were used for bearing American tribute to the African robbers. The better sense of America revolted at this semi-slavery, but the interests of commerce seemed to demand it. "No position of our annals," said Mr. McMaster, "is more shameful than the story of the dealings of our government with the horde of pirates known as the 'Barbary powers.' "

But the time and also the man had come. Commodore Bainbridge, with the frigate Washington, was ordered to deliver tribute to the Dey of Algiers. When this business was finished the Dey imperiously ordered him to proceed to Constantinople upon his own private business. The brave captain protested, but was told that the very fact of America sending him tribute proved him to be her master, and that therefore he must obey. Under threats of a volley from their guns he was forced to start upon this odious mission, with the Barbary flag at his masthead. But no sooner had he sailed out of reach of the guns than he tore down the hated flag and ran up the stars and stripes. At Constantinople Bainbridge sent a protest to our Secretary of the Navy, adding: "I hope I shall never again be sent to Algiers with tribute, unless I am authorized to deliver it from the mouth of our cannon."



Peace, Plenty and Independence Pitcher. Liverpool Black Print. Collection of Mrs. Livingston.

He consulted the Sultan with good effect, and obtained from him a royal firman which struck terror to the soul of the Dey. This was Bainbridge's opportunity to assert and maintain the naval authority of the United States. He produced the paper and boldly demanded the release of all Christian prisoners in Morocco, while he also refused any future exactions and all obedience to the Dey. And this bold stand, taken by one brave man, resulted in the breaking up of the detested tribute, as well as in the departure of the released prisoners in his own ship. Bainbridge proved himself as great in active battle as he was in diplomacy, and gained fadeless laurels by capturing the British ship Java while in command of the Constitution.

General Brown's picture occupies the space upon the reverse of the above pitcher. He is always mentioned as "of the Niagara campaign." He held a command of land forces during the battles for possession of the lakes, and his fields of conflict were Chippewa, Niagara and Erie. He distinguished himself in all; but his greatest assistance to the government was in the reorganization of the United States army. He was given chief command of the armies of the United States, and lived many years in Washington, where he died and was buried with honors in congressional burying ground. His monument stands near that of General Macomb, who succeeded him in the chief command of the armies of the United States.

Bainbridge and Brown Pitcher.

—Prebles Pitcher.—

A very large Liverpool pitcher, owned by Mrs. Livingston, formerly of Trenton, N. J.; but now of New York. The decoration is all in black upon the cream pottery. Upon the first side is a large circular print of a naval engagement. Above, "Commodore Prebles's Squadron Attacking the City of Tripoli, Aug. 3, 1804. Below is the following inscription:

"The American squadron under Commodore Prebles, consisting of the Constitution of forty-four guns, two brigs, three schooners, two bombs and six gunboats, attacking the harbor of Tripoli, Aug. 3, 1804. The city was defended by batteries mounting 115 pieces of heavy cannon, and the harbor by twenty-nine gunboats, two brigs, two schooners, two galleys and a zebeck. The city received great damage. Several of the Tripolitan vessels were sunk. Three of their gunboats were taken, and a great number of their men killed."

On the reverse side is a full-length portrait of Commodore Prebles. Beside him, flanked by shrubbery, is a handsome Irish harp surmounted by a crown. On a ribbon are the words, "Tuned to Freedom." Below is a fine eagle and United States coat of arms, with E Pluribus Unum.

Prebles was an Irishman who came to America and entered the naval service. He was brave and loyal to his adopted country, doing excellent service in the war against Tripoli. It was in this siege that Decatur first distinguished himself. The frigate Philadelphia had been captured Oct. 31 by the Tripolitans. Nov. 4 Decatur destroyed the Philadelphia after retaking it in a most daring manner.

—"Peace, Plenty and Independence."—

This is a very handsome pitcher decoration which I think has never been engraved. I have seen the design upon several pitchers, but am sure it has not been printed in a book. Varied designs cover the opposite sides of the pieces. This is the most spirited and independent American eagle I have seen, and the entire design is attractive. The goddesses of Peace and Plenty are very graceful in form, and I think I have seen no design typifying the sentiment of patriotism which I admire so much. The pitcher belongs to Mrs. William S. Livingston, of New York, who kindly loaned it for this engraving. Like all political and naval pitchers, it is of Liverpool ware, with the design printed in black. On the other side is a much printed portrait of Washington.

—Hound Handle Pitcher, 1820.—

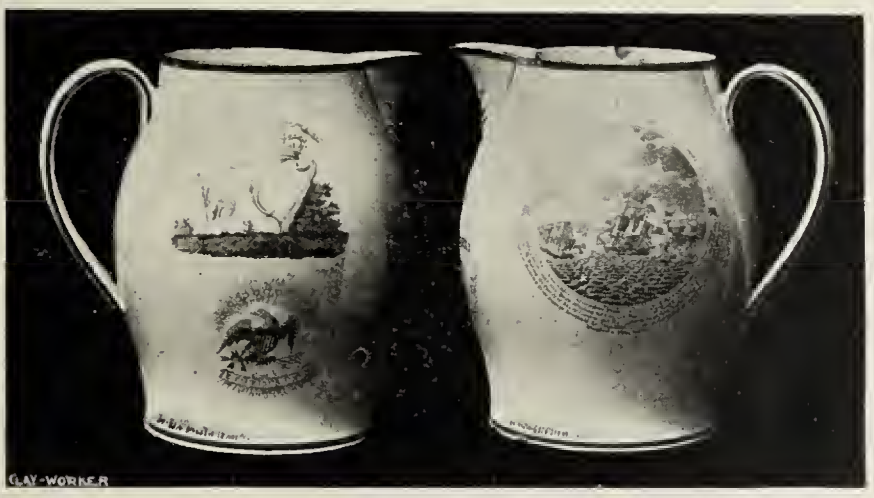
This pitcher was made at one of the earliest potteries in America. The decoration is in relief, and the work very neatly done in the clay, which is brown in the upper half and cream below. The handle is formed of a hound—a device already used in England. It is marked "American Pottery Company, Jersey City," and belonged to Mr. Van Demen, of Albany, N. Y.

Written for The Clay-Worker.

MODERN AMERICAN FRONT BRICK. No. 17.

HAVING TO SOME EXTENT discussed the chemical testing of clays, the writer begs leave to digress somewhat from the subject proper, in order to show in what other respects the application of chemistry may prove beneficial to the clayworker. And let it be said that the application of science to the seemingly minor details could be made the means of saving many a hard-earned dollar. Few seem to have come to the consciousness of this fact.

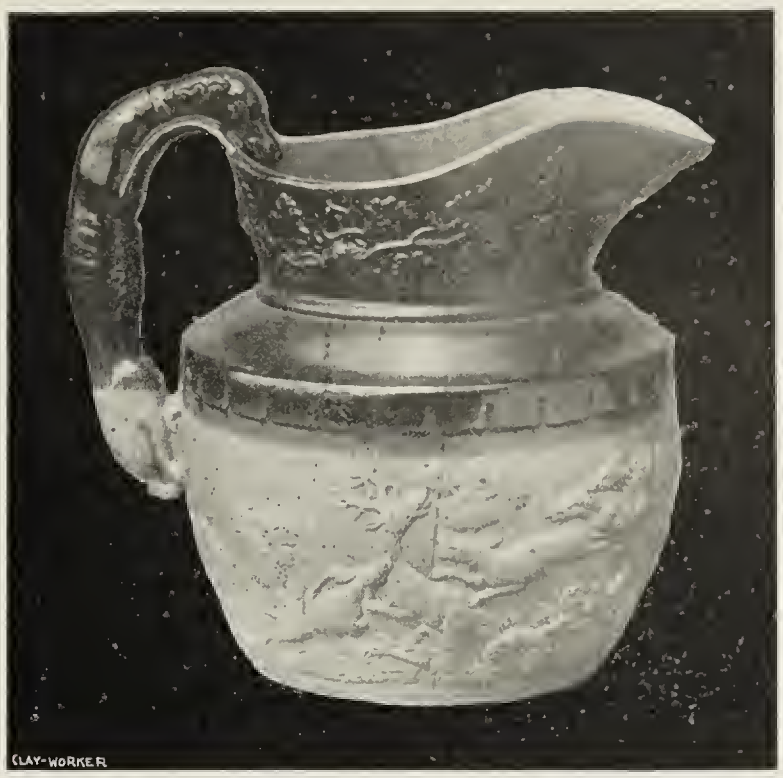
We have repeatedly shown sulphuric acid to be the arch enemy of our craft. It is to the clayworker what phosphorus is to the steelmaker. Even though a man may be fortunate enough to possess raw material which contains no sulphate, yet he may unwittingly introduce it with the water and by means of the coal which he employs. To us it seems of great importance to ascertain the quality of water added during the preparation of clay; to know whether or not it contains any of the obnoxious compounds, and how much of them. Yet how many of our manufacturers ever have had their water supply examined, or, where there is a choice of water, ever have tried to ascertain which is the least contaminated? Years ago some excuse might have been made for this neglect. But at the present time, when it is such an easy matter to detect impurities, no excuse seems to me adequate.



Prebles Pitcher.

It is false economy for the capitalist to employ insufficient labor, in order that expenses may be reduced. This saving in expenditure is only temporary. What seems at first cheap always proves dear in the end. As a matter of fact, the writer knows of places where the water used is rank with sulphuric acid to such an extent that it reacts acid, and yet there is complaint as to the inexplicable efflorescence of the ware. A proper examination by a trained chemist would, in more than one case, result in the removal of the annoyance, and would prove to be profitable to the manufacturer.

The conditions are as bad or worse in regard to the water supplied to our steam boilers. Hundreds of boilers are to-day corroding at an alarming rate—a lamentable destruction of capital—and owing solely to the indifference with which owners regard the subject. Take it in the coal-mining regions, where water is notoriously bad, holding in solution large quantities of sulphate, the life of a steam boiler is a short one. This loss, plus the loss due to the constant repairs and stoppages, represents no small item on the wrong side of the ledger. In the majority of cases the loss is unnecessary, since the injurious substances can either be removed or neutralized so as to deprive them of their corroding power.



The Hound Handle Pitcher, made by American Pottery Co., one of New Jersey's first Potteries.

We know that the most troublesome compounds in feed water are the carbonates and sulphates of lime and magnesia. Carbonate of lime will go into solution in water containing carbonic acid. On heating, the carbonic acid is exhaled, and the carbonate of lime is precipitated, giving rise to scale. The incrustation formed by it is soft and granular, while that formed by the sulphates is hard and most difficult to remove. The sulphates are held in solution at lower temperatures, but, when heated above the boiling point, they precipitate, producing the hard scale so dreaded by engineers. Organic matter, grease (tallow, lard), intensifies the injurious character of the scale and hence mineral oils should invariably be used in the engine when returning the condensed steam to the boiler.

Since prevention is said to be better than cure, it should be our aim to remove the impurities before they reach the boiler, and this is the most modern practice. This is accomplished by filtering off the suspended matter and precipitating the salts held in solution, in purifiers such as are to-day offered on the market, or which the economic man will make at home.

In order to know just what remedy to apply when the injurious compounds are held in solution a chemical examination is necessary. Thus, if one has to deal with sulphate of lime, the most common of all, two ways are open to counteract its injurious effects. By the addition of carbonate of soda the sulphuric acid may be transferred from the lime to the soda, forming the soluble sulphate of soda, which does not give rise to scale, the lime being converted into the carbonate, which produces a soft scale, easily blown off or removed. Again, the sulphuric acid may be removed before it enters the boiler by precipitation with barium chloride. In this case the prime cause of the hard scale is entirely removed. The plant necessary to accomplish this need only be a very simple one, consisting of two connecting tanks or vats, one serving as the precipitating, the other as the storage vessel. Care must, however, be taken not to use excess of barium chloride, since the latter may itself give rise to scale. By means of very simple tests, adding a few drops of sulphuric acid to a glass of the feed water, excess of barium chloride can be easily detected by the formation of a white, cloudy precipitate.

Water holding in solution bicarbonate of lime, magnesia and iron can usually be purified by prolonged heating in one of the modern purifiers, or, in bad cases, by the addition of caustic soda or lime. Trouble due to the presence of grease is removed by the addition of slacked lime and filtration of the mixture. Organic impurities (from sewage) can be precipitated with alum or chloride of iron and filtration.

In all cases the aid of a competent chemical expert should be sought, since this will be money saved in the end. He will prescribe the proper method of procedure for a given case, and will not try to sell you one of those fearfully and wonderfully made boiler compounds which bear the somewhat paradoxical inscription, "Guaranteed to cure all cases of boiler incrustation." It is evident to any one that no boiler compound can be applied to any and all scale formations. It is good policy to beware of such concoctions, since some of them contain tannic acid in the form of oak bark, hemlock, etc., which exert a corroding action upon the boiler plate. Other good maxims to be followed in all cases are, first, whenever possible, the scale-forming substances should be eliminated before the water enters the boiler, and, second, the separation should be accomplished mechanically as much as possible, since it is invariably cheaper than any chemical method.

The subject of sulphur in coal is likewise one sadly neglected by many of our manufacturers. The sole aim of many is to obtain fuel as cheaply as possible, regardless of anything else. Certainly our makers of front and ornamental bricks should pay more attention to this matter. Often several kinds of coal of about the same heating quality are offered on the market at the same price, the point of difference being the chemical composition of the coal, some containing more, some less, sulphur. Now, a little investigation, a small outlay for technical advice, would and should decide which is the best for ceramic purposes. This would be killing two birds with one stone, for, at the same time and with little additional expense, a determination of the carbon and ash in the coal could be made, and the heating value of the coal determined. Many who pride themselves in the low cost of their fuel would not feel so happy if they knew how many per cent. of the weight of coal they are carting to the dumps in the form of ashes and clinkers. At the same time the working of the furnaces, as we all know, is greatly hampered by poor coal, and the ware has to suffer in the end. This is true especially in the manufacture of higher-grade goods.

But we are not yet through with our "sulphurous" topic. It has been repeatedly stated that about the only chemical remedy with positive results is the addition of barium chloride, or carbonate, to clays. This is not a theoretical assumption, but a fact which has been actually tried and not found wanting. When adding one or the other of the ingredients, it is important to know the amount required, so that we can add just enough and no more. The reason for this exactness is the property of the barium chloride to produce efflorescence when used in the liquid form and in excess. In addition to this the question of cost has to be considered. Any competent chemist will determine the necessary data at a reasonable rate, in concordance with good professional work, and will not hesitate to arrange a simple set of apparatus by means of which anybody can control the addition of the barium to the raw material. The writer, for one, will take pleasure in assisting those of the clayworking fraternity who are in need of this particular information. In these days of special kinds of architectural clay ware it is not infrequent that ware perfectly free from the danger of efflorescence is specified.

Another peculiar phase of the influence of sulphuric acid has been very little if ever considered in this country, but, nevertheless, is liable to cause trouble to those manufacturers whose factories are located in densely inhabited districts, or where they are surrounded by tracts of valuable vegetation, parks, etc. In this case the gaseous sulphuric acid is liable to do mischief, destroying plant life within its reach. What if a manufacturer in this unfortunate predicament should be asked to do away with the annoyance? He could do one of two things: He could, by erecting stacks of great height, direct the fumes to regions where they would prove harmless, or he could render the acid harmless by leading it into condensing chambers, converting it into aqueous sulphuric acid. The former is sometimes not an easy thing to do, especially if the works are located between hills. However, let not our brethren be discouraged, even if they get in such straits as this. Science has found ways with which to help the perplexed clayworker.

With the increasing application of colors in architecture it is but a natural consequence that coloring is to play a more and more important part in connection with clay wares. Since this will lead to the use of various ores and oxides whose composition varies quite largely, chemistry again comes into play in examining the various substances, determining their value, and also giving valuable information in regard to their behavior. It is no uncommon occurrence in the manufacture of speckled and gray bricks for the character of the output to change with every carload of manganese. In one instance within the writer's experience, a change in dealers caused a revolution as far as the appearance of the ware was concerned. In place of the even gray, which was the color usually obtained, the new pyrosulite gave rise to blotched, peculiar-looking brick, which, though not unpleasing to the eye, still were far from what was expected. Had an analysis been made of this ore, which would have shown a large part of impurities, a pretty correct conclusion could have been drawn, and no risks would have been taken by using it in larger quantities.

Where decorative effects are obtained by means of slips and glazes, chemical control is almost a necessity for a rational process of manufacture. Since in vitrified or completely fused compositions the intimately fine particles are directly subject to chemical laws, their control must to a large part be within the domain of chemistry. The principles of glazing have been discussed at some length in a previous article of this series, hence it is not necessary to go over the ground again.

Whoever intends to go into the manufacture of glazed ware will find it to his advantage to put up a chemical laboratory, in charge of a person not only acquainted with quantitative chemistry and chemical calculation, but also with the peculiar laws governing glassy compounds. Of course, if the superintendent himself is master of the subject, a considerable saving in regard to salary can be effected, since in this case any general analytical chemist, usually a young person just from college, may be employed, or, if necessary, a bright young fellow might be trained for the work. However, let it be understood that not every chemist can immediately master the principles of the work simply because he is acquainted with chemistry. It is necessary that the special bearing of the chemical and physical laws upon it be studied.

Fearing that the subject might grow on the writer's hands so as to be continued ad infinitum, we will confine ourselves to one more topic only—that of the examination of gases. We know the enormous influence exerted by the kiln gases upon the ware in respect to color and other physical properties depending upon whether they are oxidizing or reducing. We likewise are aware that the consumption of fuel, as well as the maintenance of high temperature, depends upon the amount of air introduced, for it is evident that the more air introduced for the consumption of a given weight of fuel the lower will be the corresponding temperature, or, on the other hand, the more fuel must be used. To produce the best firing conditions for our particular ware with the least amount of air should be our aim. But how are we to control or even to examine these conditions? The laws governing combustion are fixed, and by becoming acquainted with them we may hope to arrive at a more definite knowledge than many of us now possess. Chemistry, with its sister science, physics, has already given us several helps now quite well known—the Seger cones, whose value is being esteemed most highly by hundreds of clayworkers, and the different pyrometers, especially the electrical instruments, which give us such important information in regard to the proper raising and lowering of heat, a kind of data most highly prized in the higher branches of ceramics. But we also possess instruments which tell us the composition of gases, enabling us to determine whether they are reducing or oxiding, whether we are admitting too much or too little air, from which we can judge the prevailing conditions and control the inflow of air as well as the proportions of furnaces, of flues and stacks. To discuss this subject more fully will be the object of a subsequent article.

However, attention is drawn to the fact that we are not altogether bound to the empirical laws of burning. Several instruments have been devised for rapidly determining the constituents of kiln gases, such as the Orsat apparatus, the Bunsen burette, the Bauer and the Cramer carbonic acid meter. These instruments are very simple, and anybody can learn to use them in a short time. Taking the Orsat apparatus, we find that it registers the amount of carbonic acid, oxygen, carbonic monoxide and nitrogen present in the gas. For perfect combustion nothing but carbonic acid and nitrogen should be found; but since this is a practical impossibility, we generally find that immediately after firing more or less of carbon monoxide is present, whose amount gradually decreases as the fire brightens up, while that of the carbonic acid increases for a certain period. Finally, just before the next fire, the oxygen and nitrogen will be at maximum, the carbonic acid and carbon monoxide at minimum. Of course, these general conditions vary with the particular kiln and process, but their main advantage is that they give us specific data—expressing it in figures, from which we can draw definite conclusions. The amount of air introduced is easily calculated from the percentage of nitrogen. Since it bears a constant ratio to the oxygen derived from the air, the amount of air brought in must be proportional to the amount of nitrogen present. Allowing for the still unconsumed carbon monoxide and calling the amount of oxygen required to burn it "0," the theoretical amount of nitrogen required is equal to the percentage of nitrogen plus 3.76x0. The quantity of air actually introduced is to that of theoretically required amount as the percentage of nitrogen found is to the percentage plus 3.76x0. For instance, if, on following this calculation, the amount of air introduced is found to be 500 per cent., while the quantity theoretically required is 100 per cent., we have obviously brought in five times the theoretical amount. But since the admission of air is to a large extent within our control, the firing conditions can be regulated in accordance with the results of the analysis. Of especial importance is the examination of generator gas, where such is used as fuel, and the failures of more than one gas plant can be directly traced to the lack of understanding of the methods of control.

The writer realizes that in starting the discussion of the last topic he has touched a large subject, which needs a more ample treatment, but it has been his endeavor to show that it, like many other things connected with ceramics, can be made subject to systematic procedure based upon the achievements of modern science. AMERICUS.

Written for the CLAY-WORKER.

THE FIRE CLAYS AND FIRE CLAY INDUSTRY AT BOLIVAR, PA. Second Paper.

BY T. C. HOPKINS.

BOLIVAR is one of the oldest centers of the fire clay industry in the State of Pennsylvania, and is said to be the second oldest in the United States, the Mt. Savage works, Maryland, being the oldest.

From all accounts James Glover was the pioneer in the industry. He came from the Mount Savage works, in Maryland, about 1842 or '43, when he discovered the fire clay at Bolivar, where he was engaged afterwards in the fire clay business for more than twenty years, having associated with him several different partners in that time. However, the first bricks made at Bolivar were made by Mr. Glover and his family in a small factory operated by water power on Tub Mill creek. He transported the brick to Pittsburg by boat on the old Pennsylvania canal, which was then in operation. At Pittsburg Mr. Glover himself went out soliciting orders for the brick, and had great difficulty in selling them, but he managed to dispose of the boat load, and they proved to be of such good quality that the people who bought them soon began to inquire for the old Scotchman from whom they had purchased fire brick. Thus did Bolivar fire brick early acquire a reputation in the markets of the State.

Of the different partners that Mr. Glover had associated with him at Bolivar Mr. Kier appeared to be the most active, and Glover and Kier was the firm that is said to have done the largest business in fire brick during the first quarter century following 1843. Mr. Glover was at one time in partnership with Messrs. Baxter and Harley under the firm name of Glover, Baxter & Harley. Mr. Glover is said to have first started works near the mouth of Tub Mill creek, later at two different points up the creek. About 1862 he is said to have sold out his interests to Mr. Thomas Boyd and removed to Louisiana.

Mr. E. Robinson was early connected with the fire clay interests at Bolivar. In 1857, in partnership with Mr. Benny, he constructed the works near the depot at Bolivar, which he operated for several years, and which after being in the hands of several different parties were sold in 1867 to Reese, Hammond & Co., who still operate them. Mr. Robinson went to Black Lick, in Indiana county, where he constructed fire brick works, which he sold in a few years and returned to Bolivar, where he built the Enterprise works, now owned by the Lincoln Fire Brick and Shape Co.

Reese-Hammond Fire-Brick Co.—One of the earlier pioneers in the brick industry, and probably one who has done more than any one else to make the Bolivar fire brick well known throughout the United States, is Mr. James Hammond, who came from Achonry, County Sligo, Ireland, to America in 1851, and after spending one year in eastern Pennsylvania, came to Bolivar in the spring of 1852 and secured employment with Mr. Glover in the fire clay business, with whom he remained the greater part of the time until 1865, part of the time as mine foreman. When Robinson and Benny started their works, in 1857, Mr. Hammond was superintendent. In 1865 Mr. Hammond and his brother Thomas bought the Robinson works from Mr. Leibengood and others, and in 1867 took in as partners Isaac Reese and John McMath, forming the company of Reese, Hammond & Co., which has since become so widely known. It was incorporated as the Reese-Hammond Fire Brick Co. in 1898.

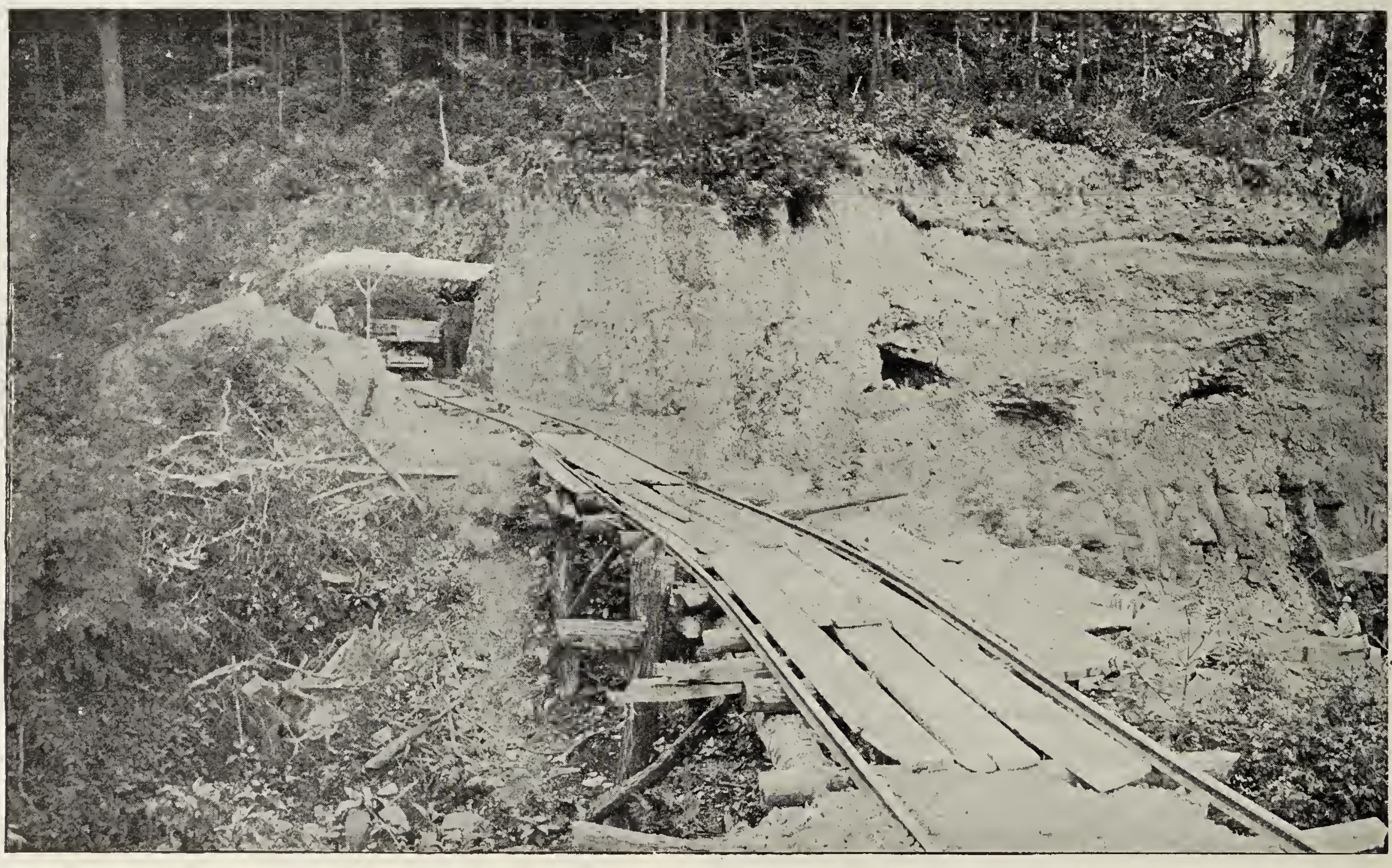
E. R. HAMMOND, Director. J. B. HAMMOND, Director.
JAMES HAMMOND, President.
B. F. REESE, Vice-President. T. M. BERKEY, Gen'l Supt.

Shortly after the organization of the company in 1867 B. F. Reese succeeded John McMath as a partner in the firm. Numerous changes have taken place since that time, and Mr. James Hammond is now the only original member of the firm, which, however, did not change its original name of Reese, Hammond & Co. until 1898. The present personnel of the firm is James Hammond, T. M. Berkey, his son-in-law, T. R. Hammond, E. R. Hammond and J. B. Hammond, his three sons, and B. F. Reese.

In 1872 they built an addition to their works, which they call No. 3, and is so marked on the map. In 1881 they purchased a works that had been previously owned by Thomas Boyd, which now forms their works No. 1, located close to the railroad in Bolivar. In 1883 they purchased the old Glover works, which had been owned immediately preceding this by McCartney, Coulter and Dushane, thus gaining possession of what is probably the pioneer fire brick works of western Pennsylvania.

This company has apparently been prosperous and progressive from the start, having increased their annual capacity from 1,000,000 in 1867 to 30,000,000 in 1899.

They were obliged to wagon all their clay and coal from the mines to the works, distances varying from one-half mile to one and a half miles for thirty years. They recently secured possession of valuable clay deposits and frontage on the West Penn Railroad, in Indiana county, opposite Bolivar, and they now have all their clay transported by rail in individual cars at greatly reduced cost. In 1897 they decided to branch out in a new line of brickmaking, and make vitrified paving and building brick, and they have now completed a new plant for that purpose which they call works No. 4, and which is located opposite Bolivar on the Indiana county side of the Conemaugh river. This is one of the most conveniently situated and best equipped with modern machinery and appliances of the brick works in the State. The company has obtained clay from several different localities, and during the summer of 1897 they were operating six different mines, four of flint clay and two of soft clay, two in Westmoreland county and four in Indiana county. The largest opening, the one from which the largest quantity of material is obtained, is the one recently reopened at the head of the incline above their new (No. 4) works. For certain classes of work they ship in clay from South Fork or Clearfield county.



View of the Flint Fire Clay Quarry of Reese, Hammond & Co., Indiana Mine No. 3. The Clay is the Bolivar Flint clay, which underlies the Upper

Their No. 4 works consist of a main building 64x96, three floors, built of structural iron frame and roof trusses, repressed buff brick walls and slate roof. The first floor is divided by brick partitions into five apartments, namely, the boiler room, the engine room, the pan room, the main machinery room and the office. The equipment of this plant consists of one Raymond No. 777 machine with automatic cutting table, two Victor represses, one Hercules soft-mud brick machine, two 100-horse-power Erie City boilers, one Erie City engine, one 12x20 Blake crusher, two nine-foot dry pans—one made by Stevenson & Co. and one by Phillips & McLaren—with 7,000 pounds rolls, two 12-feet double-gear pug mills, one revolving screen, one double swinging screen, one Richardson hopper and automatic feeder, and a clay bin with a holding capacity of about fifty tons. The shafting is supported by six iron trusses built in solid masonry and bedded in concrete. The arrangement of this building is unique. The office is so situated that the superintendent sitting at the desk can see the coal and clay coming to the works, the pans in operation, and have full view of the engine and all machinery, see the brick go into the dryer and see them shipped from the kilns, without moving from the desk. Their dryer consists of four tunnels of two tracks, each 140 feet long, the total width of dryer being 32 feet and total length 184 feet, including a receiving room of 22 feet and cooling room of 22 feet. The dryer is equipped with one 72-inch disk fan and a five-coil heater, manufactured by the American Blower Company of Detroit, driven by one 9x12 Erie City engine. The cars are steel throughout, with polished roller bearings, manufactured by the Atlas Bolt and Screw Company of Cleveland, O. The dryer building consists of paneled brick walls with wood partitions. The novel arrangement of handling the brick from the dryer to the kilns is that the cars run by gravity, the transfer man riding to the kilns on the transfer car. There are at present ten round down-draft kilns in operation, and about 35,000 brick a day are being made at this plant. A number of new additions and improvements are already contracted for, including one 9-foot dry pan, a new dryer 60x184, to be made absolutely fireproof by the use of brick, steel, expanded metal and cement construction. In the dryer the waste heat from cooling kilns will be utilized, and it will have a daily drying capacity of from 80,000 to 100,000 brick. More down-draft kilns are being built, and from six to ten square kilns will also be constructed, which, when completed, will increase the capacity of this plant to about 100,000 to 125,000 brick per day. There is, perhaps, no other plant in the United States that will equal this plant for natural advantages in material, completeness of equipment, economy in manufacture, durability and beauty of construction and systematic and convenient arrangement.

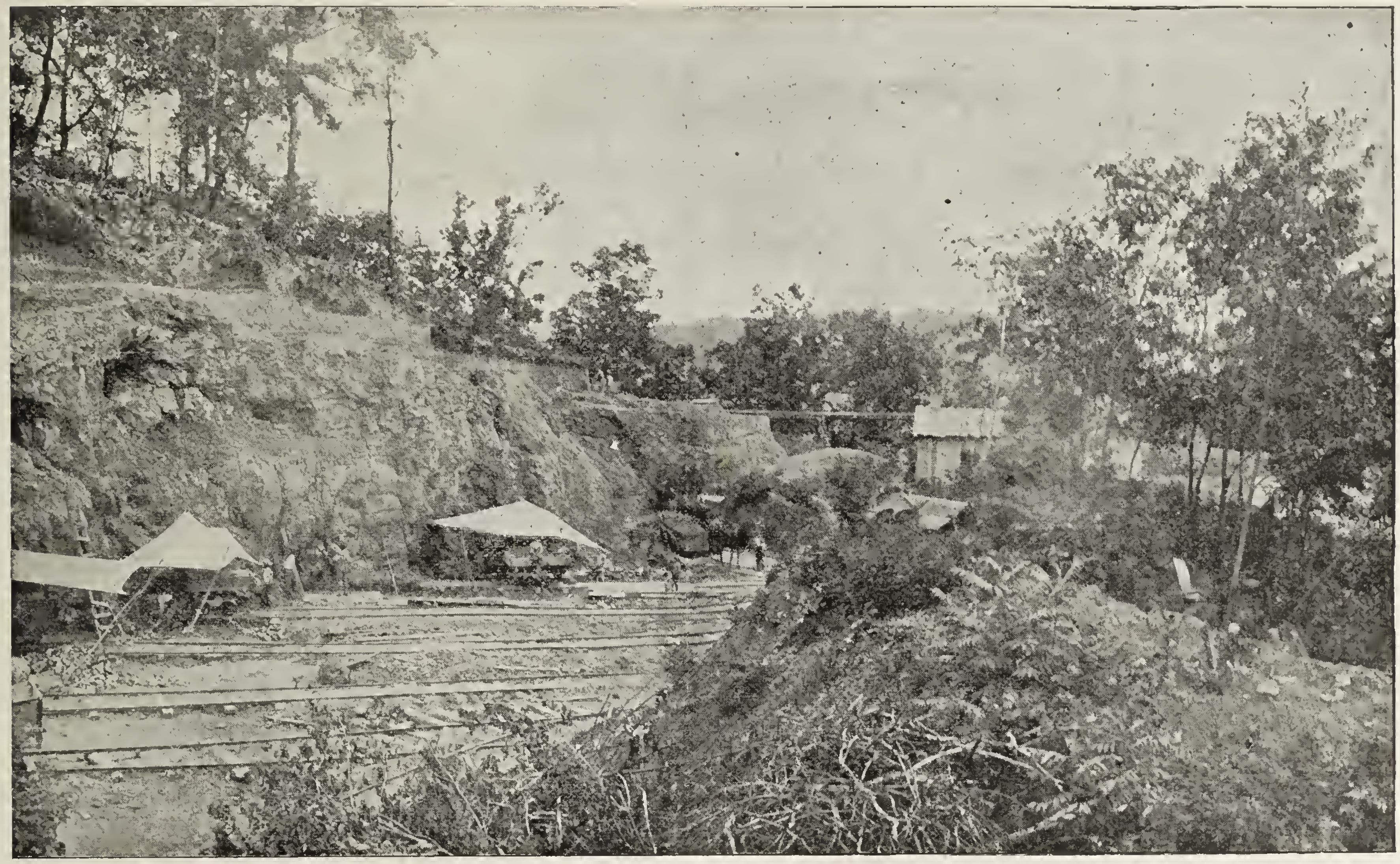
The clay is now delivered at the No. 4 works from the mines by means of an incline and an overhead bridge across the West

Penn Railroad. There is really no handling of the clay from the time it leaves the mine until it comes out in the form of green brick from the machine. The coal is handled the same way.

They are now using in the manufacture of building and paving brick much of the material that was formerly thrown out from the refractory clay.

They manufacture a great variety of refractory products, such as blast furnace linings, high grade furnace brick for open hearth steel furnaces, heating furnaces, soaking pits, and a complete line of rolling mill brick and shapes, also special shapes for Bessemer steel converters, for cupolas, brass furnaces, crucibles, potter's kilns and coke ovens; special shapes for locomotive arches, grate settings, stove linings and a general variety of shapes for any purpose where a high grade brick is required. They now manufacture vitrified paving brick and high grade building brick.

Their largest market is in western and central Pennsylvania, but they ship extensively to New York, New Jersey, New England, Ohio, West Virginia, Virginia, Alabama, Louisiana, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Montana, Washington, also to Canada, and have shipped to South America. The company has for many years shipped fire brick to Montana and Washington, but the freight rates across the continent are so heavy that the company is now meeting competition in Washington from English manufacturers. The present freight tariff is $15 per ton, about $52.50 per thousand on the brick. They find it cheaper to ship to New York and thence by ocean freight to Washington. They also ship from Bolivar ganister in a crude state that is used in Bessemer converters. They also ship crude fire clay for the manufacture of gas retorts.



Freeport or E coal seam, visible on the upper part of the quarry face. The holes on the face are old drifts from which clay was mined years ago.

—Neighboring Plants.—

The Garfield Fire Clay Co., Bolivar, Pa.—The works of the Garfield Fire Clay Co. are situated on the north side of the Conemaugh river, in Indiana county, opposite Bolivar. They are connected by side track with the West Pennsylvania Railroad, over which, and the Central Pennsylvania Railroad, the products are shipped.

The works were started in 1889 by the Robinson Brothers, sons of the Mr. Robinson who started the works in 1857, now owned by the Reese-Hammond Fire Brick Co., and who later, in 1872, started the works now owned by the Lincoln Fire Brick and Shape Co. The Garfield works are still in possession of the Robinson Brothers, and have been in continuous operation since they started in 1889, except about a month in the summer of 1897, when they were rebuilding the works after a disastrous fire. For two or three years the company was known as George H. Anderson & Co., but Mr. Anderson soon withdrew, and the old name was resumed. They have rebuilt on a slightly enlarged scale. The new building has a floor space for 20,000 bricks per day.

They manufacture many kinds of fire brick and refractory material, but their specialties are tiling for locomotives and stove linings. They ship locomotive tiling to many distant points, sending large quantities to the Chicago & Western Railroad for points west of Chicago. They ship tiling as far west as Oregon and east to Maine. They ship some to Cuba, Brazil and China. They have a three years' order for stove linings from one of the large stove works in Chicago.

They obtain the greater part of the clay from their own mines, and get some for special work from Blue Ball, Clearfield county, and some from South Fork, further up the Conemaugh. They obtain their plastic clay from a drift at the works, which runs eastward under the railroad track into the hill. The property immediately adjoins that of the Lincoln Co., in fact the clay from both mines are brought to the surface through the same opening. The clay is only a few hundred yards southeast of the mine of the Reese-Hammond Fire Brick Co., and is the same bed geologically, although it here lies much lower in the hill than in the other mine, owing to the southeast dip of the strata.

The flint clay mine of the Garfield Co. lies about a mile east of their works, which distance the clay is hauled in wagons. It is the Bolivar clay, the same bed geologically as that at the other mines. This mine is said to be the oldest in this vicinity.

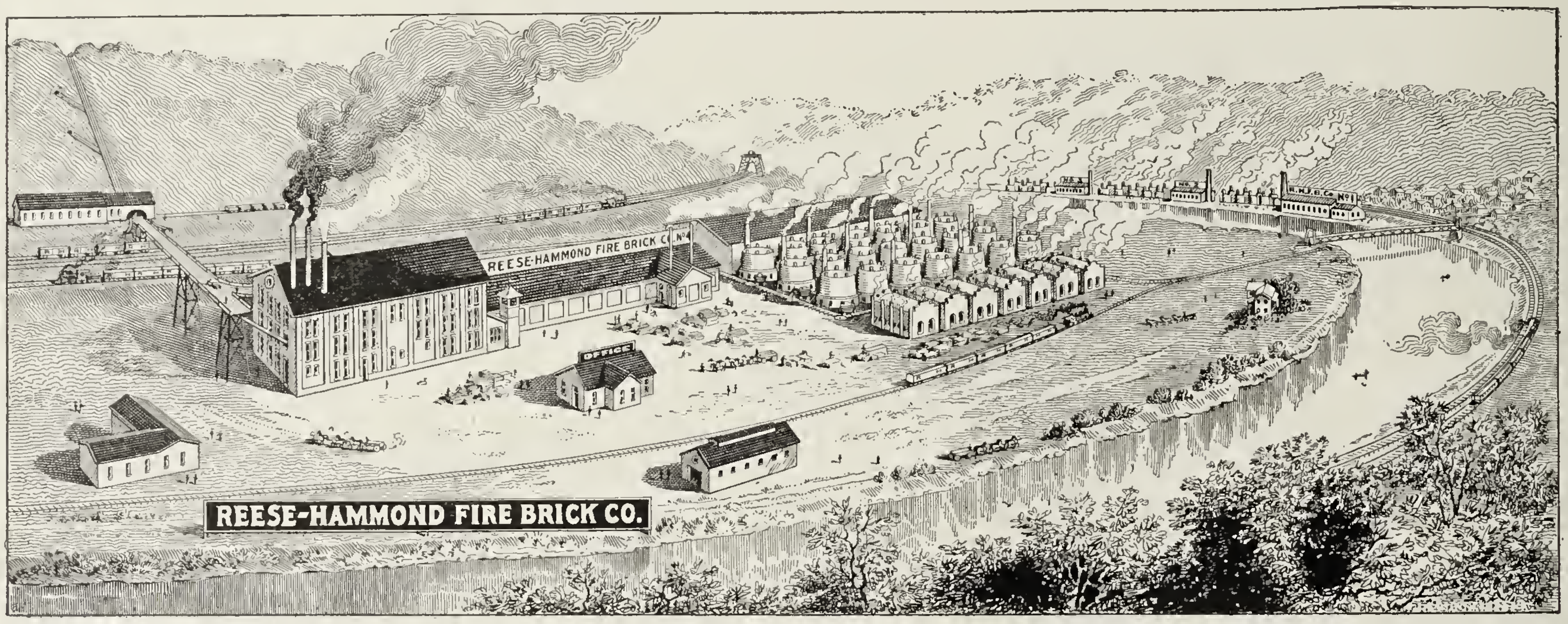
Lincoln Fire Brick and Shape Co.—The works of the Lincoln Fire Brick and Shape Co. are situated on the south side of the

Conemaugh river and the Pennsylvania Railroad, about half a mile above the Bolivar station. The works were established by Mr. E. Robinson, in 1872, and have since been operated by the Enterprise Manufacturing Co., the Bolivar Brick Co., and the present owners, the Lincoln Fire Brick and Shape Co.

They manufacture fire brick and refractory ware of different kinds from clay obtained from their own mines near the works. They obtain the plastic clay from a drift in the hill immediately back of the works, at a level a little above the works. The flint clay is obtained at an elevation of a hundred feet or more above the works, and nearly half a mile distant. The clay is run out on trucks and hauled on a tramway to the head of an incline at the works where it is run on the incline to the crusher. The flint clay (Bolivar) is eighteen to twenty feet thick, and presents a nice appearance as exposed in the mine. There is in places diffused iron oxide, so that some care is needed in selecting the clay. The upper part of the bed, six to eight feet thick, is very dark colored, the "black clay," and is considered the most valuable part of the deposit. In some places only the upper black clay is worked, the lower, lighter colored, less valuable clay, being left for a more convenient season.

The Lincoln Company has an experimental coke plant at the brick works, in which the aim is to save the by-products.

David Coulter's Clay Mines—David Coulter, who resides in Bolivar, has been mining and shipping fire clay from the vicinity of Bolivar for many years. He is at present operating two mines in Indiana county, nearly two miles northeast of Bolivar, on the north side of the ridge from the other clay mines.


REESE-HAMMOND FIRE BRICK CO.
REESE-HAMMOND FIRE BRICK CO.
OFFICE

He has been mining the soft or plastic clay about ten years, working a thickness of five or six feet, corresponding to the upper one of the two beds worked by the Reese-Hammond Fire Brick Co., on the north side of the hill. The flint clay, about 250 feet above the plastic clay, is the Bolivar clay. He works only five to eight feet of the upper part of the bed, which he thinks is a superior quality for gas retorts, for which it is used.

There is an incline from both the soft clay and the flint clay to the tramway at the foot of the hill, which runs down the Roaring run hollow to the side track on the West Pennsylvania Railroad on the east bank of the Conemaugh river. Mr. Coulter ships all his clay to Lockport, where it is used in making gas retorts.

Busy Cleveland.

Publishers Clay-Worker:

Inclosed find my subscription. Business is good here in the building line, or in all lines, for that matter. We have had a shortage of brick, and the road was so bad that we couldn't get teams to haul brick, and we had to raise small orders to $7, but the contract price for large jobs run $5.50, all hard $5.75, face $6, an advance of about 50 cents over last year, and we are paying that all to our men, as we had to raise wages from 25 to 50 cents a day. JOHN WILSON.

Cleveland, O., May 19.

Written for The Clay-Worker

IN AND ABOUT THE BUCKEYE CAPITAL.

IT MIGHT BE of some interest to the brickmakers who visited Columbus the past winter to learn the conditions of trade at the present time. Besides, a few notes on the brickmaking plants in Columbus and adjoining towns might not be amiss. The writer visited the Shawnee and Columbus face brick plants early in May, and found the Shawnee plant, which is under the management of W. D. Richardson, president of the N. B. M. A., a very busy place in all departments, with good prospects for the entire season. The only trouble was a scarcity of cars. As the motto there is "onward and upward," they will soon add the manufacture of glazed brick by the slip process to their present high-grade output. The Columbus face brick plant is running to its full capacity on flashed brick exclusively. Their clay is peculiarly adapted for burning to the richest shades of old gold and bronze of the flashed brick series. They were busily engaged making improvements to their kilns, and were then withholding samples, as they could not fill any more orders than they had at present within any reasonable time. On the 20th of May Logan was visited. The two plants there are running, the third one having moved to Uhrichsville. The Logan Fire Clay Company is making pavers and sidewalk brick. Their fuel is natural gas. It is almost a pity to use natural gas for burning pavers, when the materials for a higher grade ware are so plentifully at hand. The next place visited was the Hayden's plant. They manufacture there a sewer pipe and salt-glazed front brick of a superior quality, besides blocks for foundations. They ship their output principally to the East, and have no stock on hand. Their brick and block are manufactured on a steam sewer pipe press with goose-neck attachment and cutting table of the Bucyrus type, which attachments can be easily disconnected, and twenty, twenty-two and twenty-four-inch dies can be attached for making sewer pipe. They temper clay by wet pan, and mold shapes and ornamentals in plaster molds. They also make all the smaller sizes of sewer pipe on another press on the second floor. On this press they turn out a high-grade fireproofing. They use no tunnel dryers for any of their ware. They have three large floors, which appear ample for all drying purposes. The pipes for heating are all in the basement, where exhaust and live steam is used. The place has a neat and orderly appearance in all its departments. The Columbus brickyards were visited on Decoration day, the first one being Philip Smith's new yard, on South Parsons avenue. He had just got started a few days before. His equipment consists of a Wellington brick machine, with an Atlas engine and boiler. The clay is taken from the bank in carts, and up an incline dumped into the rollers, where it is wet and carried to the machine, one boy tending to the rollers and tempering. They are running along smoothly, when weather permits, not having their drying sheds built yet. They make a very good common building brick, do the watersmoking with wood, and finish burn with coal. Twenty-six thousand will constitute a day's work, and, when they get everything in order, Mr. Smith anticipates no trouble in disposing of all the brick he can make this season. Mr. Smith sends best wishes to The Clay-Worker. Hagerty & Co.'s yard is located on Furnace street, in the southwestern part of the city. They use a Tiffin machine without rollers. The clay is dumped into a soaking pit and wet. Then it is shoveled on a chain conveyer. If any additional water is needed it is turned on the conveyer, and is carried direct to the machine. The drying sheds are well filled, but weather for drying has not been good, which delays them somewhat. Mr. Conrad is the efficient manager on this yard. The burning is wholly under his direction, and I have seen no better burnt kilns anywhere, there being little difference between the third course above the arch and the third course under the platen. Neither is there any difference in any of the arches. They expect to sell all of the output of the season; in fact, Mr. Conrad refused a small order while I was talking to him.

A. E. Dow's yard, in the north end, was next visited. They are running again, after their accident of two weeks ago, when their drying sheds collapsed with nearly 300,000 brick in them. Fortunately no one was hurt. Seventy thousand of the brick were a total loss, which leaves him considerably behind in filling orders. Mr. Dow is confined to his bed with a severe sick spell. They use the Tiffin machine here, and turn out 26,000 for a day's work.

The Isabel and Campbell yards are equipped with Quaker machines, and turn out 13,000 each for a day's work. Mr. Isabel will shut down his yard in a few days. He cannot spare the time from his building contracts that is necessary to give to a brickyard. Mr. Campbell will run his yard during the whole season, as he has plenty of orders. There are quite a number of hand yards here, and nearly all are in operation. All the brick manufactured in Columbus are made by the soft mud process, except those of the Fish Brick Company. They use Whittaker dry press machines, and are running to their full capacity. They use shale principally, and make the best red brick for fronts that are made in Columbus. All the brick clays in and around here burn to a bright red. Scarcely any of it can be used in a stiff mud machine owing, to its sandy nature. None of the plants in Columbus has permanent kilns, except the Fish Brick Company.

Prices here rule about as follows: Run of kiln, $5 per 1,000; fronts, common, $6 and $6.50; press brick, fronts, from $8 up. Ornamentals and shapes are hard to obtain at any price. The Columbus Gas Light and Coke Company is considering the feasibility of using salt glazed vitreous pipe for gas mains. The company had several pieces tested by Prof. Edward Orton. They were subjected to a hydraulic pressure. Some of them burst at ninety pounds per square inch inside, ranging from that up to 190 pounds. They did not burst at that, but that was the limit of pressure on the machine used by Professor Orton for testing clay pipe. If they prove a success, it will increase the demand for sewer pipe. CARBON.

A PECULIAR EXPERIENCE IN BURNING BRICK.

THE BRICKMAKERS of Hackensack, N. J., are puzzling their brains to account for an unusual settle in a kiln of common building brick. The burners in charge have been employed in the same vicinity for years, but recently a kiln settled a foot or more from outside to outside while heating up; at least so say the men in charge. It is an unusual stage of burning to have a settle, and, in a kiln with such a settle, why the lammies which were in use around the props did not fall out is remarkable, as generally on the least shrinkage the props drop out. Nevertheless, there in full sight is the kiln, and the brick men are waiting till the kiln is cool to open it and see what has caused the settle. To judge it by other kilns in which brick have been burned and the number of lammies turned out, there should be a good percentage of swelled. Possibly the kiln ground may have settled some, as a new one was laid this spring, but not a great amount of new sand was put on top of the old hearth. There is a possibility that there are some squashed brick, and still another cause may account for such a tumble, as it was the first kiln and a lot of coal dust was used, and it might be possible that the temperer had forgotten how much he usually put in, and got in more than in other years. He has been around the same pits for years—a dozen to my knowledge, and probably double that number. The foreman has been on the same yard and around the kilns for thirty years, so that one would hardly say that it was a case of not knowing the stuff. The second hand has helped around the kiln for the past ten years, but this is the first kiln which he has had charge of for half a night. The settle did not start in his watch. It is peculiar from any point of view that you may look at it, and it is to be hoped that when it is opened some solution may appear, for a uniform drop of that depth excites curiosity. In the last number of the Clay-Worker I mentioned a mishap to a kiln. The present case is on the same yard, and nearly on the same spot where that kiln stood.

A. N. OLDTIMER.

Crew at Work Repressing Hand-molded brick. Reese, Hammond & Co's Works.

GRASP IT WHEN IT COMES.

There's no use to sit down and wait for success. Luck comes unexpectedly, and a watched kettle never boils.—Exchange.

OBITUARY.

R. B. Morrison, of Rome, Ga.

IT IS WITH an uncommon degree of sadness that we are called upon to record the death of one of our best known and loved members of the National Brick Manufacturers' Association. This time death has invaded the ranks of our honored ones, and taken from us our esteemed friend and brother and former president of the association, R. B. Morrison.

Robert Bruce Morrison was born July 6, 1852, in Butler county, Pennsylvania, and was therefore nearly 47 years of age at the time of his death, which occurred June 2, 1899, at his home, in Rome, Ga.

Mr. Morrison's health began to fail about a year ago—slight symptoms at first—which might have yielded readily to rest and treatment, later were aggravated and more serious, and developed into nervous prostration of a very serious character.

His devotion to duty did not relax with his physical decline, and seemed rather to be intensified, pressing heavily upon him. He continued at his work until he was at last obliged to relinquish his grasp of it. He then sought medical advice and rest at a watering place in Alabama, returning in a few weeks very much improved, and endeavored again to take up his work.

It was soon evident to his friends and those who were close to him that his constitution had been seriously impaired by overwork and too close application to business, both mental and physical.

Late in the autumn he went to Cincinnati and placed himself in the hands of a skilled specialist at a sanitarium. He remained there some months, and again returned home, in some respects very much improved, but he was much reduced in flesh and strength.

There was no time during all his long and painful illness when he was not conscious of all that was being done for his benefit, and constantly regretted the care and trouble of his sickness. He knew his friends and neighbors, seemed glad to see them, but was sorry he could not entertain them as when he was in health, and greeted them cordially until almost the last moment of his life.

Mr. Morrison went South in 1884, and was employed by the Chattahoochee Brick Co. as assistant superintendent, having charge of the practical details of making and burning of all their immense output of bricks, at that time one of the largest in the country. In 1887 he was placed in charge of the Rome Brick Company's works as general manager, and remained with them about ten years. He was also senior member of the Morrison Tramwell Brick Co.

Mr. Morrison is well known to the craft as one of the most prolific writers on brickmaking, having contributed one hundred articles on the practical details of that subject under the title of "Hints on Brickmaking." He was also co-author of the book "Brickmakers' Manual," "A Handbook for Brickmakers," besides many other letters, papers, notes, etc., all of which appeared in the columns of the Clay-Worker, and were widely known and recognized as valuable literature to the trade in all civilized lands.

He was also an inventor of several valuable mechanical appliances, the most widely known being the kiln, which is known as the "Morrison kiln." His whole life has been devoted to the subject of brickmaking, and he was a recognized authority on matters pertaining to the business. No one man has been more successful in acquiring and imparting his knowledge to his brother brickmakers.

He was a friend to everybody, a good citizen, a loving husband, an indulgent father, honored and respected by his neighbers. He served them as mayor of North Rome for two terms. A sincere Christian, he was superintendent of the Sunday school, an official member of the church board, all of which deeply deplore his loss. It can safely be said of him that no man has made a deeper impression upon the community in which he lived in so short a time or was so generally lamented as Mr. Morrison.

He was elected the tenth president of the N. B. M. A. at their convention held in Atlanta Dec. 3, 4 and 5, 1895, serving as such for one year. He was one of the charter members of the association, almost always present at its annual meetings, entering heartily into all its work and recreation with a zeal and zest that was commendable.

He leaves a wife and nine children, seven sons and two daughters, who keenly feel his loss.

Gentle and loving in character, he was well beloved.
His was the smile of a boy, with the manliness of a prince.
Kind of heart, he dispensed with a liberal hand.
Earnest of purpose, his life was one of good deeds.
We mourn for our loss in him.

Sad News for Brickmakers.

Dear Randall—You will find inclosed a check for $2 to cover my annual dues in the N. B. M. A., which should have been paid earlier, but this has been a very trying year on me, with an invalid wife and all the business of our works resting on my shoulders.

Our dear friend Morrison "passed over the river" at 11 a. m. to-day. This will be sad news to many of our craft. It has never been my fortune to meet with a more perfect gentleman or a truer man in all the attributes that "mark the perfect man" in his passing among his kind.

A noble Christian and a generous friend. He was conscious to the last, and held out his emaciated hand to me just an hour before he died.

To me he was more than a business associate, and I am grieved at his departure; and let it be to his friends that he left a legacy that will live as long as merit and worth hold sway in the heart of man.

This will be sad news to Purington, Ittner, Adams and a host of friends throughout the country. Yours truly,

Rome, Ga., June 2, 1899. H. H. McCLURE.

An Exemplary Life—An Inspiration for Others.

Editor Clay-Worker:

You will doubtless appropriate a portion of the space in your journal this month to eulogy of our friend R. B. Morrison, who for so many years contributed to its columns such valuable matter for brickmakers.

In this space I would add my brief tribute to his memory, not only because of the great work he did in the uplifting and improving of the art of brickmaking in our county, but because of the encouragement which his wise words and kindly presence were to me personally.

Just at present I am so absorbed in my own affairs that I cannot command time and attention to express myself as fittingly as I would wish, but others will doubtless send to you words more carefully weighed and chosen, and thus do honor to the man who, perhaps more than any other besides yourself, made The Clay-Worker of inestimable value to our craft and gave it the place which we trust it will ever hold—at the head of our trade journalism, and the exponent of all that is best in thought and practice in the important and progressive art of making building materials from clay.

The first copy of The Clay-Worker that I ever read was in July, 1886, and in it I was much interested in "Hints on Brickmaking, No. 10, by R. Brick," and from that day to this, I have read, I think, every contribution from his pen to your journal, and have in my ceramic library his book, "The Brickmakers' Manual." I first met Mr. Morrison at the second Convention of our National Association in Chicago in 1887, and I remember well how he impressed me by his earnest, sensible and well-expressed remarks. It was my pleasure to meet him in nearly every subsequent Convention, and to have many cordial and profitable talks with him. I thus came to admire him as a man and a brickmaker, and to value his friendly bearing toward me. When I saw him at the last Convention he attended I remarked to him that he did not look any older than when I first met him at Chicago, and I asked him how he preserved himself. He replied that he did it by going to live down in the Southland, near where the famous Spaniard sought the fountain of perpetual youth. Little did he or I think then that we would never see each other again. The announcement of his sad death, though not unexpected for some time past, was a shock to me, and has caused many a pause in my day's work. I shall miss his cordial greeting at our annual gatherings, and the customary interchange of thought and experience.

Probably no brickmaker in America had such a large circle of friends and acquaintances. There are men in our association who do not cultivate the acquaintance nor indeed take much notice of members who are not large proprietors or distinguished by their learning or forensic ability or high social position, but not so Mr. Morrison. There was no brickmaker too lowly or humble to receive his kindly notice and advice, and hence there are all over this broad land to-day men who would acknowledge their indebtedness to Mr. Morrison and who mourn his loss.

I never saw Mr. Morrison in his own home, but I know that his fine character must have shone there as it did abroad upon all who came in contact with him. His death, which came at last as a relief from suffering, must be mourned by his family and lamented by his many friends among us. His life affords many useful and noble lessons that should serve as inspiration to all of us to so live and labor for our own good and the betterment of our fellow-men that when we are called upon to lay down our work and depart hence we may go with the self-satisfied feeling that we have not lived in vain, that the world has been made better by our having lived in it, and that many grateful hearts will mourn our loss and pay tribute to our memory. W. D. RICHARDSON.

An Inestimable Loss to the Entire Clayworking Craft.

My Dear Randall:

Your favor of the 6th, conveying the news of the death of R. B. Morrison, is just to hand. While his feeble health has been known to me for some time, yet it was quite a shock to me to learn that his spirit had passed into the great beyond.

The loss to the craft is inestimable, and the association is bereft of one of its most beloved members, one who labored always for the advancement of its interests, and whose wise counsel was most highly appreciated in all matters pertaining to its welfare. Death has again chosen a shining mark among our membership, and we will miss him more than pen can tell when we gather at our annual lovefeasts in the future.

To those who knew him well (and their names are legion) he was a whole-souled, genial fellow, every inch a man in the highest sense of the term, true as steel to his friends and always kind and considerate with those who differed from nim. The example of his daily life of tireless zeal, thrift and perseverance, is a legacy that should be appreciated by the young generation of brickmakers. In his home life he was an ideal parent and husband, and of exemplary Christian character. Peace to his ashes and tenderest sympathy for the bereaved ones. Very sincerely, JNO. W. SIBLEY,

Treasurer National Brick Manufacturers' Association.

Birmingham, Ala., June 9, 1899.

A Splendid Record.

My Dear Randall:

Yours of the 5th inst., announcing the death of R. B. Morrison, is before me.

While I knew of his illness, and that his recovery was doubtful, the knowledge that he had passed away was a great shock to me. I can conscientiously indorse all that you quote from Mr. McClure's letter, and, indeed, little could be added to his estimate of the life and character of our friend. What more would any one desire to have said of him after he had passed away than that he was "a pleasant gentleman, a true man in all the attributes that make a perfect man in his passing among his kind, a noble Christian and a generous friend?" I could not add one word to so just a tribute to the true and in every way manly character of R. B. Morrison. We shall always cherish his memory and place his name among those to be loved, respected and honored. No class of his friends will more deeply mourn his loss than the clayworkers. Unlike most of us who have spent years in the harness, Mr. Morrison had the gift of being able to put his experience into words, and no writer of our times has written more effectively than he. His "Hints on Brickmaking" are on the shelves of every earnest, practical clayworker in the United States, and are an addition to our literature the value of which cannot be estimated in dollars and cents. I once heard the criticism made that there was little that was new in R. Brick's "Hints," and to that I replied that he who could point out hitherto undiscovered truths in statements we had long been familiar with accomplished more than he who advanced new ideas and theories. One of the elder poets, I have forgotten which, illustrated my meaning when he wrote:

"But words are things, and a small drop of ink.
Falling like dew upon a thought, produces
That which makes thousands, perhaps millions, think."

And the drops if ink which fell like dew from the pen of our friend have certainly made thousands think of their failings and mistakes, and, it is to be hoped, have materially assisted many along the road to success. The old guard are one by one passing away, and each successive loss has the effect of making those remaining seem nearer and dearer to us. No class of acquaintances I have made in a long life average higher in all that makes friendship dear than those I met in Cincinnati at the organization of the N. B. M. A. Will each of them, as he reads these lines, reflect for one brief moment on the possibility of his being the next to be called?

Very truly yours, D. V. PURINGTON

Chicago, June 6, 1899.

R. B. MORRISON, Deceased, Rome, Ga.

A Noble Character.

Editor Clay-Worker:

Again is the brickmaking fraternity called to mourn one of its best members. The inclosed telegram from the son of our old friend, R. B. Morrison, explains itself. Mr. Morrison, as you know, has been ill for nearly a year, but did not give up work until last fall, at which time I was with him for three weeks. Since that time all that medical skill and loving hearts and willing hands could do has been done that he might be spared to us. But it was not to be, and at 11 o'clock on the 2d inst. he passed away.

Mr. Morrison was so well and favorably known to the brickmakers of this country that it would seem useless to say anything here of his life, and yet were I a writer perhaps no one could say more for him than I. Having known him intimately for the last twenty years, I can truthfully say that he was the noblest character I ever came in contact with. He was one of those men with whom you could not become intimately acquainted without being the better for it. Honest and generous to a fault he was the most faithful friend a man could have. What he was to the brickmaking fraternity is well known. To his family, however, is the greatest loss, for he was a model father and husband. To them we can only extend our sympathy. No words can bring comfort at such times. May the God in whom he trusted help them to bear this great grief. ELIAS PETTS.

Shreveport, La., June 6, 1899.

A Place that Cannot be Filled.

Dear Randall—Yours announcing Morrison's death is at hand.

I never could tell any one how much I thought of Morrison. Once or twice in the past I tried to, but I could not do it justice then, and I cannot now, sitting with the mourners.

He made his place in the history of the art, and he made his place in our hearts, and neither place can be filled.

The recollection of his manliness and worth, of his wit and wisdom, remain to us as among the good things of life that we cherish. Sincerely. WM. D. GATES.

Chicago, June 7, 1899.

Loved Even by His Competitors.

Editor Clay-Worker:

I am very sorry to learn of the death of Mr. R. B. Morrison, of Rome, Ga. If I remember correctly, he was a charter member of the N. B. M. A., to which he was always loyal, regardless of personal interests. Mr. Morrison, by reason of his honest, upright, sterling Christian character won for himself the respect and love of all who knew him.

Personally I had a very high regard for his pure character, and counted it a very great privilege to have him for a friend. The lives of such men always leave behind them an ennobling influence, and are not soon to be forgotten.

His bereaved wife and family has our sincere sympathy.

Cincinnati, O., June, 9, 1899. W. A. EUDALY.

One of Nature's Noblemen Called From Work to Reward.

Friend Randall—Your favor conveying the sad news of the death of our friend Morrison at hand. Although this was to a certain extent expected, yet the news caused a pang of sorrow that he, one of nature's noblemen, had been called from work to reward, bereaving the whole clayworking fraternity. All who knew R. B. Morrison liked him, and those who knew him best loved him because they best knew his worth. I knew him well, and valued highly his friendship. As a younger man I was the recipient of many valuable words of advice and counsel, and with scores of others felt the innate warmth of his hearty handclasp when meeting at conventions (if attending conventions does nothing more then bring me the friendship of such men I am well repaid). The world, and especially the brickmaking fraternity, has need of such men, and when, as now, one is taken away we look and wonder how we can possibly get along without him. I think I can safely say that no writer for The Clay-Worker ever got into closer touch with his readers than did "R. Brick," or has been as eagerly read and as often referred to. Knowing him for what he was, I can fully appreciate the loss to his immediate family, and so extend to them my hearty and sincere sympathy in their bereavement. They have lost a husband and a father, and we a brother in the best sense of the term. Our loss is great, but cannot be compared to theirs, and I know that the hearts of the great army of clayworkers are a unit in sympathy for them. He has laid down his arms, for him the fight is over, and I firmly believe he has been welcomed to his rest by "well done, good and faithful servant." Fraternally yours, J. W. CARSON.

Montezuma, Ind., June 10, 1899.

Written for the CLAY-WORKER.

THE NEW YORK MARKET.

NOTHING SUCCEEDS like success, is a common saying. The present condition of the brick trade carries that saying out. The best of weather has been in order ever since the first pit was molded in April. The price of brick has increased instead of falling off, all of which goes to show that when the boom is in force even nature seems to help along.

Turn back one year. The price was away down, and it rained day after day, so much so that the first kilns were composed of nearly all washed brick. The smooth grade did not return cost of production. How could one expect to hold on with a material that would not bring within one-half to a dollar per thousand of what smooth stock was selling for? The Frenchman said, "The King is dead! Long live the King!" The brickmaker of 1899 feels as if he could change that cry somewhat to suit his case by saying: "Hard times are past; the present and the future seem to be very much in my favor; I need have no fear of any reverse." May the bright expectations which many of the brickmakers look for be realized, and each make the best of their yards as money producers and take care of the silver made, as the sunshine of prosperity that is broadcast over the States is not here to stay permanently; it is only a visitor. For how long a period it is hard to guess; several circumstances might make its visit of short duration.

—The American Brick Company—

Works in a mysterious way its wonders to perform. About the only positive information that the parties most interested have is that the company has increased its stock. Whether or not it has bought any yards no one seems to be in a position to state. The report is that it has closed a deal with some by paying a forfeit on the property to be taken next December. Whether or not the full amount agreed upon is to be all cash or part cash and balance in stock is not vouched for by any one. Thus far all property mentioned is up river, and well up at that (I do not mean Salt river). In one case I would not be surprised if the party was the first to get in the "band wagon," as he no doubt has in view a good position when the organization assumes a definite shape. As the parties who are at the head of the movement know nothing about the trade, he would be a valuable adviser, as he is well qualified to give advice on any of the three parts of the business which they will engage in at first, and particularly the brick trade.

First—In selling he is thoroughly up in that part of the trade, as he has been engaged in the sale of his own stock, as well as that of other yards, and is considered by all as one well equipped in that line. His name was mentioned two years ago as likely to be employed by the Consolidated Company as salesman.

Second—As a manufacturer he has had some years of experience, so that his knowledge of economical brickyard management would be of great service.

Third—Having graduated from captain of barge which carried brick to agent, and later to manufacturer, he is in a position to give advice on any part of the trade. He has made a close study of all that portion of the money-making system of the brick trade, and therefore I think he is the one who will stand high in the councils of the trust or company, and the reported sale of his own yard, as well as another yard in which he is interested, probably bears the mark of truth.

—Knowledge Is Power,—

Or is said to be. Why is it that the newspapers which are issued, one may say, among brickyards do not seem to have any knowledge of or go to any one who could give them reliable information in regard to matters which they place before their readers, but publish matter which is absurd? As a sample, one of the papers published in a town on the Hudson, speaking of what the American Company expected to do, led its readers to suppose that the information came from a source which was reliable. It said that in the method of transportation of brick the cost would be reduced. At present the captains of the barges get $65 per month, and each of the crew $40 and board. The captain is allowed so much per man for board, and his own board must come out of the $65 he is paid, so he has to look out that he is not in debt. When a barge is loaded and goes to market she may lay there some days, and, when sold and sent to a berth to discharge, it may be two or three, or in some cases more, weeks before she is discharged. All this time the wages of the captain and crew are going on, as well as the watchman's and wharfage fees. When the new regime takes place, they are not going to have more than two men on each boat; they are going to keep a gang of men in New York to unload the boat, and whoever buys a cargo must unload at once, so that the charges of watchman and the wharfage, which are placed at $1.50 a day, will be curtailed. We will look at the condition of the trade as it exists to-day, and see if the American Brick Company, or any other company, can say, "You must give quick dispatch to my boat." Room around the New York harbor is scarce and costly. If there is any line of trade that delivers stock on its piers, the brick men are the ones which are driven all over. The captain gets his orders to go to such a pier, goes there and finds the berths all full, and he must wait until some of the boats unload, which may be several days. In the meantime the dealer sends carts after the brick. The only way to get them is to pass the brick over the deck of another boat; anything to get unloaded. The boat gets the dock berth, and just as soon as he does the wharfinger tells him that he must not pile a brick on the dock. The dealers may send carts and trucks the next day and take off a hundred thousand. The result is that he has blocked the street around the job and he is not allowed to dump any more, and from that time one cart, which may draw five thousand per day, will be all that will appear.

We would like for the editor who puts such rot in his paper to explain how the American Brick Company, or any other combination, can make the city of New York give them room for quick dispatch, to the exclusion of all other trades. To make the article of interest it also said that the total output on the Hudson was about a thousand million per year, and that the production by the company would not exceed six hundred million per year Possibly not, for they may not control plants enough to exceed that quantity. There will be others making brick as well.

—The Strike a Small Affair.—

Friend Osborne seems to think that the report of the strike at Haverstraw would cause me to guess as regards price. The strike was a small affair; in fact, an echo of last year's trouble as to whether it should be 22,000 or 25,000 per pit. The smaller figures were agreed to, it seems, with the understanding that all the yards along the Hudson were to make the same number per pit; if not, it was not binding on the part of the Haverstraw bosses. If such an agreement was made it certainly should be adhered to, but to enforce it is another thing. Haverstraw is situated differently from all the rest, in the concentration of so many yards at the one place. It would not seem to be good judgment on the part of the bosses to cause a strike, unless there is some of the old spirit of 1898 underlying the present demand. Of that the bosses are the best judges.

Dissatisfaction among the men was general this spring, and wages were the cause of it. As the men were aware that the demand for brick was good and the price advancing, they at once called for more wages. Men were scarce, and first one and then another made a raise, until at present the rate is about as it was five years ago.

—The Color Line—

Seems to have, in one case in Haverstraw, led to a slight difference between men and bosses. Fowler & Son were short of men and employed a number of colored men from Virginia. This did not suit some, and I am of the opinion that the trouble was among some of the old hands who have been on that yard for years. "Allee samee" the colored men were not discharged, but the others went out, and, knowing the bosses so well, I feel sure that it will not be them who will come back.

—Expansion—

Is the cry in the States, and to show how the building operations in the cities of New York and Brooklyn have expanded this year the following figures will be interesting:

Total number of buildings from Jan. 1 to May 25, 1899...2,176
Total number of buildings from Jan. 1 to May 25, 1898...1,277

An increase over last year, in five months, of 899 permits. The cost of said buildings for 1899 was $55,752,402, and, for 1898, $29,316,100, or $26,436,302 in favor of 1899, which makes a good showing as regards the expansion of New York city.

In Brooklyn, from Jan. 1 to May 25, 1899..............1,747
From Jan. 1 to May 25, 1898.............................1,307

An increase of 440 permits in favor of the present year. Cost of buildings for 1899, for the five months, $10,268,743; cost of buildings for 1898, $5,682,291, a difference of $4,586,452, or nearly double, for same length of time, for 1899. Expansion has not hit Brooklyn very hard, but for a residence city she is moving along.

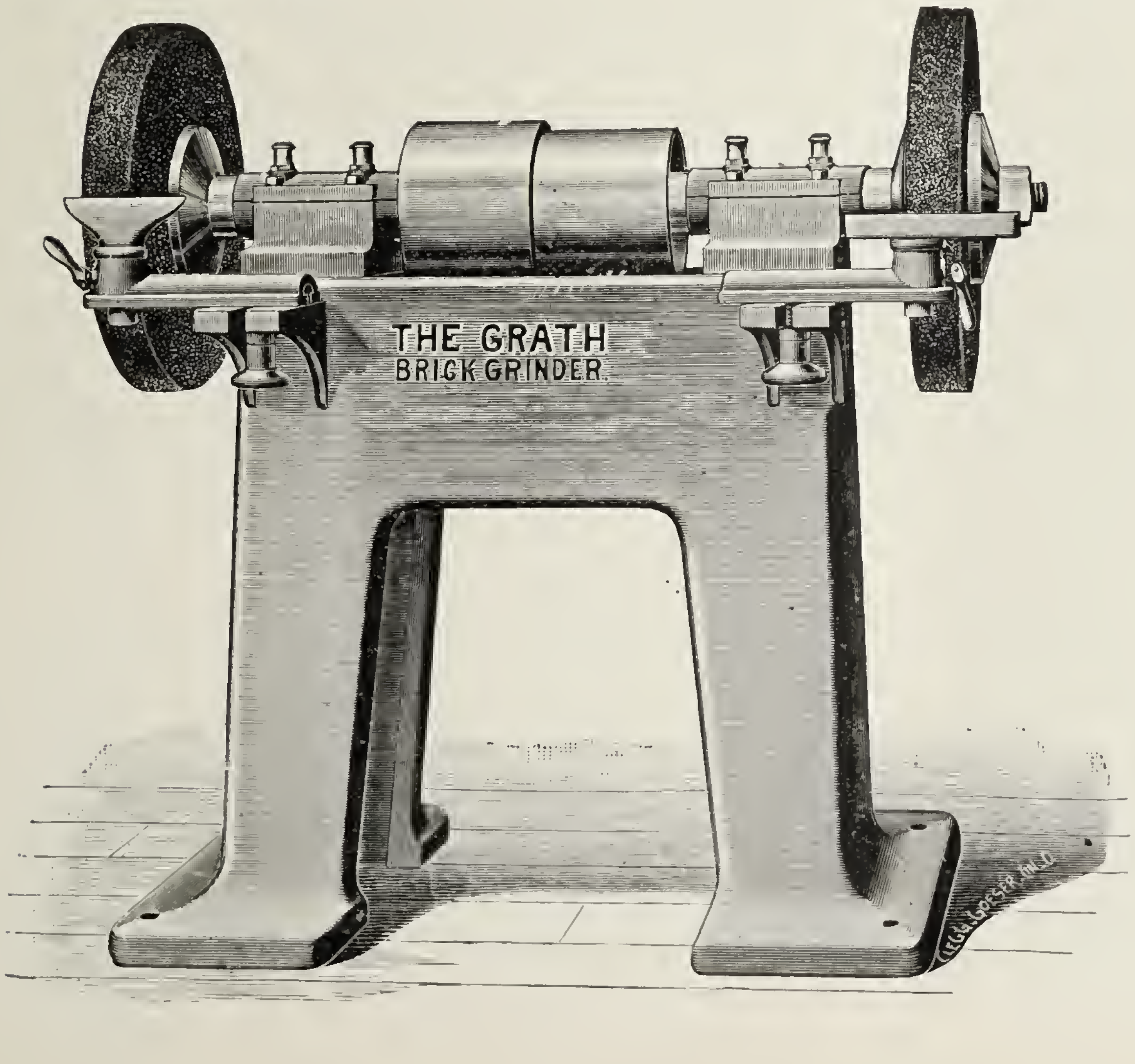
—The Brick Market.—

What more can a brick manufacturer want than a market that will take his stock as fast as sent in and look for more? If he does not rush along too fast the price will probably hold till in June, but, as day follows night, one must expect the market to react about July. The prices at present: Top, $6.62; common, $6 and $6.50; Jerseys, $6 and $6.50; pale, $4.

Hackensack, N. J., June 1, 1899. A. N. OLDTIMER.

A NEW BRICK GRINDING MACHINE.

WE ARE PLEASED TO PRESENT a cut of the Grath brick grinding machine, which is used for grinding arch and radius brick of any kind. As will be seen from cut this machine is a very strong and substantial piece of machinery. Running at the rate of 1,200 revolutions to the minute, there is absolutely no vibration to the frame. The success of this machine comes from the composition of the stones. It required two years of experimenting to get the right material which would answer for grinding all grades of brick either in red, buff, gray, white or fire brick, and will even grind a vitrified paving brick successfully. No brickyard is complete without a grinding machine of this kind, as it requires very little attention and is cheap to operate. Two men can easily grind from 500 to 600 brick per day. This machine is superior to all others from the fact that no white sand is used to aid the grinding. The brick is simply dipped into a bucket of water and held either to the face or sides of the stones, which rapidly grinds off the surface brick. In order to facilitate the grinding when a large portion of the brick is to be removed, a chisel and hammer are used to take off the heaviest portion. Brick ground by this process are free from any discoloration, and no oiling or cleaning down is necessary. One of the best features of this machine is that the price is so reasonable that it is in the reach of all. For further particulars apply to the Illinois Supply and Construction Company, St. Louis, Mo.



What bodily harm threatens the burner when the fire plays away from the kiln wall, and can not be driven from the center?

He is in danger of losing his head.

Written for The Clay-Worker.

CROWNS OF KILNS.

THE WRITER HAS BEEN an interested student of the construction of kilns for many years, noticing, whenever an oportunity offered, the form and condition of their crowns after being used. The tendency in construction undoubtedly has been in favor of flatter crowns, for the low crowns of twenty years ago would be called high crowns now.

The principal cause of failure was the sinking of one part of the crown and the upheaval of the part opposite, which was increased by every firing. It is quite probable that in nearly every case of this kind the crown was not a uniform dome when completed. It has been quite common for kiln builders to lay the brick in the crown without the use of a trammel. They might as well attempt to lay a plain wall without level and line. Not only should a trammel be used to determine the position of every brick as to distance from the center of the crown, but its inclination on a radial line, so that when the crown is complete it shall be a perfectly spherical dome. abundantly strong. In old forms of construction the object was to prevent the thrust upon the skew back, and the almost

In diminishing the height of the crowns we have diminished the liability of the crown to settle on one side and upheave on the opposite side. This is owing to the fact that the sides of the common shape of fire brick are more nearly parallel in the lower than the higher crowns, and the increased compressive force resulting from a lower crown prevents the slipping of the brick upon each other. The force of this compression is resisted by the kiln bands, but we can well afford to make them

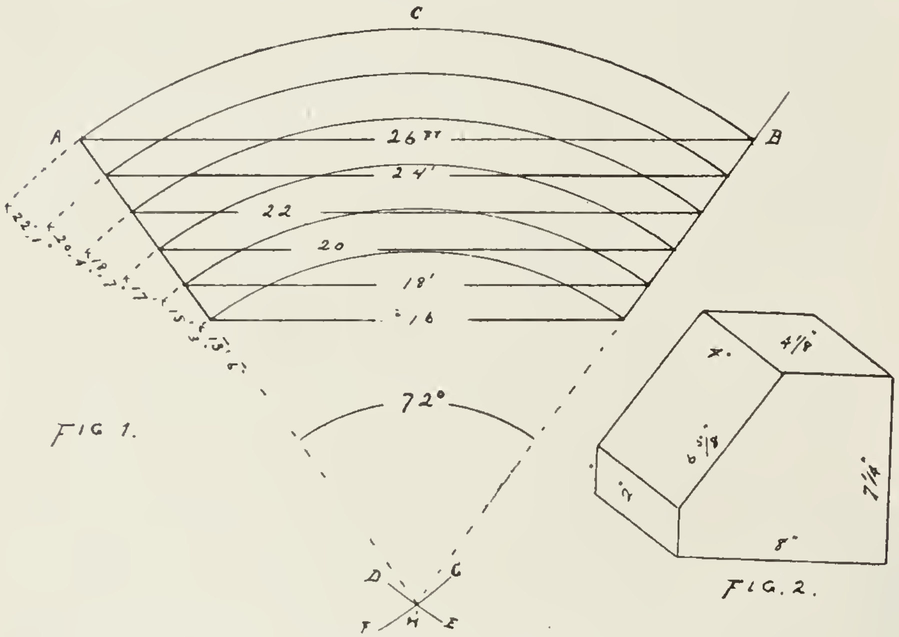


FIG 1.

FIG. 2.

semi-spherical crown was used. While this form might have been more permanent if acted upon solely by external fires, it was comparatively very weak when compared to the lower crowns, which are built to withstand the internal force of heat.

It may be that some builders, in constructing kilns for burning vitrified paving brick, have reduced the elevation of the crown beyond its most durable form. This idea is suggested by the statement in "Flame's" excellent article in the April number of the Clay-Worker in relation to a kiln four feet rise and twenty-six feet in diameter. "We noticed that the crown of the kiln had lost the true line of curvature from a point midway to the center of the kiln." Was this owing to faulty construction or defective form? Until we had ascertained the cause of this deflection and its remedy we would not build crowns of any less rise in proportion to their diameter.

Why not describe a curve in cords and degrees, instead of the terms "rise and run," as though we were laying out a rafter? The amount of curvature we should give a crown to a round kiln is so nearly decided that we ought to be able to establish a rule for its delineation. The following appears to be in harmony with the cases cited by "Flame:"

Let the arch be the arc of one side of a pentagon, one side of which is equal to the diameter of the kiln.

Let us describe such an arc on a cord twenty-six feet long. Draw the line A B twenty-six feet. (See Fig. 1.). To ascertain the radius multiply the length of the cord by the decimal, .852, which gives us 22 feet 1 inch. From the points A and B with such radius, describe the curves D E and F A, and from the point H of their intersection with same radius draw the curve A C B. Then will the angle A H B be one-fifth of a circle—72 degrees. The figure represents arcs drawn on cords of 26, 24, 22, 20, 18 and 16 feet, and the length of their respective radii are shown in figures at the left of the figure. From the rule we deduce the following proportions:

Degrees.	Diameter.	Radius.	Rise.*
72	16 feet	13 ft. 7½ in.	2 ft. 7½ in.
"	18 "	15 " 4 "	2 " 11 "
"	20 "	17 " ½ "	3 " 3 "
"	22 "	18 " 9 "	3 " 7 "
"	24 "	20 " 5⅜ "	3 " 11⅛ "
"	26 "	22 " 1¾ "	4 " 2¼ "

*The rise is not important in delineating the arch of the crown. It is here given so that the reader can more quickly determine how the rule given agrees with the best usage.

We would describe the form of the crown as 72 degrees 16 feet (seventy-two degrees by sixteen feet), or as the diameter may be. One good result of such a uniform system of construction would be that the same form of skew back would answer for kilns of all diameters, and they would be kept in stock by fire brick makers. Fig 2 gives the outlines of a skew back block for such crowns. In regard to setting these, no leveling should be necessary, as all the work of this character should be done in the foundations of the kiln, below the effects of high heat, and the kiln walls built up in level courses.

—The Shaping of Brick.—

All cutting of fire brick should be avoided by making the brick the proper shape. What is the proper shape? A perfect section of the crown? Are we not governed by certain practical conditions that forbid our making brick of this shape? It must be of this shape, if we would lay it in a slip instead of mortar. Such a brick so laid would only answer for a single shape of crown. It would have the advantage of keying such a course by its form, while a common shape must depend wholly on the mortar as a key to each course as well as a key between courses. This form of brick is described in the article before referred to. In the building of a crown you are laying brick around smaller and smaller circles. We believe that long before you reach the apex there will be such a space between the side of the brick midway of its width that no slip will fill it so as to make a close joint. To be theoretically correct in practice, the edges of the brick should be in plains passing through the axis of the crown; but this would require a different shape for every course. We think it very difficult to make a crown brick for a given crown so that when the bricks are laid their contact surfaces shall be sufficiently parallel to each other that simply a slip or wash of clay will make a good joint, and would like to know if any one has really succeeded in doing so. We think it more profitable to consider how the common form of fire brick can be used to the best advantage.

We have in the wire-cut surfaces of a side-cut brick a better surface for bond than a repressed or ground brick would give. They are made quite uniform in thickness, and, when made of good clay and free from laminations, make as good a brick for walls and crowns of kilns as we have in market. Should they be made thicker at one end than the other?

In a 72-degree-16-foot crown the radius would be equal to the length of eighteen courses 8¾ inches each, and the brick, if true, would only have to be one-seventh of an inch larger at one end than the other so that when laid their upper and lower surfaces should be on radial lines.

In a 72-degree-26-foot crown, the radius being 22 feet 1 inch, equal to thirty lengths of brick 8¾ inches long, the radial lines on each side of 2½-inch thick brick would diverge only one-twelfth of an inch in the length of a brick. The brick would need to be only one-twelfth of an inch thicker at the outer end.

Let it be borne in mind that no mortar, or as little as possible, is used between the inner ends of the brick, and it will be quite evident that no extraordinary amount is required at the outer end of the bricks. No more need or should be used than is necessary to bed the brick properly. The writer is constrained to believe that for the purpose of building all the crowns herein described there is no better form of brick than the common fire brick.

TIFFANY.

Tecumseh, Mich., May 15, 1899.

Substantial Evidence of Prosperity in Iowa.

Publishers Clay-Workers:

Inclosed please find draft for $2 for Clay-Worker. The business is better this spring than it has been for years. All the old stock is sold, and we are behind in filling orders. I have put in a larger tile machine of H. Brewer make, and automatic cut off tables, and am now going to put in a fifty horse-power engine and seventy horse-power boiler. I am building one new kiln and enlarging the plant to supply the demand. Send the Clay-Worker right along, I can't do without it.

Hedrick, Ia., May 18, 1899. F. W. H.

Written for the CLAY-WORKER.

THE MANUFACTURE OF FLUE LININGS.

DRYING, BURNING AND COOLING.

FLUE LININGS are made on plunger and auger machines or on sewer-pipe presses. They are made from second-grade fire clay. As their name implies, they are used to line flues. Instead of building chimneys out of brick alone, in late years architects use flue lining inside the brickwork. Many a residence has been destroyed by fire originated through defective chimneys, and in order to make a brick chimney fireproof flue linings are now used by wide-awake people, and the danger of fire through defective chimneys is reduced to a minimum. For that reason premiums of fire insurance companies are lower where flue linings are used inside the brick chimneys. They know that there is less or no danger at all. Flue and chimney linings are made in two-foot lengths, and their inside measurement and price per foot is as follows:

4½ by 8½-inch, per foot	$ .30
4½ by 13-inch	.45
4½ by 18-inch	1.00
8½ by 8½-inch	.45
8½ by 13-inch	.65
8½ by 18-inch	.90
13 by 13-inch	.85
13 by 18-inch	1.20
18 by 18-inch	2.00

Odd pieces, 50 per cent. additional. Above prices are list prices, and the manufacturer only gets a small per cent. of it. They are sold in carload lots at 82 per cent. off. A 4½ by 8½ flue is listed at 30 cents per foot, and 82 per cent. off means that the manufacturer really only gets 18 per cent. of the 30 cents as listed.

After flue linings are made on the press they are conveyed on trucks to the drying floors and dried slow. If dried too rapidly they will crack. They are put on boards, and, if they crack on the end, what can be done to prevent it? Before running the flue out of the press, first run out a ring about two inches wide, and then run out the flue lining. If anything then cracks in drying it will be the ring on which the lining stands. When they are dry, they are set in down-draft kilns, the same as sewer pipe, and the small sizes are set inside the large ones; or, if only large ones are set, drain tile can be set inside.

Car load of Brick Machinery for J. W. Pohl & Co., Gaudalajara, Mexico, from the factory of the Progress Press Brick & Machine Co., St. Louis.

A twenty-eight-foot round kiln will hold $2,500 worth of linings, list price, or $450, selling price. They must be carefully handled in setting, as they chip very easily. They are burned different than sewer pipe. Start the kiln with one shovelful of coal every hour, or eight shovelfuls for eight fire holes. Keep that up twenty-four hours, then increase the coal one-half shovel for the next twelve hours; during the next twelve hours use two shovelfuls, the next two and a half, then three, and so on until finished. When in full fire, give plenty of air over the fire, so as to have the same atmosphere in the kiln as in a pottery kiln. If the fires are closed up, thus making the kiln smoke too much, you get a dirty color on the ware, as you then have a reducing atmosphere in the kiln. When the flues get cherry red and your kiln has too much draft, reduce the draft by lowering the damper, but not more than twelve to eighteen inches, if the main flue to the stack is thirty-six to forty-two inches high. You must have plenty of draft, but not too much, or the heat escapes through the stack too fast, and before it does the work in the kiln. Do not forget to fire open; give plenty of air over the fires, and do not be too much in a hurry; let your coal burn out, and then is the time to fire up again. The fires will tell you that they have eaten up the coal, and they tell you to feed them again. If you fire too fast, they tell you: "Please don't feed us yet; we have not eaten up all our coal; we are not hungry yet. Don't stuff us too much; you might hurt our digestion." Crowding fires hurts the heat digestion of the flue lining in the kiln. If you observe this rule for firing you will get a good burn of uniform color.

How hard must flue lining be burned? To vitrifaction? No. Just so hard that when you draw a trial piece from the bottom you can hardly cut it or scratch it with your knife; then they are hard enough; otherwise they are too soft. They must be hard enough to stand shipment, and they should be stored in sheds to prevent them from getting wet, if they are not shipped in cars direct from the kiln. The cooling can be done very rapidly, as they do not air-check as easy as vitrified ware. When the burn is finished, drop the damper about two hours after the last fire. Let the kiln stand twelve hours. Have the fire holes closed during this time. Then pull the damper plate off and give full back draft; open door and fire holes, but do not open holes in top of kiln. You can take the doors down gradually during twenty-four hours, and your kiln will cool off in three days from the time of finishing. The second day after finishing open the holes in the top of kiln, and there is no danger of air-checking. The reason for letting the kiln stand twelve hours after finishing with draft shut off is this: You will get the whitewash off (which looks so bad) during the annealing process which takes place during that time, and you will get the nice cream color, which looks fine and is so much desired.

FINNIAL.

DRY PRESS BRICK MACHINERY FOR MEXICO.

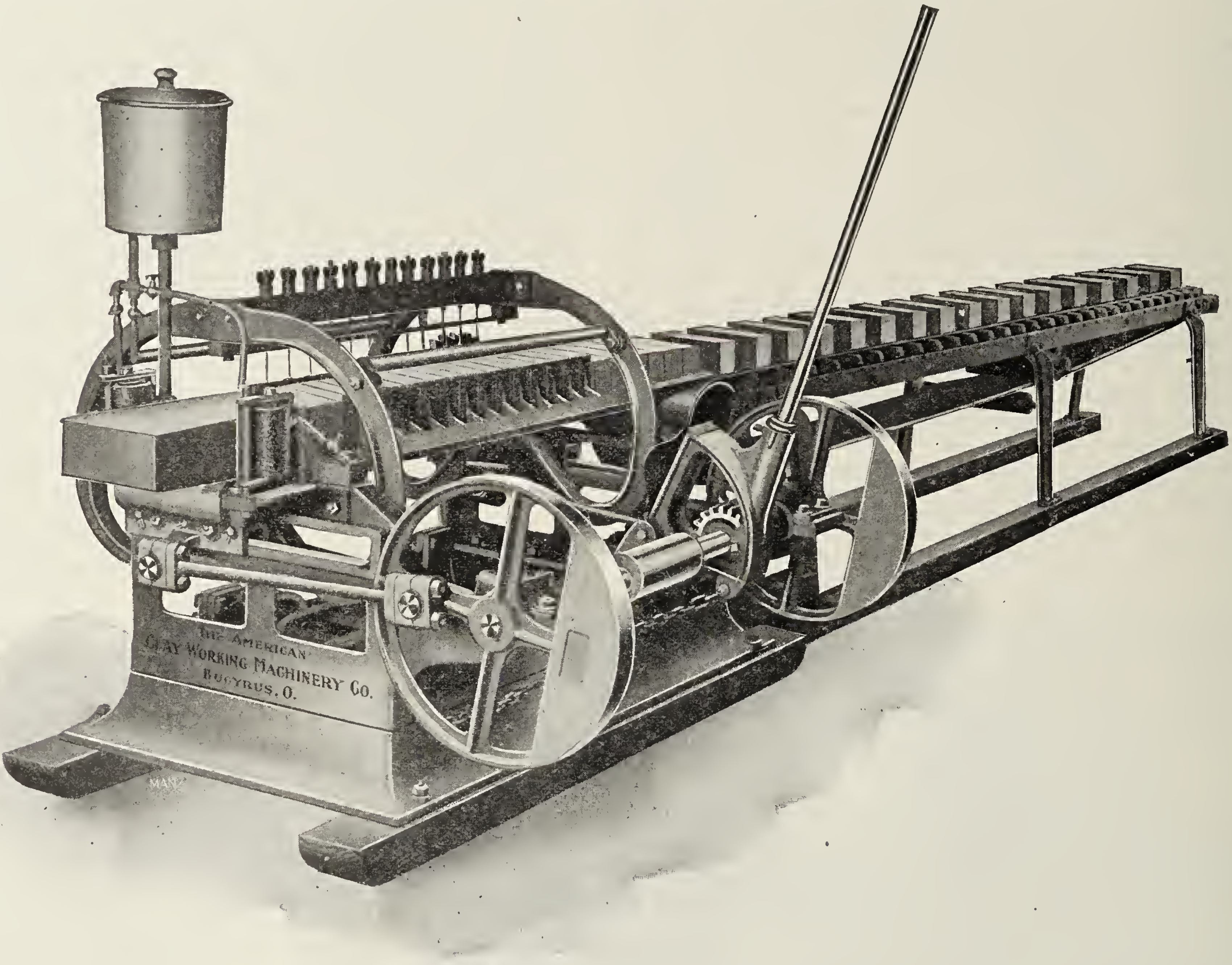
THE INVENTIVE GENIUS of Yankees is now well known and admitted the world over. American machinery, by virtue of skillful designing and perfection of material and workmanship, has won its way into almost all the markets of the world. It is not surprising, therefore, that our next door neighbor, Mexico, is a liberal patron of our manufacturers, for, albeit most of her labor is now performed by hand, Mexico is progressive. An evidence of this is afforded by the establishment of modern press brick plants in a number of Mexican towns. One of the latest that has come to our attention is being erected at Gaudalajara by J. W. Pohl & Co., who have purchased a complete equipment from the Progress Brick and Machine Co., St. Louis. We present a picture of a carload of their machinery as it was about to start on its journey south. Messrs. Pohl & Co. propose to have a thoroughly up-to-date brick plant and to make a fine quality of building brick. We will have more to say of them when the plant is fully under way.

ROOFING TILE COMPANIES CONSOLIDATE.

The Celadon Manufacturing Co., limited, the extensive manufacturers of roofing tile, announce that they have purchased the plant, property, patents, good will and merchandise of the Chicago Terra Cotta Roofing and Siding Co., of Ottawa, Ill., and will operate that plant in connection with their works at Alfred, N. Y. The business of both companies will be directed through a general office at Chicago. Both plants will be operated jointly, Mr. A. B. Clark, long and favorably known as superintendent of the plant at Alfred, becoming general superintendent, with headquarters at Ottawa. They will manufacture all the forms of tile heretofore made by the separate companies. Mr. E. J. Hess, late secretary and treasurer of the Ottawa company, will be associated in a similar capacity with the consolidated concern. Celadon tile are now recognized as a standard roofing material, the equal of the best the world over, and, with the increased facilities which the added plant will give, they can meet any demand that may be made upon them for the best roofing material in the world.

OSCILLATING RECIPROCAL DOWN-CUT TABLE.

NO TABLE of modern invention has so many features of superiority as the new oscillating reciprocal down-cut table which the American Clayworking Machinery Company, of Bucyrus, O., has just put upon the market. Its operation is easy and without strain, which reduces the labor and adds life to the table. The cutting is done on both the forward and backward movement, and always in a down shearing direction, which insures the perfect cutting of brick.


THE AMERICAN
CLAY WORKING MACHINERY CO.
BUCYRUS, O.

New Oscillating Reciprocal Down Cut Table.

The cutting frame has two movements, reciprocating forward and backward, as will be seen by a study of the cuts, the wires always moving in a shearing, downward direction. Just before entering the bar of clay the wires take a downward motion, which is maintained at an increasing angle until the cut is completed, when, by an oscillating movement, the cutter frame is straightened and the wires are in a vertical position, ready for the return cut, which is also in a downward direction. This perfect movement is secured by the position of the respective cranks, as seen in the cut. The advantages of this movement are many. The cutting wires passing through the bar of clay in an angular, downward and shearing direction insures a perfectly smooth cut. On account of the combined movement of the cutting mechanism the wires are not strained to their utmost limit and consequently last much longer. The oscillating movement gives the machine a more even balance, as the reversal of the direction is easy and gradual, which insures a smoothness of operation and prevents any destructive jar or jolt.

The cutting bars being driven by cranks at both ends of the machine insure a better alignment and a more perfectly rigid, square and even cut.

This machine is built on new designs throughout, and will withstand the wear and tear incident to the speed necessary for increased output.

The table is provided with two stationary abutment plates, which keep the column of clay moving straight. The column of clay is carried from the die to the cutting table on a short, polished plate, which is provided with a lubricating roller at each end. The two rollers revolve in an oil reservoir, and are held firmly against the under side of the bar of clay by springs, thus spreading over the surface of the bar a thin coating of the lubricant, which prevents the rollers from becoming sticky. There are also two perpendicular rollers which lubricate the sides of the bar of clay. Oil for all rolls is supplied from a tank, the flow being nicely regulated. The backs of the abutment plates are open, which prevents clogging by clay sticking to the wires. The table is built of iron and steel, all working parts moving on compound, anti-friction rollers. The machine is built with the off-bearing belt, which saves a great deal of labor. Capacity, from 2,500 to 4,000 brick per hour. Weight of table and ten feet of off-bearing belt, 2,600 pounds. Floor space, including ten feet of off-bearing belt, 5 by 15 feet.

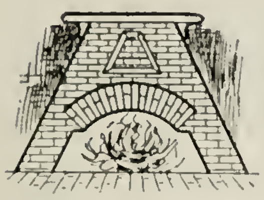
CLAYS WANTED FOR PARIS EXPOSITION.

It ought to be generally known by the clayworkers and dealers of the States that a collection of economic clays is being prepared for the Paris Exposition of 1900.

The work has been intrusted to Charles F. Binns, principal of the Trenton Technical and Art School, and he is now engaged in gathering samples of every description of clay. Mr. Binns will be glad to receive samples of representative and typical clays from all parts of the country. Each specimen should weigh about five pounds, and should be distinctly marked inside the package. The following particulars should be given with each clay: 1. Locality, State and county. 2. Extent of deposit, in acres. 3. Name of firm exploiting or using clay. 4. Value at the bed or mine. 5. Uses.

Packages should be addressed to Charles F. Binns, Ceramic Art Co., Trenton, N. J.

PACIFIC COAST NEWS.



FURTHER IMPROVEMENT in the demand for brick and tiles is to be noted this month. Sales have been larger than for several months, but there is much complaint among the manufacturers that the prices realized were not what they should have been. Fire brick have already advanced in price, and a similar movement is expected in red brick.

Mangrum & Otter state that the general revival in the building trade has given them an exceedingly good trade in all kinds of fancy tiling. They have now arranged a handsome display of brick mantels at their new Market street stand.

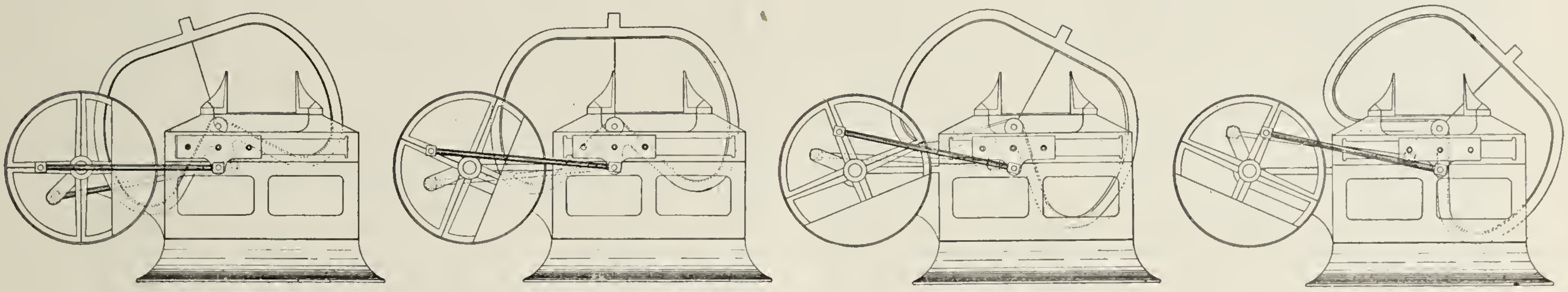
N. Clarke & Sons report a large output at their Alameda factory. Prospects are fair and the present trade is good, although prices are very low.

The Henry Cowell Lime and Cement Company notes an improvement in the sales of fire brick. The outlook for buildings is on the improve, and large fall sales are anticipated.

The H. & T. Holmes Lime Company is doing a good business in imported brick. It is shipping large quantities of lime to Honolulu, where its trade is good and increasing. From the reports of architects, a splendid trade is expected there.

J. H. Miller & Sons have turned out 300,000 brick from their kiln at Whatcom, Wash., and will make 2,000,000 this season.

The Washington Brick, Lime and Manufacturing Company has recently increased the capacity of its lime works at Springdale, Wash., to six hundred barrels daily, and has built warehouses and made improvements at its brick works at Clayton, Wash.



Sectional Views of the Oscillating Reciprocal Down Cut Table.

The manufacture of brick will commence at Haines, Alaska, at once. A party of five men has commenced operations. A superior quality of clay has been discovered and preliminary tests develop that a fine quality of brick can be made.

The Pacific Clay Manufacturing Company, of Corona, Cal., has the contract for making twenty miles of eighteen-inch pipe, which is to bring water from Yucaipe Valley to Redlands, Cal., twenty miles distant.

The Ogden Pottery Company, which was recently incorporated at Ogden, Utah, has started operations. John S. Smith, president and manager of the Enterprise Clay Company, will also be president and manager of the new concern, though both are to be separate enterprises. The clay company makes sewer pipe and tiling, while the pottery company will manufacture all kinds of pottery. The Z. C. M. I., of Salt Lake City, Utah, has given the company a big order, and may handle the entire output if the goods prove satisfactory. Most of the clay will be brought in from Hilliard, on the Union Pacific, whence much of the clay for the Enterprise Clay Company is brought.

A power house is being erected for the brick plant at Waverly, Wash. The company operating this plant expects to engage in the business permanently, as a number of buildings are contemplated in that section, and it is believed there will be a brisk demand for the brick.

The Fullers' earth mine, located west of Fairview and about eight miles from Mount Pleasant, Utah, is attracting considerable attention just at present. It has been known for some time that the product of the mine was of a first-class quality, but the owner, William Young, of Fairview, has been financially unable to develop it or get it on the market. W. H. Woodring, of Mount Pleasant, has become convinced of the great value of the deposit, and has lately secured an option on the property. Some Salt Lake parties and an Eastern firm are figuring on using the earth in large quantities.

Charles E. Stream has discovered a clay deposit on Cajon mountain, San Diego county, California, and it is probable that a pottery factory will be established in the city of San Diego in the near future.

The Redd-McCormick Brick Factory, at Fairfield, Wash., has completed all necessary arrangements and has commenced the manufacture of brick. The capacity of the plant is from 35,000 to 45,000 brick per day. Manager M. S. Burk states that the plant will be run to its fullest capacity to meet the demands of the customers.

Charles Groves, an old resident of Bountiful, Utah, and who has been engaged in the brick business there for some time past, is reported to have left for parts unknown, leaving behind him debts to the amount of about $8,000, with security for about half that amount. Mr. Groves had been making some improvements at his brickyards by putting in improved machinery, and became discouraged at dull business and quit.

A kiln containing 100,000 brick has just been finished at the brickyard of the Portland Clay Company, Portland, Ore. A monster kiln of 500,000 brick is in contemplation at the yard, and probably will be set up within the next few weeks.

Bullock, Hancock & Lapointe, of Nelson, B. C., have received contracts for supplying 500,000 brick for local builders of that section. An order for improved brick machinery has been placed in Spokane, Wash.

A brickyard is being opened up on the Carter tract, San Bernardino county, California.

The Holt & Gregg brickyard, at Anderson, Cal., has commenced operations. Many improvements have been made in the machinery this year, the brick molding machine being run by steam power instead of horse power. By this means 25,000 brick a day can be molded. The company will manufacture several million brick this season, as it has many large orders to fill.

E. F. McCafferty & Bro. have opened a brickyard at Red Lodge, Mont. They contemplate burning over half a million brick this summer.

The fire brick and pressed brick departments of the Anaconda Copper Mining Company, situated at Anaconda, Mont., have been started up. The department where they manufacture red brick has not been started up yet, and it is a question if such brick will ever be manufactured at the old stand to any great extent, because the desirable clay near the works is about exhausted, and a haul of clay a mile or more is not practicable for economical brickmaking. A mile or so up the valley there is a small mountain of good clay, and to that point the brickyards will be moved sooner or later.

A brick plant has been installed at Trail, B. C., by Messrs. Luff and Trueswell. The plant will turn out about 20,000 brick daily.

SUNSET.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

ABOUT ROOFING TILE.

Publishers Clay-Worker:

Will you please give us your opinion on the manufacture of roofing tile, particularly in the Southern States? We have a Spanish roll tile, which, we are told, is an improvement on the so-called Spanish tile that is now on the market—does entirely away with the use of cement and adjusts itself better.

As you are in a position to judge from observation, will you kindly give us your advice on the following questions, viz.:

First—Is roofing tile gaining in favor since its recent introduction?

Second—What is the most popular tile in use—Spanish roll, interlocking, or the flat shingle tile?

Third—Who makes the "Conosera" tile, and is it patented?

Fourth—With an experienced tilemaker, and tile at about $6 per square, weight about 650 pounds per square, do you think there could be an immense field worked up for them to compete with slate? And will they not bear the cost of shipping for as long distance as slate?

Fifth—Is tile the best of all roofs, especially for the Southern climate, and is the demand growing any in the South?

Sixth—Do you think it would be a fairly profitable investment to begin this, in a small way, with an experienced tilemaker, and incorporate fireproofing, front brick, etc., until the inevitable mistakes were remedied?

We have a good red-burning clay in the city, and with it washed there could be a sound, well-shaped tile produced.

Chattanooga, May 22, 1899. J. H. WELCH.

About Roofing Tile—A Reply.

Editor Clay-Worker:

Roofing tile originated in the "Sunny South" of Europe, or in the still sunnier land of Egypt. It is older than written history, unless that history was written upon the very material of which it is formed While it was difficult to introduce it in the northern countries of Europe on account of the climate, and the inability to make a good tile that would stand that climate, its adaptation to the southern countries has never been questioned, and it has been for many centuries the roof covering for the houses of the poor as well as the mansions of the rich.

It has an advantage over slate in being more refractory of heat, of less weight per square, and having a great variety of more beautiful forms of a more pleasing color.

We cannot write understandingly of your "Spanish roll tile, of improved forms." Spanish tile have been made in a great variety of sizes and proportions, and in regard to workmanship by hands unskilled in any art and by those who were able to make them very accurately of beautiful form and color. Wherever the Spanish flag was carried the Spanish tile were known. Your returned soldiers will tell you of their use in Cuba, Porto Rico and the Philippines. If you visited the Columbian Exposition you saw them on the California building and the convent. We presume they were called "Spanish" because they were so generally introduced by the Spanish people in the countries conquered by them. But we are of the opinion that they were older than the Spanish nation, for the tile of single curvature was on the Acropolis of ancient Greece. The "improved Spanish," as we know it, is of double curvature and is made in far better form for close fitting, but its ability to exclude a driving rain may well be questioned, for our best manufacturers specify the use of cement with their Spanish tile. Much depends, not only on their fitting well together, but on the pitch of the roof. Tiles for common roofs should be so made and so laid as not to require the use of cement to make them water proof.

We will endeavor to answer your questions in their order.

1st. Roofing tile are gaining in favor.

2d. It would be impossible to say which is the most popular tile. The Spanish tile are used more than any other for towers and meet with great favor for the roofs of public buildings. The Ludowici is made in different forms and presents an attractive appearance. On the roof of the German building at the Chicago Columbian Exhibition it was greatly admired, and it still may be seen, as the building was made permanent. The shingle tile are expressionless, and the only advantage they have over slate is the color.

3d. The Conosera tiles are made at Alfred Center, N. Y. They are patented, and so also are the Ludowici

4th. We think your location very favorable, and that the business under proper management would become extensive. As to transportation, the interlocking and the Spanish are lighter per square than slate.

5th. We consider a tile roof the best of all roofs for any building and for any climate.

6th. It would, no doubt, be the most prudent course to pursue to begin in a small way in connection with some other clayworking business for experiments in regard to proper form of tile. Modes of working and burning could be made at little expense, but the business could not be made profitable until you were able to carry it on a liberal scale. All of our best manufacturers make roofing tile their exclusive business. While in European countries it is quite common to make brick and roofing tile in the same factory, we believe that the best results are obtained in roofing tile by making roofing tile alone. This includes whatever is necessary to make a complete tile roof for any building; hip rows, crestings, tower tile for any tower, etc. To do this requires a factory of liberal proportions, sufficient capital, skillful workmen and a good manager. Yours truly, GEO. S. TIFFANY.

Kiln Crowns.

Editor Clay-Worker:

I have noticed in your valuable columns of late something concerning the proper construction of kiln crowns, and I trust you will pardon a few words from me.

Kiln crowns may fall because the side walls of the kiln give way, but I am certain that but few crowns, comparatively speaking, are lost in this way. Most crowns that fall, fall because of bad materials, workmanship and improper pitch. Good crowns can be built with good, smooth, standard-sized fire brick—in fact, are being built continually—but better crowns can be built with fire clay blocks, say 4x9x12 at the large end, and cut wedge shaped to lay straight with the radius of the circle forming the arc on which the crown is built. Even a larger block than the above can be used with excellent results. Blocks cannot always be had at a price which the buiders can afford to pay, or, I should say, which he thinks he can afford to pay.

Inasmuch as fire clay blocks are difficult to obtain, the next best thing is good, No. 1 fire brick. These should always be even in size. They should be set endwise, so that a center line drawn through the brick from end to end will be parallel with the radius of the circle from which the arc is taken.

The inner end of the brick should be set close together. The outer end should not touch the brick on either side. The space between should be filled with fire clay mortar. The edges of the brick should touch without mortar. The courses, one after another, should be set so as to break joints.

In square kilns the crown should not come nearer than four inches of the end of the wall. After the crown is finished, mix fire clay mortar as thin as possible, and pour over the crown until all the joints are filled. Do not use any cement.

In starting the crown, see that the side walls are perfectly level and well braced.

In building round kilns the bands must be put on before beginning the crowns. No arch boards are used in round kilns. The crown rests full weight on the sides of the kiln from the beginning. Centers and arch braces must be used in building crowns on square kilns. See that the centers are strong, true from end to end and well braced. If you have been careful in this you need not put up the braces to the kiln until after the arch brick are set. When the arch is finished, put up the braces and brace rods at the sides of the kiln. Then tighten the rods until you lift the crown from the arch boards in the center. Then remove the centers and the arch will stand perfectly.

It is best to build the arch of a round kiln from the inside, while the arch on a square kiln must be built from the outside.

After the crown is finished and braced and up, carry the walls up the proper height, but be sure to cover the crown with brick solid as high as the side walls.

It is a good plan to lay a flat course of brick over the entire crown, after which fill the spaces between the flat course with thin mortar.

In square kilns, close the four-inch space between the ends of the crown and the ends of the kiln wall with brick layed on top of the crown, with the ends toward the wall.

No absolute rule can be given for the pitch or rise of a crown.

The size of the kiln, whether round or square, and the kind of brick to be used, must be taken into account in building any crown. Some brick expand much more with heat than others. Again, some manufacturers build their crown on small kilns with common brick, while others use fire brick over the bags and common brick in the center. While I do not advise the use of anything but good fire clay materials, I find I must often calculate the pitch of a crown to suit inferior brick.

When the brick composing the crown expand much when heated they will shrink as much or more in cooling. Here is where the difficulty lies in holding the crown. As the kiln cools, the crown settles to a point a small fraction below where it stood before fireing.

If every point of the crown would expand and settle equally no serious results would arise, but an equal expansion and contraction cannot be expected, especially in crowns made from common or inferior brick. And for another reason—it is impossible to build a crown so that every square foot of its surface will have an equal weight with every other square foot. So sure as the crown is heavier in any part than another, just so sure will the heavy part sink lower in cooling. As the heavy part settles below its natural position the lighter part rises above its natural position, and thus you soon have an uneven crown.

If the brick comprising the crown shrink in burning, the crown will soon settle below the starting point. The shrinkage of the brick must always be taken into account in determining the height at which to build the crown. This will not argue much where good, No. 1 fire brick are used.

In my next I will give you some rules for determining the proper arc for kiln crowns. W. A. EUDALY.

New Haven and Vicinity.

Editor of the Clay-Worker:

The brick business is in a rather unsatisfactory condition just at present. In all the yards, with the single exception hereinafter mentioned, there are large stocks of brick on hand, for which there is not a very active demand, and this, too, at the very beginning of the season, with every yard expecting to make its full quota as usual. The organization is a thing of the past, and, although the owners in this immediate vicinity, keep up a semblance of one, it is only in name, and of little effect. Should a coroner's jury be summoned their verdict would have to be something like this: "The deceased came to a violent death at the hands of a person or persons unknown, who were of great greed and monumental selfishness, and who killed that which, during its life, did much good and no harm to any one." Of course, prices are very low—about $4 per M at the shed, as against $6 per M when the organization began to disintegrate.

There is now a very distinct rumor of a brick trust, intended to own and operate under one management all the yards in central Massachusetts and Connecticut. It is being promoted by the New York city law firm of Waller & Wagner. This firm, consisting of Ex-Governor Thomas H. Waller, of Connecticut, and S. Harrison Wagner, Esq., whose home is in New Haven, has been very successful in organizing large interests. The brick side of the case is being handled by Frank L. Stiles, and it goes without saying that it will be well handled. I am told that very favorable options on several yards have been already secured, but I am of the opinion that in this locality the owners have not yet given the trust much consideration. As you are aware, right in this vicinity the brickmakers have been pretty successful financially, and they are not obliged to hustle very much to get in out of the rain, their situation being such that it does not rain very much, no matter where they stand.

Our mutual friend, Capt. Samuel P. Crafts, had the misfortune, about five weeks ago, to fall down a stairway and against a door at the bottom of it and break his arm. He is now about the city as usual, with his injured arm in a sling. The captain has just finished a term as one of the selectmen of the town of New Haven. Politics, however, had nothing to do with his fall. In fact, I am assured that he was on his way to a church service when the accident occurred. Captain Crafts' yard is now run, under a lease, by Fred H. Brockett, who is also actively interested in the Park Brick Company of Hartford.

William E. Davis & Company are operating their two yards as usual. For downright hard workers I believe that these two brothers—"Bill" and "Jim"—are entitled to the palm, and their annual product of 8,000,000 is second to none.

H. P. Shares, the pioneer of the East in the pallet system of drying brick, has just returned from his winter home at Rockledge, Fla., very much improved in health. He seems to have found there the "fountain of youth." His home at Rockledge is situated in a veritable Garden of Eden, and the surroundings are well calculated to recuperate the energy he has expended during forty-five years of close attention to the details of brickmaking.

The I. L. Stiles & Son Brick Co., of which Frank L. Stiles is the treasurer and very efficient manager, is starting in the season with empty sheds and a large list of sales already booked—no uncertain indication of the ability of the aforesaid manager. A descendant of a family of brickmakers—and good ones at that—Mr. Stiles has allowed very little to escape his attention, and any information that he is not possessed of is unworthy of comment.

E. S. Morse continues to manage the C. P. Merwin Brick Co. at Berlin. He is ably assisted by R. Clifford Merwin, a recent graduate of Yale, who is indeed a worthy son of a worthy sire.

A new Chambers machine for making hollow brick and tile has been put in the yard of W. L. Davis in Berlin, which makes quite an addition to his already extensive plant. With a yard second to none, and an efficient superintendent in the person of Fred I. Shares, Mr. Davis has a combination this year that will be hard to beat.

But why particularize further? Connecticut is full of good brickyards and the best of brains to run them. We still have faith in the future, and in the meantime we are prepared to take temporary discomforts like true stoics.

Yours for brick, QUINNIPIAC.

North Haven, June 5, 1899.

Was it Lamination?

Editor CLAY-WORKER:

I am in trouble, and naturally turn to THE CLAY-WORKER for assistance. I have been making some paving tiles. Laid some sidewalks with them last fall, and they split badly during the winter, the effect of the frost, I guess. The tile that I thought were really overburned were the least affected. How can I prevent this cracking? Would it do any good to repress the brick or tile? Would the repressed tiles split as badly as ordinary stiff mud brick not repressed? Can good paving brick be made from strong clay which melts very easily—that is, under at a low heat? What is the best way to set and burn brick made of such clay? If some of your readers who have had experience in such matters will help me out I will appreciate it very much. ADAMS.

Was it Lamination?—A Reply.

Editor Clay-Worker:

In attempting to reply to the questions of "Adams" (I cannot be respectful and say Mr., for it might be Mrs. or Miss), it will be necessary to guess at some things and suppose others. I guess the paving tiles were made on a stiff mud auger machine, and, as the heading of the queries suggests, the tiles may have laminations continuing from the uniting of the clay after it leaves the auger blades. The statement that the hard burned tile were the least affected suggests that when the clay is heated enough to burn it well certain ingredients are fused and unite across the laminations and bind the contiguous laminae or plates together.

To the question, "How can I prevent this cracking?" two answers may be offered. One is to burn the tile very hard. The other is to change the machine to prevent lamination—that is, on the supposition that the cracking is due to lamination. If the tile all split or crack alike, the difficulty is evidently due to the shapes and relative positions of the augers and die.

I have seen side cut stiff mud brick that had a line showing across the center of each brick where the two columns of clay from the two blades of the auger came together, but failed to thoroughly unite before leaving the die. These brick were weak and easily broken along this line. Possibly the splitting of the paving tile is due to the same cause.

As laminations occur more readily in strong, smooth clays, they may be partially prevented by mixing more sand into the clay. Repressing might help to remove the difficulty, but if there is a seam or lamination in the tile before repressing there would probably still be one there after.

To the question, "Would the repressed tiles split as badly as ordinary stiff mud brick not repressed?" I will say, "That depends." If the tile and brick are made on the same machine and with the same feed augers, and the brick had laminations and would split, the tile probably would also. The best stiff mud auger machines will make brick free from laminations, and hence that will not split, if the clay is in the proper condition.

"Can good paving brick be made from strong clay which melts very easily—that is, at a low heat?" No, not profitably. Good paving brick must be burned very hard. A kiln of brick made of clay that melts easily could not be burned uniformly throughout and hard enough to make good paving brick of enough of them to be profitable. Those nearest the fires would likely be overheated and melted and thus spoiled before enough heat could be driven past them to burn those farther from the fires hard enough. Some good paving brick might be had from each kiln burned, but not enough to make the manufacture of paving brick profitable from that class of clays.

Large percentages of very hard burned brick can only be had from clays that do not melt easily, but that will retain their shape under the high temperatures required to burn them very hard.

The best way to set and burn clays that melt easily is to carefully set the courses of brick end to end, forming channels or flues from the fires. The draft passes readily from the furnaces, and carries the heat away from the brick near the fires and distributes it through the kiln, thus reducing the liability of overheating the brick nearest the fires. Clays that melt easily should be burned in down-draft kilns, where the hottest brick are on top and not liable to be crushed out of shape by the weight of the others when near the melting point, as they would be in up-draft kilns. D. W. STOOKEY.

Cedar Rapids, Ia.

Wants Self-Oiling Cars.

Publishers Clay-Worker:

Inclosed please find check to pay for The Clay-Worker for 1899. Although I am doing a very small business, compared with others I read about in The Clay-Worker, yet I consider I am well repaid for the cost of the journal.

I was well pleased with the past year's work, the sales being 50 per cent. more than last year and at better prices, and this season starts out still better. I have all reasons to believe this year will be an exceptionally busy one.

I would like to hear from some iron workers who have self-oiling wheels and axles for coal-mine cars.

Leeper, Pa. H. HEFNER.

Artificial Dryers.

Editor Clay-Worker:

The article on "Artificial Dryers" by Master Mechanic, in your last issue, is concise and comprehensive, and full of good, sound sense, but it does not entirely fill the bill. There is one other very important point that must be included before you can have a successful dryer, and that is circulation. It is not enough to have a hole in one end of the tunnel to let the vapors out. It must not be forgotten that this vapor is heavily charged with moisture. It looks like steam, but it does not fill M. M.'s conditions by concealing 212 degrees of available (may be latent) heat, nor has it the elasticity necessary to a quick escape, consequently it must be assisted, either by a stack or stacks of suitable height or by an exhaust fan.

The point I want to impress is that, if you want to dry thoroughly, you must have sufficient circulation. The axiom, "Heat alone will not dry bricks," has been so often used in your valuable journal that I am almost ashamed to repeat it, but, for all its prominence, it is a point very often slighted. For some reasons the fan draft is to be preferred, but for others (and, I think, the majority) chimney draft is best.

Build a stack and you have it; put in a fan and sometimes you have it not. The steam used to run the fan will go a long way towards heating your dryer, if applied direct. Fans can be run (sometimes) to any degree of draft you want, regardless of the weather, and this is their chief recommendation. But, to come to the point, I would advise, on building a dryer (tunnel, of course), if you build stacks build them high enough, or, if you put in a fan, put in one large enough, the object being to make a circulation strong enough and steady enough to carry off the vapors of the drying bricks, so as to dry them evenly and uniformly, and so that you can depend on a stated daily quantity of thoroughly dry bricks. I have written this as a sort of codicil to the very able article of "Master Mechanic." BONE DRY.

A Good Plant But Troubled With the Old Complaint—Brick Crack While Drying.

Editor Clay-Worker:

Inclosed please find $2 to cover my subscription to the Clay-Worker for the next year. It is always a pleasure to receive your paper, and it ofttimes gives me much valuable information.

Replying to your inquiry, will say that I am interested in a brick plant in the City of Mexico. We have (so every one says who has seen it) one of the finest plants in this country, but we have not as yet been able to overcome one serious drawback, i. e., our bricks crack in the process of drying. As you, no doubt, have had many similar letters from others on this same subject, could you not suggest some remedy, and much oblige? A MEXICAN SUBSCRIBER.

The Situation in Chicago.

Editor Clay-Worker:

The outlook in the building line as we enter the summer months is better than has been the case in this city for several years. During the spring months the principal operations were in the cheaper class of apartment houses, of which a great number have been erected, the larger portion of them being located in the south division of the city. South of Fifty-fifth street and east of State street seems to be the location of most of them, and if there does not, in the near future, come a change, this entire territory will be largely covered with this class of structures.

Owing to the low prices asked for stone a large proportion of them have been faced with that material. Probably 40 per cent. have been faced with press brick above the first story, the first story being usually of stone.

Since the World's Fair year the building of this cheap class of apartments has continued from year to year, and now, to the observer, it seems that there must soon come a halt. These structures are of what might be called a speculative character. The new ones are usually rented as fast as completed, and sold on the basis of income as shown in the first year's earnings. These earnings usually decrease after the first year, and the investor must stand the loss.

Turning away from what I have stated above, it is with satisfaction that I am able to state that there are some apartments now about being started that will be a credit to the city. Messrs. J. B. Waller and D. B. Lewis are about to start the construction of the finest apartment house ever built in this city. It will be located at the corner of State and Schiller streets, a couple of squares south of Lincoln Park. The building will be eight stories high, and will cover a lot fronting eighty-five feet on State street and eighty-three on Schiller. If the present intentions are not changed the exterior will be constructed of press brick and terra cotta, the basement story being of stone. It will be of steel fireproofed construction. There will be two apartments on each floor, one of seven and one of nine rooms. The rooms are large, and will be fitted with every modern convenience. Mr. James G. Rogers is the architect. As planned this will be a much finer and in every way better building than anything ever undertaken in Chicago before. The location is very desirable, and it will undoubtedly draw a profitable class of tenants.

It has been ten or a dozen years since Chicago has had as many fine homes under construction as it now has. Thirteen of these homes will cost $667,000, or a little over $51,000 each on the average.

A well-known real estate operator said, a few days ago: "The purchase of residences and of vacant property for the purpose of erecting homes has a deeper significance than most people usually think. In the first place, people do not invest their capital in a home ordinarily unless they can afford to do so, because many people of means consider it a far more sensible proposition to rent a house rather than to own it. They look upon it as a luxury they cannot afford. But when they purchase property of this class it shows that their means are greatly increasing, and that, having attained the point at which they think they can afford an investment of this sort, they immediately take advantage of it. The present activity is undoubtedly the beginning of a movement which will penetrate all classes, resulting in a gradual but sure revival in the real estate market, the subdivision and cheap lot trade being probably the last to feel it."

The prices of building materials have gone up in sympathy with prices of labor, and the desire for a return to an increase of profits on the part of manufacturers and dealers. Press brick, fireproofing and terra cotta have all increased in cost of manufacture, and, while adding the actual increased cost, something has been added in the way of profits. As a result the clayworkers have a more genial smile upon their faces when one chances to meet them.

The Stonecutters' Union has forced the stone dealers to abandon the use of machinery in preparing stone for the building trade. This, it can easily be seen, will cause the prices to go up, and this should, and may, help the clayworker to get a greater proportion of his product into future construction than has been his privilege in the past few years.

TEMPERED CLAY.

Jersey Brickmakers Very Busy.

Editor Clay-Worker:

There is nothing new in the brick line over in this section only that all plants are just now running to their full capacity, both building and fire brick plants. The demand is greater than the output, which I hope will continue so for the season at least. All red brickyards are in full swing. One firm, fire brick manufacturers, are running one-half of their plant, or nearly so, on semi-glazed brick, building brick size, for the sky scrapers of New York city. This class of brick is just now very much in demand in New York city, and so a fair price can be obtained for them. There is, no doubt, money in the business. The brick are not dipped but sprayed, which is much cheaper than dipping, one man spraying some ten thousand a day, with three helpers placing brick on cars, etc.

The building business in Trenton is booming, with prospects of continuing to the close of the year. Things are looking bright in this section for a first-class busy season, both in the building and fire brick business.

I. W. D.

Trenton, N. J., May 19, 1899.

The Situation in Cleveland.

Editor Clay-Worker:

Nothing but common brick are made in the yards in the city and its vicinity. Every yard is running to its full capacity, but the demand outruns the supply. We sat in the office of prominent brick dealers this afternoon, and for nearly an hour the visitors were to a man grumbling contractors or contractors' representatives, and the telephone wires between office and yard were kept busy with demands to ship to A. or B. to-morrow sure, as against the demands from any other quarter. Prices are $6 per M for kiln run.

Messrs. Barkwell & Bradley, large manufacturers, have contracts now—for the second year—for the output of most of the city yards, and will probably handle 80,000,000 to 90,000,000 brick the present season. F. H. Eggers, the whilom president of the N. B. M. A., is the only large producer who is marketing his own product. It is estimated that not over 10,000,000 brick will be handled outside of the Barkwell & Bradley office, of which 6,000,000 to 7,000,000 will be produced by Mr. Eggers. It is also estimated that about 40,000,000 more common brick will be laid here this year than was laid last, and no doubt no small amount of building will be deferred because brick cannot be had at any price.

Of course there is plenty of grumbling on the part of contractors and builders, and a prominent city paper has recently voiced their grievances in a lengthy and inspired editorial, from which we make extracts:

" 'The brick combine people are to have a taste of their own medicine,' said one of Cleveland's most prominent contractors yesterday. 'Within a week plans will be matured for an $80,000 independent brickyard, which will be located in South Brooklyn, for the purpose of bucking the combine which now has such a tight hold on all the brick in Cleveland and vicinity.' * * * Fully a dozen of the contractors have signified their intention of participating in the movement. They hope to get their yard in running operation in two months. * * * Through the medium of the new concern first-class brick at a low price will be turned out in quantities large enough to completely control the Cleveland market," etc.

Your readers who are practical brickmakers will certainly want to visit Cleveland in the next three months to learn how an $80,000 plant can be made to control a market that will use nearly 100,000,000 brick in its building operations this year. Such visitors should not come until the 62d or 63d day, in order that the managers may have two or three days' experience in running the plant, and so be free to give their attention to their inquiring craftsmen.

It is admitted in the same newspaper article that there is an unprecedented amount of building in Cleveland this year, the structures now in process of erection equaling the combined building operations of the last three years. There are said to be sixty-five apartment houses now in process of erection, and many private residences and blocks. A contractor stated that [illegible] a number of residences that were roofed and in all ways nearly complete with the exception of chimneys, and neither contractors or owners could obtain the brick for them for love or money. Many proposed building projects are being deferred on this account.

When it is remembered that this demand and brick famine has not led the parties controlling the brick supply to advance the price beyond $6 per M, it will be evident to thinking men that no unfair advantage is being taken. It is admitted that "the total output is far too small to meet the demand," and yet, coupled with the admission, is the charge that "the building material men are trying to run things with a high hand," etc.

Some large office buildings now well advanced are worthy of mention. One ten-story structure, having a frontage of about 200 feet on Prospect street and 250 feet on Erie, has received its facing of white glazed terra cotta—at least the eight upper stories have—while an ornate cast-iron face is now being applied to the two lower stories. Within a stone's throw is a second building, having a frontage of 100 feet or more and a height of nine stories, the steel frame of which has reached its full height, the lower stories of which are to be treated as the last building mentioned, while about the same distance in another direction is the Caxton building, eight stories in height, 100 feet or more of frontage, which is receiving its dress of "speckled beauties" in the form of Roman brick with terra cotta trimmings. At the northwest corner of the public square, and with a front on Euclid avenue, the foundation of a sixteen-story building is nearly completed. It adjoins the Cuyahoga block—one of Cleveland's finest office structures—and will be about twice its height. It will have a frontage of about eighty feet on the public square and 100 feet on Euclid avenue.

One can but notice that Cleveland leads most other cities of this country in the matter of the frontage and depth of many of its business structures. The Arcade building and the Colonial Arcade block are each noteworthy on this score.

We have already referred to new structures on Prospect street having ornate iron fronts for the two lower stories, and it seems to us this feature of construction is more in evidence in this city than elsewhere. The Garfield block and the New England building which adjoins it are as fine illustrations of such work—the two lower stories—as we have ever seen. Cleveland is the home of iron work in all its branches, and no doubt the special skill of its workmen in this line has had much to do with the prominence which it has achieved. The Garfield building is made especially attractive by the use of designs modeled on terra cotta lines and so carefully disguised that only careful examination will undeceive. No doubt the item of saving in cost resulting is large, and what is admissible in the treatment of lower stories would be ruled out on insurance grounds if applied to upper stories.

Readers of a clay journal will be interested in knowing how prominent a part shale brick are taking in sewer construction in this city. An intake for a new water supply, extending an unknown distance into the lake, will have absorbed, when complete, 16,000,000, while a main line of sewer laid in Walworth run, 4¾ miles long, 8 feet diameter at its upper end and 16½ at its lower, will require 40,000,000 vitrified shale brick for its completion. It is but a few years since F. B. Many, a well-known manufacturer of shale brick, residing in this city, secured the introduction of eleven courses of these bricks in the bottom of a sewer then being built, and this, no doubt, is the fruitage of that effort.

OCCIDENTAL.

Experienced Clayworkers Wanted in California.

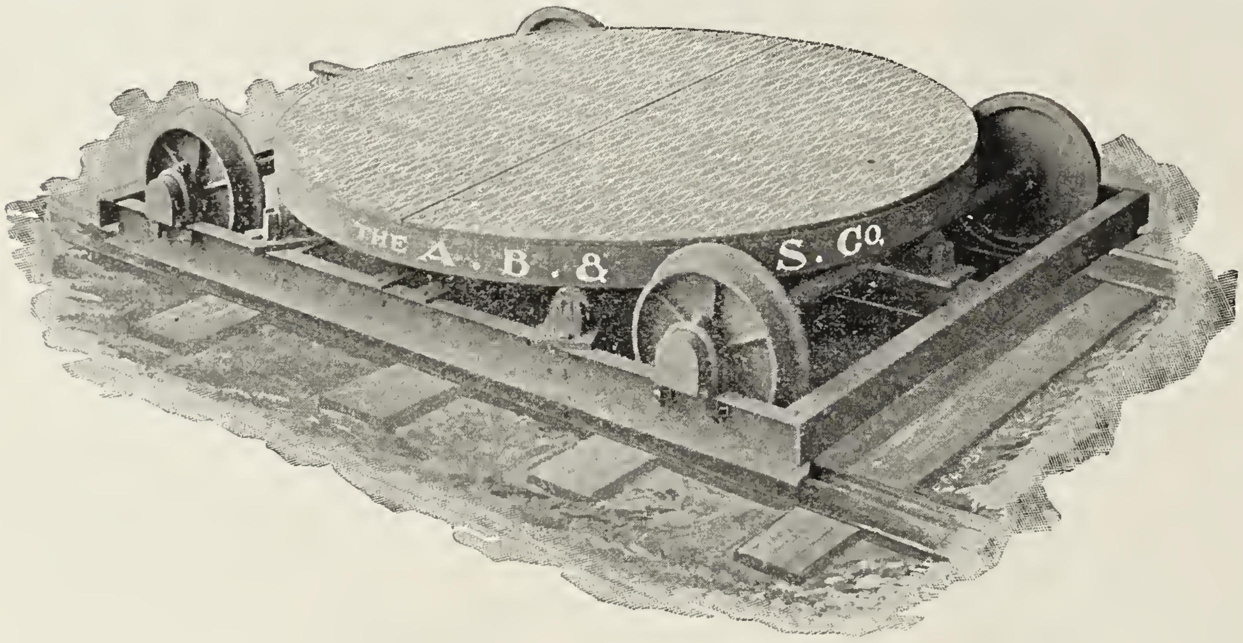
Publishers Clay-Worker:

We are starting two new plants here in California and hope to have as good plants as there are in the country anywhere. At one plant, we will make brick, both common and pressed and at the other, hollow ware, terra cotta and sewer pipe. We want some experienced men at both works. Will be pleased to correspond with parties wanting permanent situations as burners and setters. Party understanding how to make salt glazed ware can obtain desirable situation, also those familiar with making shale ware and setting in continuous kilns. Both plants will be in operation early in July, when you will hear from us further.

R. SOUTH, 4128 Seventeenth St., San Francisco.

ST. LOUIS NOTES.

THE CHELTENHAM PLANTS, in the western part of the city, have just had a strike that at one time threatened to become serious and ugly, but, thanks to the grit and coolness of one man, the worst of it is over. The strike started at the Winkle Terra Cotta Works, where the Italian laborers demanded an advance from $1.25 to $1.35 for a day of ten hours. This was granted them, when they then demanded a second advance to $1.50 a day. This was refused, when they quit work and walked out as a body. A few American laborers attempted to return to work, but the Italians made ugly threats and frightened them away. They also forced the skilled laborers to quit, through intimidation, and would allow no new men to take their places, as plenty of laborers would have been only too glad to secure steady work at $1.35 a day. From Winkle's yard the strike spread to Evans & Howard's fire brick plant, to the Laclede Fire Brick Works, the Mitchell Clay Co. and to the Hydraulic Brick Co. The clay miners also came out of the pits by demanding a raise from $1.80 to $2 a day. By thoroughly protecting the works with police the burners were undisturbed, and no attempt was made to injure the plants, though a few assaults were made on the teamsters. The strike lacked organization and an efficient leader, and it was finally broken in a most unique manner. After about a week of idleness, when Mr. Stedman, the new superintendent of the large Evans & Howard plant, arrived at the factory at the starting hour, a crowd of over 200 noisy, threatening Italians met him, and were unpleasantly demonstrative in their demands. He quietly and coolly walked through them until at the factory gate, when he pushed two or three of the strikers into the yard and ordered them to go to work. The men halted, hesitated a moment, looked back at the crowd, but, on being again ordered to work in a sharp voice by Mr. Stedman, they meekly went on, took up their tools and started to work. This cool, courageous action on the part of Mr. Stedman broke the strike, for the balance of the strikers began to fear that they would lose their places if they held out any longer, and back to work they all skurried. Most of them are now in their old berths, but it will probably result in the Italians being slowly eliminated, as they not only caused all the trouble, but interfered with the Americans who did not want to strike. The clay diggers are still out, but, as most of the yards have a good stock of clay on hand, it has not yet interfered with the running of the yards, and it will probably result in the diggers being put back on the former system of ton mining, which gives the good miners the benefit of their skill, while the gasbags will find that wind will not mine clay, if it does influence a weak foreman. The plants affected by the strike are mainly dependent on fire clay, which is mined by the room and entry system from a six to nine foot thick seam, so that if the men hold out much longer it is likely that coal miners will take their places, for this is the season when the average coal miner is lucky if he can earn $30 a month, whereas the Cheltenham diggers make from $45 to $48, and get steady work.



A New All Steel Transfer Turntable for Brickmakers.

The season continues too wet for the building brick people to harvest much clay, so their clay sheds are about empty, and we will have a brick famine if we do not have a good spell of dry weather. This will be especially unfortunate, as building is going ahead in a healthy, encouraging manner, and prices have at least reached a living, remunerative figure.

The Mitchell Clay Company, who manufacture fire clay goods exclusively, are about to erect another kiln, and the young but vigorous St. Louis Terra Cotta Company are contemplating adding another muffle kiln to their plant.

The paving brick plant at Glen Carbon, Ill., has been equipped with a new dryer, and is reported to be crowded with work. Their output is largely used for paving St. Louis alleys and for lining the sewers.

Sandeson's yard at Moberly is very much behind in filling its orders, and has booked enough ahead to take the season's output. They make pavers, sewer brick and builders, and are going to build another Eudaly kiln. "LOUIS."

A GREAT FUEL SAVER.

The Chicago Brick Machinery Co., 225 Dearborn street, Chicago, Ill., in addition to a full line of soft clay, stiff clay and dry press brick machinery (see ad. on front inside cover), offer manufacturers a patented rocking grate bar, which is not only a great convenience, but is a real money maker, for it prevents the waste of fuel that occurs with the use of ordinary grate bars. They have recently equipped the boiler furnaces at Gates's Terra Cotta Works and also those of the Ludowici Roofing Tile Co., both of whom are very much pleased, stating that the U. S. rocking grates will soon pay for themselves in the saving of fuel, and, besides are a great convenience, being absolutely self-cleaning and easily operated. Those of our readers who are interested are requested to write the Chicago Brick Machinery Co. for illustrated circulars, etc.

A NEW TRANSFER TURNTABLE

We have the pleasure of illustrating a transfer turntable manufactured by the Atlas Bolt and Screw Company, of Cleveland, O., that will be gladly looked on by the brick manufacturers in general. It is made entirely of steel, turntable being made of checkered steel, resting on rollers, secured to a steel frame, which is well braced throughout. The transfer car is equipped with roller bearing wheels, neat in appearance, and very durable. It sets low to the track, making a first-class article in every respect.

NOTES FROM TIDE WATER, VA.

A NEW BRICK and tile manufacturing company has just been organized in Norfolk. It is composed entirely of enterprising business men of Brambleton Ward. The capital stock of the new enterprise is to be not less than $25,000. The company has purchased ten acres of land on what is known as the Riverside track, on the line of the Virginia Beach Railroad, just beyond the eastern limits of the city and convenient to transportation, which will enable the company to ship all brick and tile manufactured by it in the most expeditious manner. The clay from which the brick and tile are to be made is brought from Munden Point, on the Virginia Beach road extension, and is said to be of very fine quality. The officers of the company have not yet been chosen, but a superintendent and general manager has been secured in the person of Mr. C. B. Oldfield, who has had years of experience in the manufacture of brick around Norfolk. He has already put in the most approved kilns and machinery, and has on hand a quantity of material with which to begin work.

The Union Brick and Tile Works, T. M. Lilleston proprietor, are putting in a new tunnel dryer at their plant near Suffolk.

E. W. Fase & Son have added a new Raymond steam power repress to their Norfolk yard, and are now turning out a very fine front brick.

Mr. A. C. Larson, who went to Santiago, Cuba, a few months

ago, to start a brick plant, did not stay there very long. He is now at his old home in Denmark. A letter received from him some time ago said he would return to Suffolk, Va., after visiting his old home.
H. L. J.

BURNING PAVING AND FRONT BRICK.

I expected to engage in the manufacture of paving brick, and with this in view investigated the merits and demerits of two of the best styles of down-draft kilns in the market and now used by the largest paving brick plant in the country. From these kilns and the experience of the large company using them, and also from my own experience (dating back many years) in burning brick, I devised a system of down-draft kilns for my own use, especially designed for burning paving and front brick. This system has several superior points over any other kilns now in use. I will only refer to three of them at present.

1st. Drying off and heating up by up-draft, whereby the bottom brick are dried off first and so made strong to bear the weight of the bricks above them. Also, and very important, when we commence to burn by "down-draft" proper we have a hot bottom to draw down the heat from the top, instead of a cold bottom, as in the old method, which prevents draft and holds the heat on the top brick with damaging results. Too much heat on top and too little at the bottom. All experience and knowledge of the laws of heat and drafts will approve our method.

The second point is using the heat twice, by making the second kiln that is being watersmoked and heated up the chimney for a part at finish and later for all of the waste heat from the kiln being burned by down draft.

The third point is, that by reason of the peculiar form of our center flue several good results are obtained, namely equalizing the heat and drafts in the burning kiln where the draft at the point farthest from the chimney is equal to that nearest the chimney. This is not possible under the old system of center flues. Another important advantage of our center flues is the more equal distribution of heat under all of the kiln being watersmoked. This center flue alone, where no attempt is made to utilize the waste heat by using it twice, will be found of great advantage for the reason stated above. So well satisfied are we of this that we will enter into a contract to oversee the construction of one of these center flues in a new or old kiln, and if it is not a decided benefit we will forfeit $100 to the party who owns the plant and puts in the flue. These center flues can be used in double length kilns, say of 100 feet long or more. Parties starting new plants will find it to their advantage to investigate my system of kilns.

Minneapolis, Minn. J. K. CALDWELL.

MEETING OF THE CERAMIC SOCIETY BEGINS AT CLEVELAND, TUESDAY, JULY 4.

The first summer meeting of the American Ceramic Society begins at Cleveland, O., July 4. The formal programme provides for a session at 8 p. m. in the parlors of the Hollenden Hotel. At 8 a. m., Wednesday, the 5th, the members will take the regular lake steamer for Put-in-Bay, arriving at the islands about noon. After dinner at Hotel Victory a tour will be made of the islands, or the party will return to Cleveland, the boat leaving the island at 3:15 p. m., whichever seems most agreeable to a majority of the members. In case of a rough lake or rainy, unpleasant weather, the lake trip can be put off one day or abandoned in favor of a trip through the manufacturing plants and shipyards at Cleveland. It is intended to spend Thursday in and about Akron, which is thirty miles from Cleveland, and can be reached by electric cars. Hotel Buchtel will be headquarters there, and the members will make a tour of the extensive clay manufactories in that vicinity. Friday morning the party will proceed to Barberton and inspect the great plant of the National Sewer Pipe Company. If time permits a trip will also be made to Cuyahoga Falls, where there are some large plants and much beautiful scenery. The party will break up Friday evening, but for any that desire to spend a longer time in Akron or any of the neighboring centers of ceramic industry, the opportunity will be available. Prof. Edward Orton, Jr., of Columbus, O., the Secretary of the Association, requests those who expect to attend to notify him as early as possible, so that he can arrange for the accommodation and comfort of all. As excursion rates prevail at that time a large attendance is anticipated. A good time is certain for all who participate.

A GOVERNMENT BRICKYARD.

—A New Dry Press Brick Plant at Ft. Leavenworth.—

IT MAY BE NEWS to a good many of the readers of The Clay-Worker, but perhaps it will surprise but few, for in these days of expansion anything is likely to happen, but the national government has established a dry press brick plant at Ft. Leavenworth, Kan. However, it is not the intention of Uncle Sam to compete in the open market with the brickmakers of that section, but instead the product of the plant will be used exclusively for government work. A new prison building is to be erected, and the new plant will be kept busy turning out brick for that purpose for some months to come.

Warden French, at whose suggestion the brick plant was installed, thinks they have one of the best equipments in the country. A year ago, when it was determined to put up a new building, Warden French began investigating the feasibility of making fine front brick from the clay at the fort. Samples of the clay were sent to St. Louis, Chicago and Bucyrus, O., to be tested. The results were so satisfactory that the warden reported to the authorities at Washington, recommending the installation of the plant. His recommendations were approved, and the leading dry press manufacturers of the country requested to submit bids. They did so, and the prices ranged from $2,600 to $6,600. The warden was instructed to investigate the merits of the various machines. He did so, and selected the Ross-Keller machine of St. Louis, notwithstanding the fact that it was the highest-priced machine.

In due time the machine was installed, and the manufacture of brick begun. The first kiln was recently opened, and Warden French reports that the brick are "fine as silk." They burn in up-draft kilns containing 250,000 brick, watersmoke with wood, and finish with coal, the entire process of burning requiring fourteen days or more. The brick are not only smooth and regular in shape, but have a fine color and have an excellent ring. Warden French says that the new prison building, constructed of these brick, will be one of the finest government buildings in the West. He is much pleased with the Ross-Keller machine, which is a six-mold press. The brick come from the machine with polished surfaces, and are so firm and compact that they can be handled without the least loss from breaking, etc. Warden French says the machine does its work perfectly, and that it is so strong that it will last for many years. It is now run at a speed that enables them to make 3,000 per hour, but the capacity can be increased to 3,500 per hour if found necessary. There is an inexhaustible supply of clay, the government having about thirty-five acres which average some thirty feet in depth. The warden thinks there are also some excellent deposits of shale in the same vicinity, and may manufacture vitrified brick for paving purposes from same in the near future.

OBITUARY.

—John Milton Newton.—

ON THE 9TH OF MAY, 1899, Mr. John Milton Newton, president and treasurer of Newton & Co., the fire brick and stove lining manufacturing corporation of Albany, N. Y., passed away. Mr. Newton was born in Albany, Nov. 19, 1838. He came of English stock, on his father's side, his paternal ancestor having settled in Connecticut in 1645. His mother was Eliza McIntosh, a descendant of the McIntosh family of Scotland. Mr. Newton was educated in Newtonville, near Albany, at the school conducted by the Rev. Mr. Arthur, father of the late President Arthur. He also attended an academy at Monticello, N. Y. He entered the fire brick and stove lining business forty years ago, and made the fire clay industry a life study, especially the manufacture of fire brick for stove lining. Mr. Newton was a man of warm impulses, a man who could be relied on under all circumstances. It was my privilege to know him intimately, and his loss will be felt by all who were brought in contact with him. A loving and kind husband, an affectionate and indulgent father, his memory will be revered, and his loss will be felt by the wife, son and daughter that are left behind.

C. A. BLOOMFIELD.

Johnston Beggs, 202 North Eighth street, St. Louis, Mo., writes that a new brick plant will be established there, and he will, therefore, be glad to receive catalogues of brickmaking machinery.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXXI. JUNE, 1899. No. 6.

CURRENT COMMENT.

The South is keeping up with the prosperity procession. John W. Sibley, the popular treasurer of the N. B. M. A., writes that Birmingham, Ala., is having a building boom. The demand for building brick is such that he contemplates erecting a new building brick plant at Coaldale. If he does it will be a model plant, for "Master John," as his dusky employes call him, understands every detail of the business thoroughly.

* * *

The social event of the month was the wedding of the worthy president of the N. B. M. A., Mr. Willard Durant Richardson, of Shawnee, O., to Miss Bertha Winifred McCahon, which occurred the 14th inst. at the home of the bride's mother at Newark, O. It is needless to say that all the members of the N. B. M. A. and Mr. Richardson's countless friends throughout the country wish him and his bride the best of good luck. The Clay-Worker sincerely hopes that they may journey happily together to a ripe old age.

* * *

Our first page illustration is peculiar in that it portrays the face of our good scribe, Gates, in connection with a creation of his own fancy and deft fingers. The terra cotta Indian and pedestal is of itself a fine bit of sculpture, an example of what the expert clayworker can do in color work, the body being dark red and the trimmings white, buff and black. The feathers and headgear of the big chief are finely modeled, appearing quite natural. The face is produced by a bit of photographic legerdemain, and is the face of Gates, taken without his knowledge, much as the wizard in his story caught the shadow of the little Indian maiden.

* * *

In the death of R. B. Morrison, known best to our readers as "R. Brick," which is recorded on a preceding page, the entire clayworking fraternity suffer the loss of a wise counselor. A gifted writer, a true friend and a conscientious man, his place may be filled as it is ever the lot of men, but the memory of his virtues and the good he has done will live forever. Of Mr. Morrison it may be said in truth he was an honest man. Among all our acquaintances we never knew a more unselfish nature. In all his contributions to this magazine, and he was a constant contributor for many years, he never at any time tried to advertise himself or advance his personal interests in the least, but gave freely of his knowledge and hard-earned experience as a practical brickmaker for the benefit of his fellow-workers. His was indeed a rare personality.

HIGHER PRICES FOR BUILDING MATERIAL.

Of course, every one who has to buy realizes the recent great advances in the prices of material. It cannot be said, however, that this advance has been realized in the manufacture of clay products, unless we accept that which is used in sewer, plumbing and other sanitary supplies. The material which goes into the structural part of a building which is furnished by the clayworker has not been appreciably influenced by the general tide of advanced prices. This is owing to the fact that a great many improvements have been set aside on account of the enormous increase in the prices of structural steel, this having reduced the otherwise actual demands for clay products, and thus has had the effect of restraining the advance in the prices of this material.

LABOR TROUBLES.

Notwithstanding the fact that wages have been advanced in many localities there are the usual number of strikes in progress. The greatest at present is at Cleveland, where all the street-car lines are tied up, the men refusing to work or permit others to do so till their union is recognized by the company. At St. Louis the extensive sewer pipe and fire brick works of Evens & Howard are idle for similar reasons. The Winkle Terra Cotta Company, a neighboring plant, is similarly situated. Mr. Winkle is reported as saying that he is unable to learn from his workmen the cause of the strike, though he has asked several. There is no dissatisfaction with wages or hours of work, but, for some reason known only to the union labor leaders, the men are forbidden to work and compelled to while away their time in idleness and dissipation. The cause of labor is not strengthened by such exhibitions, and those who participate are losers every time.

ABOUT ROOFING TILES.

In another column there is an inquiry about roofing tile, and a reply by George S. Tiffany, which will be read with much interest, for Mr. Tiffany is an entertaining and instructive writer. We have always had rather definite ideas on this subject of roofing tile, and have expressed them from time to time. All who ask questions on this subject show an undercurrent of feeling that there is some question as to the success or value of roofing tile. Take, for instance, Mr. Welch's first question: "Is roofing tile gaining in favor since its recent introduction?" In the first place, there is nothing recent about a tile roof. It is the oldest roof and the most successful house covering in use. Time has no effect upon it. Its hundreds of years of history has left it with an untarnished reputation. Of course, roofs may be made of tile which are not satisfactory. When that is done, however, we are not drawing on the world's knowledge. We are making drafts on some one's ignorance. In different parts of the world we find different types of roofs—the Spanish roll, the interlocking tile and the shingle tile—and all in their perfected form are successful.

There is no denying that the manufacture of roofing tile in this country has not been a pronounced financial success. The money has not been made from it that has been made from terra cotta and other finished clay products, and we believe the reason therefore is clear. With very few exceptions manufacturers of roofing tile have pushed a fancy-priced product instead of a low-priced product. Another reason why roofing tile has not been successful from a business standpoint is, because in some instances forms and methods of manufacture have been used which were not entitled to success. It is possible to make a tile roof that is not satisfactory, and many such have been made. This has been utterly without justification. There are many good forms, and our present technical knowledge in handling clays leaves no good reason for doubt or experiment.

There are some points in Mr. Tiffany's reply to Mr. Welch with which we are inclined to take issue. He speaks of the difficulty of introducing tile roofs into the northern countries of Europe. We know of no country which is harder on a roof than northern Germany or France, where, in the winter, it freezes at night and thaws during the day, with frequent snows, wind and rain. There is no climate more unfavorable to this material, and the extensive use of tiles in that part of the world proves that the people have no fault to find with that material. Another statement of Mr. Tiffany's to be questioned is that the shingle tile has the advantage over slate only in the matter of color. We think that the principal advantage in any tile roof is its fireproof quality. Slate, it is known, readily succumbs to heat and exposes the woodwork beneath. One of the most successful insurance organizations in this country will give no better rate on a slate roof than on one of pine shingles. The reason that tile roofs have not come into common use in this country ere this is because they are relatively expensive. When methods of manufacture enable them to be marketed at moderate cost they will become the common roofing material.

THE CHAMPION SCRAPPER.

Under this suggestive caption the able editor of the American Machinist discourses thus entertainingly on the wisdom of supplanting old machinery and methods with new improvements:

"The practical retirement from business of Andrew Carnegie is an event which it is impossible to allow to pass without notice. He has been a most prominent figure, if not the most prominent, in the phenomenal development of the iron and steel industries of the United States, and his advanced and aggressive methods have done much to bring us to successfully cope with the competing manufacturers of the world. He secured a rapid and enormous success, both for himself personally and for the business of which he was so long the leading spirit.

"The event of Carnegie's retirement suggests many lines of remark which have been and will be sufficiently exploited by others. He, of course, will not be known to posterity as an engineer, but as a pushing business man. Aside from his native ability, opportunity favored him. He went into the business just when its rapid growth was inevitable. At the close of the civil war the consuming capacity of the country grew with astonishing rapidity. The days upon which he fell were the days also of the most revolutionary discoveries and the most pronounced changes in the processes of iron and steel manufacture, and it was in the immediate adoption of each improvement that his success was secured. He kept his competitors on the run, and usually kept ahead of them. The successive adoption of the new involved the abandonment and destruction of the old, and this was done heroically and persistently. He has been, as we here venture to characterize him, the champion scrapper, meaning, of course, the maker of scrap. He made scrap of anything and everything, no matter what it had cost, without hesitation or delay, the moment it was possible to supersede it with something in which there was more profit. Perhaps no lesson is more needed by the average manufacturer than this, which is enforced by Carnegie's success. He believed in compound profits or in profits upon profits. Instead of pursuing the more prudent course of withdrawing and securing the profits that were assured they were continually invested in enlargements, improvements and reconstructions. He was always looking for the cheapening of output, and whatever stood in his way was removed and discarded, no matter how much it may have cost nor how much of a revolution in methods was involved in the change. He retained no machine or method for what it had done, but considered only present or potential efficiency."

Clayworkers are not entire strangers to scrap. On the contrary, there are few yards that do not boast (?) of large piles of scrap. Not infrequently in our journeyings among the brickmakers we are shown these relics and told with deep feeling that "there lie broken hopes and wasted means." Perhaps, after reflecting on Mr. Carnegie's record and its lessons, these owners of scrap may be consoled if not reconciled.

AN INTERESTING THEORY ILLUSTRATED.

There is a theory of the transmigration of souls which, during former ages, and at the present time, to a limited extent, has had many firm adherents. This theory involves the proposition that the soul may descend from a higher to a lower animal. For instance, a man may be whipping a horse, and, at the same time, be thrashing out the transmigrated soul of his first wife. In another instance of the same sort it has been suggested that a man killed at a high elevation might fall far enough so that in lighting on the ground he might again destroy in a fly the body containing the transmigrated soul which had just departed from his own body. Again, there is another theory that the soul transfers itself, or is transferred, from the lower to the higher animal. But it is not stated, so far as we know, in any record or theory, that in transferring from the higher to the lower or from the lower to the higher any of the facial expressions are carried along to the higher or the lower animal, as the case may be. We have, however, in this number of The Clay-Worker, what would appear to be a clear enough exposition of this theory. In his office in Chicago Mr. Gates has a bust of an Indian in terra cotta, and many of his friends have noticed that there is a distinct resemblance between the owner of the bust and the bust itself. Not that there are any traits of character which are common to our friend and any Indian of our acquaintance. But there can be no question as to the facial resemblance. Look at the picture on the first page, and then think of Gates. This parallel might suggest that there were once good Indians, and that this one, instead of going backward, had gone forward; that his soul had transmigrated from a lower to a higher level. In order to assume this, however, we must imagine that this Indian, who facially looks so much like Gates, must have died or been killed many years ago, and that there was the time between his demise and the present time for there to have been a transmigration of at least the facial expression to the generation of which Mr. Gates is a part. In any further discussion of this question both Mr. Eudaly and Purington are barred.

A CORRECTION.

Mistakes will happen in the best of regulated families. A typographical error in the May issue gave Mr. W. C. Mitchell's address Oelwein, O. It should have been Oelwein, Ia., as the reader may observe by turning to his ad. on page 562. Notwithstanding the error, Mr. Mitchell writes that he has received a gratifying number of inquiries. It would be very strange if some of the letters did not go to the dead letter office, so we suggest that those of our readers who wrote to Mr. Mitchell, and failed to receive a reply, try again, this time addressing him at Oelwein, Ia., and they will fare better, for Mr. Mitchell is a prompt and pleasant correspondent, and will tell those who want to know how to reduce fuel bills all about his system, which is proving very successful wherever tried.

KNEE DEEP IN JUNE.

BY JAMES WHITCOMB RILEY.

Tell you what I like the best—
'Long about knee deep in June,
'Bout the time strawberries melts
On the vine. Some afternoon
Like to jes' get out and rest,
And not work at nothin' else!

Orchard's where I'd ruther be—
Needn't fence it in fer me!—
Jes' the whole sky overhead,
And the whole airth underneath—
Sort o' so's a man kin breathe
Like he ort, and kind o' has
Elbow room to keerlessly
Sprawl out len'thways on the grass,
Where the shadder's thick and soft
As the kivvers on the bed
Mother fixes in the loft
Allus, when they's company!

Jes' a sort o' lazin' there—
S' lazy that you peek and peer
Through the wavin' leaves above,
Like a fellow 'at's in love
And don't know it, ner don't keer!
Ever'thing you hear and see
Got some sort o' interest—
Maybe find a bluebird's nest
Tucked up there as conveenently
Fer the boy 'at's ap' to be
Up some other apple tree!
Watch the swallers skootin' past,
'Bout as peert as you could ast;
Er the Bob White raise and whiz
Where some other's whistle is.

Ketch a shadder down below,
And look up to find the crow—
Er a hawk—away up there,
'Pearantly froze in the air!
Hear the old hen squawk, and squat
Over 'ever' chick she's got,
Sudden-like! And she knows where
That 'ere hawk is well as you!
You jes' bet yer life she do!
Eyes a-glitterin' like glass,
Waitin' till he makes a pass!

Peewees' singin', to express
My opinion, 's second-class,
Yit you'll hear 'em more er less;
Sapsucks gittin' down to biz,
Weedin' out the lonesomeness;
Mr. Bluejay, full o' sass,
In them baseball clothes o' his,
Sportin' 'round the orchard jes'
Like he owned the premises!
Sun out in the fields kin sizz;
But flat on yer back, I guess,
In the shade's where glory is!
That's jes' what I'd like to do
Stiddy fer a year er two!

Plague ef they ain't somepin' in
Work 'at kind o' goes ag'in'
My convictions! 'Long about
Here in June, especially!—
Under some old apple tree,
Jes' a-restin' through and through,
I could git along without
Nothin' else at all to do
Only jes' a-wishin' you
Wuz a-gittin' there like me,
And June was eternity!

Lay out there and try to see
Jes' how lazy you kin be!
Tumble round and souse yer head
In the clover bloom, er pull
Yer straw hat acrost yer eyes
And peek through it at the skies,
Thinkin' of old chums 'at's dead,
Maybe, smilin' back at you
In betwixt the beautiful
Clouds o' gold and white and blue!—
Month a man kin railly love—
June, you know, I'm talkin' of!

March ain't nothin' new!—
Aprile's altogether too
Brash fer me! And May—I jes'
'Bominate its promises—
Little hints o' sunshine and
Green around the timberland—
A few blossoms, and a few
Chip-birds, and a sprout er two—
Drap asleep, and it turns in
'Fore daylight and snows ag'in!
But when June comes!—Clear my throat
With wild honey!—Rench my hair
In the dew, and hold my coat!
Whoop out loud! and th'ow my hat!—
June wants me, and I'm to spare!
Spread them shadders anywhere!
I'll git down and waller there—
And obleeged to you at that!

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For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

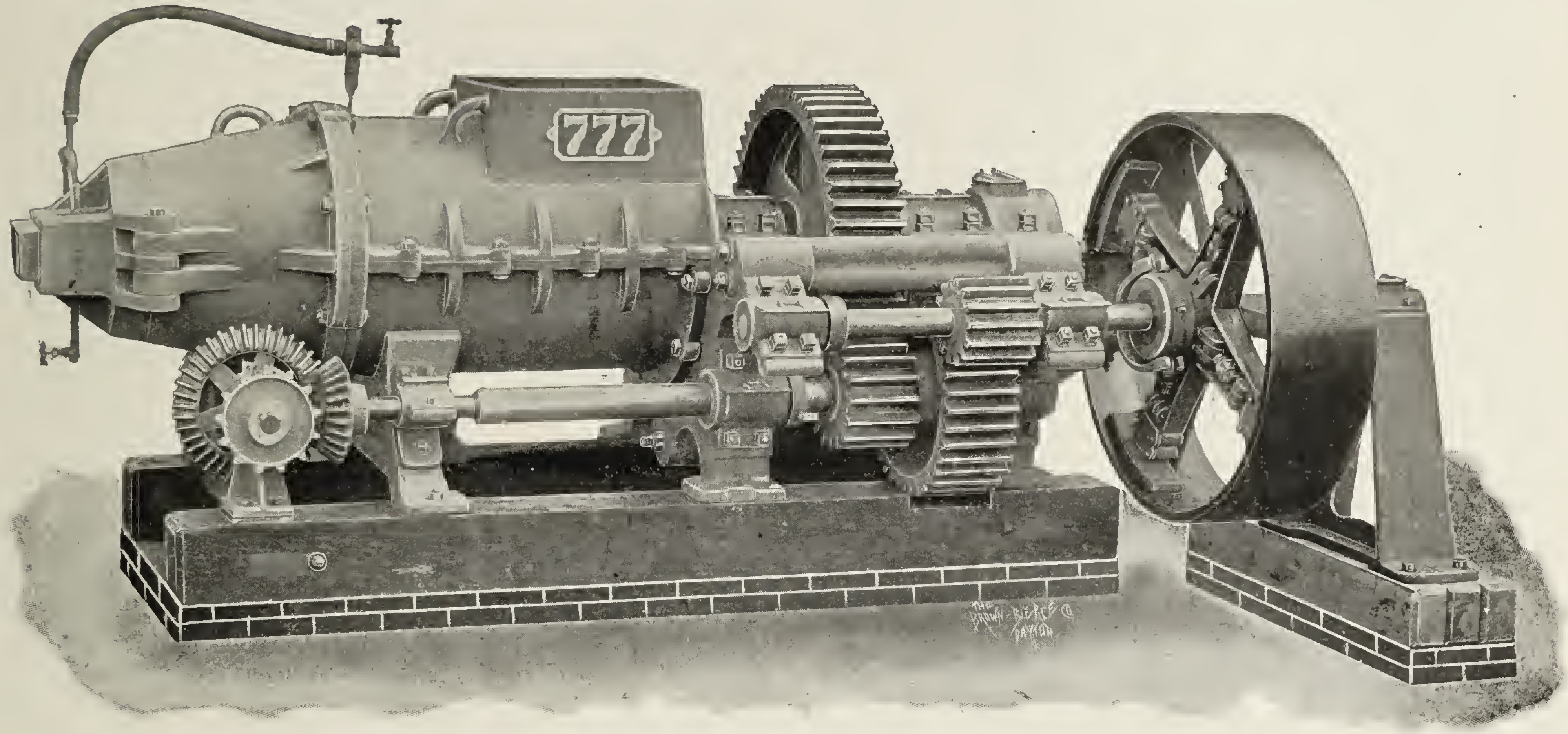
Beautiful Homes

ARE BUILT WITH

Beautiful Brick

MADE BY

Beautiful Machinery.

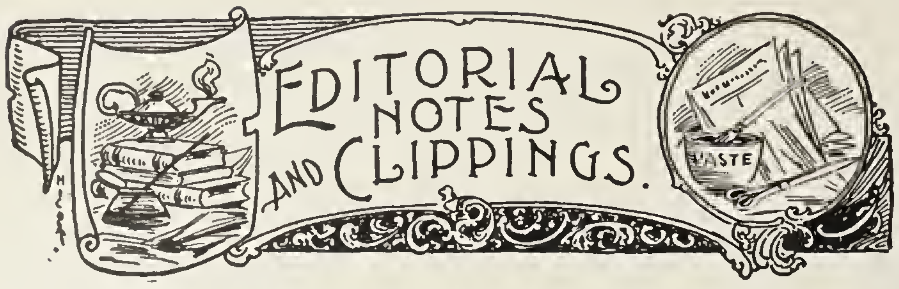


777 BRICK MACHINE.

RAYMOND'S BRICK MACHINERY

Leads all others for high character of its construction, Greatest producing power, Most perfect product.
All Raymond Brick Machines ever sold are in daily use. Unimpeachable testimony from manufacturers of highest standing
Our 1899 Catalogue, just out, upon application.

C. W. RAYMOND & CO., Dayton, Ohio.



EDITORIAL NOTES AND CLIPPINGS.

West Union, W. Va., is to have a new brick plant.

L. K. Moss is building a large brickyard at Morris, Ala.

Carson Bros. will establish brick works at Wharton, Tex.

Mouk & Butler are putting in a new brick plant at Arcadia, La.

Caswell Bros. are making brick at Colden, near Renfrew, Ontario.

J. M. Russell will establish a new brick and tile plant at Sioux City, Ia.

T. G. Zugelder will make some additions to his brick plant at Gunnison, Col.

A company will be organized at Salem, O., to manufacture enameled brick.

G. H. Struve is at the head of a firm that will manufacture brick at Oxford, Neb.

A brick and tile factory is needed at Kirkman, Ia. For particulars address S. L. Beaver.

G. H. Struve is at the head of a concern that will manufacture brick at Oxford, Neb.

W. W. Dickerson sustained a slight loss by fire at his tile plant, at Sedalia, O., recently.

F. E. Gates is authority for the statement that a brick and tile plant is wanted at Adair, Ia.

Ed Davis has started a brickyard at Bigtimber, Mont., where there is a good demand for brick.

Terrell Pressed Brick Company, Terrell, Tex., has been incorporated with a capital stock of $20,000.

The Conway Brick and Tile Company is a new enterprise at Conway, S. C., turning out a good quality of brick.

Considerable damage was caused at O'Bryan & Green's brickyard at Greenville, Ky., by the collapse of a brick kiln.

C. Clayton Bourne has leased the brickyard of E. F. Richards at Fishkill-on-Hudson, N. Y., for a period of ten years.

The Gay Head Fire Brick Company has been incorporated to manufacture brick at Saco, Me. Capital stock is $300,000.

The Des Moines (Ia.) Brick Company is going to manufacture hollow building block, in addition to its regular output.

Conrad Doerfler has made some improvements at his plant at Waverly, Ill., and in the future will make tile as well as brick.

Walter and Albert Page have purchased the brick plant of W. C. Page at Lebanon, Tenn., and will operate same in the future.

Forest City, Ia., wants a brick and tile plant. Those interested may obtain desired information by addressing Jasper Thompson.

D. G. Courtney's tile plant, at East Gallipolis, O., was burned to the ground June 6. The loss is $3,000, on which there is no insurance.

M. J. Scheiderer, the well-known brick and tile manufacturer at Richwoods, Ill., will put in machinery for the purpose of making roofing tile.

S. J. Heafield has purchased the Caldwell brick plant at Menomonie, Wis. A new company has been organized and operations will be resumed at once.

The Capital City Brick and Pipe Company, at Des Moines, Ia., is preparing to go into the manufacture of hollow brick and building tile on a large scale.

Jas. Brophy, foreman of Morrisey & Co.'s brickyard at Grassy Point, N. Y., fell from the top of the kiln and sustained injuries from which he died almost instantly.

The De Soto Land and Brick Company has been incorporated at Memphis, Tenn., by J. Lee, A. C. Treadwell, J. M. Peetus and others, with $30,000 capital stock.

An employe of B. Kreischer & Sons, at Kreischerville, N. Y., while working near some of the machinery had his clothing caught in the cogwheels and before the machinery could be stopped was so horribly mangled that he died a short time after the accident.

The Merrimac Manufacturing Company contemplate the establishment of a brick manufacturing plant at Huntsville, Tenn., where it will turn out 100,000 brick daily.

J. A. Koehler writes that there is a good demand for brick and tile at Benton, Ringgold county, Iowa, and that it will pay a good man to establish a brick and tile plant.

Mr. Edwin Schmults, a well-known Jersey brickmaker, is slowly recovering from an operation for appendicitis, with all prospects at present of regaining his usual health.

All of the brickyards at Statesville, N. C., are running full blast. The yards include those of Isidore Wallace, Messrs. Morrison Bros., Brown & Hudson and W. E. Morrison.

A. Smith and brother are making preparations to build a new brick plant at Kingston, N. Y. Ground has already been broken and the work will be pushed as rapidly as possible.

Anderson High-Grade Brick Company has been incorporated at Newark, N. J. David J. Anderson, Alonzo J. Wilcox and F. H. S. Morrison are the incorporators. Capital stock $150,000.

Cony & Fuller have their plant at Augusta, Me., running to the full capacity. They have recently booked two orders for half a million each, and are shipping a carload or more each day.

The tile plant of Joseph Major, at Farmer City, Ill., was completely destroyed by fire on the morning of the 9th. The loss is estimated at $10,000. Mr. Major carried $6,000 insurance.

The Illinois Manufacturing Company, successor to the Frost Sewer Pipe Company, at Macomb, Ill., is increasing the capacity of the plant, and is in the market for supplies of all kinds.

Matthew Boyd, sr., an old-time brick manufacturer of Chester, Pa., died at his home there. He was eighty-two years old and had lived in the house in which he died for fifty-eight years.

A superior quality of clay has been discovered at Rockaway, N. J., where McEwan Bros. have organized to manufacture brick. They expect to have the plant ready for operation by Sept. 1.

The F. H. Wolf Brick Company has purchased eight acres of land at Wyandotte, Mich., on which they will erect a brick plant which they hope to have ready for operation in the near future.

There is rumor of a big paving brick plant to be established at St. Joseph, Mo., in which B. P. Waggener and J. A. Bendure are interested. They will put up a plant with 250,000 daily capacity.

The postmaster at Delta, Pa., is authority for the statement that there is an opening for a clayworking plant, and that local capital can be secured toward forming an enterprise of this kind.

The brick works of D. E. Childs, at Findlay, O., have resumed operations after a three years' shut-down. They now have orders that will justify their running all the rest of the season.

Gordon & Kestler will establish a brick plant at Bonner Springs, Fla., where a fine quality of clay has been discovered. Ground for the plant has been broken and work will be pushed as rapidly as possible.

The brick works of Jno. Emmer, at New Iberia, La., were damaged to the extent of $7,000 by fire, which started in the kiln sheds. Mr. Emmer writes that he will rebuild at once. He carried about $4,000 insurance.

Through the efforts of the Health Department arrangements have been made to pave with vitrified brick all of the pens and alleys at the Union Stockyards, Chicago, Ill., covering a section of about 20,000 square yards.

An immense brick manufactory is to be established at Colorado Springs, Col., by Forbes & Ware, who have been in the brick business for some time, but will now branch out and put in machinery for making pressed brick.

Russell & Duncan, Ltd., engineers and contractors, 28 Victoria street, Westminster, London, S. W., England, write for information for American molds for the manufacture of sewer pipes of sand and cement concrete, in sizes from six inches to eight inches, with and without sockets, in usual lengths of about four feet, delivered f. o. b. New York, giving

CONTINUED ON PAGE 546.

The "Monarch" BRICK.... MACHINE,

Unquestionably the

Leading Horizontal "Soft=Mud" Machine.

More in use than other of its class.

◆

The

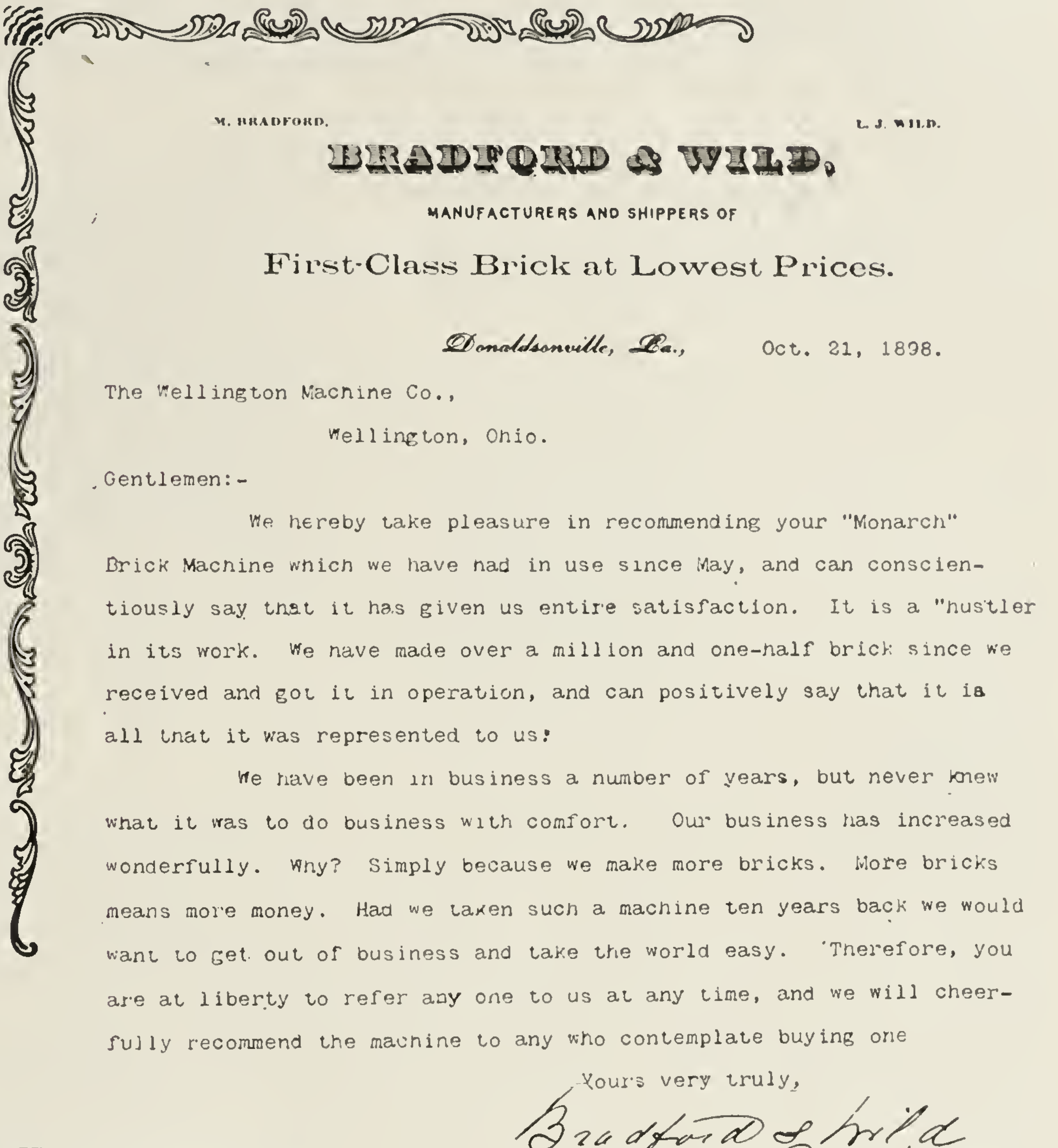
"Iron Quaker" Brick Machine

Unquestionably the

Leading Upright "Soft=Mud Machine.

Horse and Steam Power.

More "Quaker" Machines in use than any of its class.



M. BRADFORD. L. J. WILD.

BRADFORD & WILD,

MANUFACTURERS AND SHIPPERS OF

First-Class Brick at Lowest Prices.

Donaldsonville, La., Oct. 21, 1898.

The Wellington Machine Co.,
Wellington, Ohio.

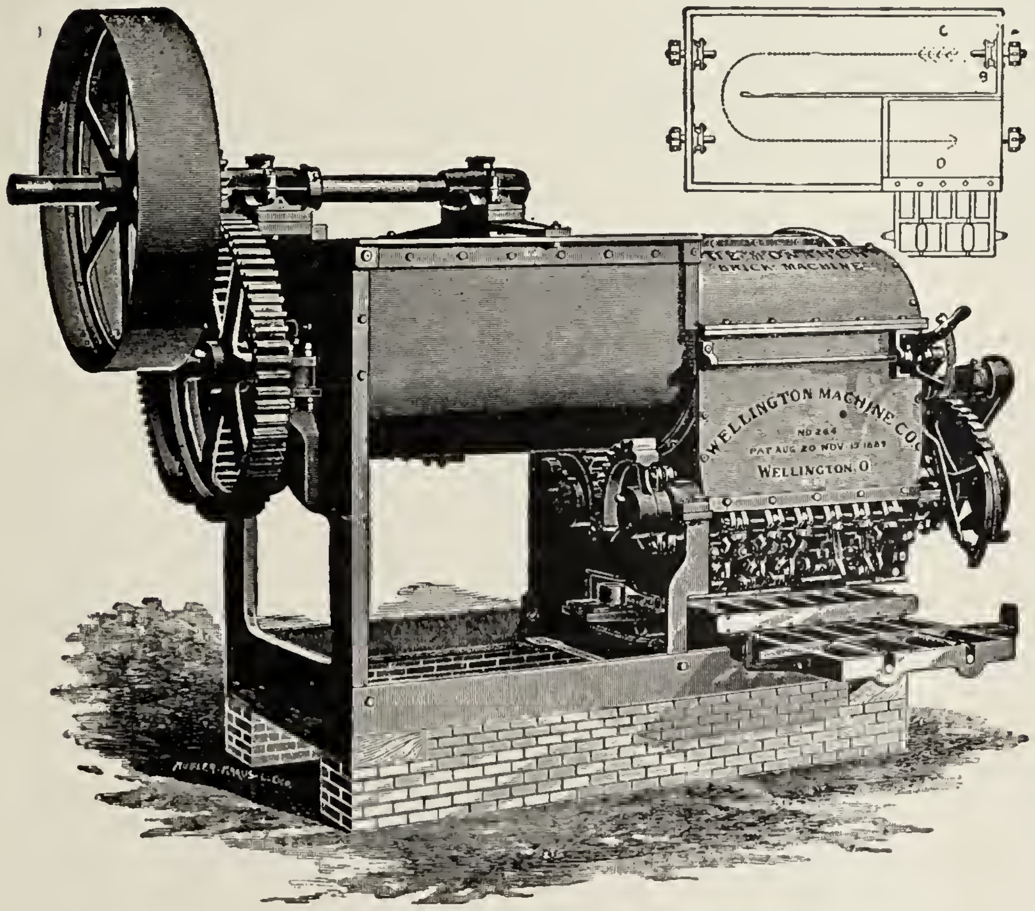
Gentlemen:-

We hereby take pleasure in recommending your "Monarch" Brick Machine which we have had in use since May, and can conscientiously say that it has given us entire satisfaction. It is a "hustler in its work. We have made over a million and one-half brick since we received and got it in operation, and can positively say that it is all that it was represented to us.

We have been in business a number of years, but never knew what it was to do business with comfort. Our business has increased wonderfully. Why? Simply because we make more bricks. More bricks means more money. Had we taken such a machine ten years back we would want to get out of business and take the world easy. Therefore, you are at liberty to refer any one to us at any time, and we will cheerfully recommend the machine to any who contemplate buying one

Yours very truly,

Bradford & Wild
Per L. J. Wild



We have the Best and Lowest Priced

Mold=Sander.

◆

No one else makes . . . .

BALL-BEARING TRUCKS and BARROWS.

The Greatest Improvement in small articles ever put upon a brickyard.

◆

ALL OTHER AUXILIARY TOOLS, MACHINES AND SUPPLIES.

The Wellington Machine Co.,

Send for Circular. **Mention the Clay-Worker** ***WELLINGTON, OHIO.***

EDITORIAL NOTES AND CLIPPINGS—Continued.

weights for the purpose of calculating freight to Europe, and such other information as may be convenient in connection therewith.

E. Outen and A. Hewlett are making preparations to manufacture pressed brick at Princeton, Ky.

The Genesee Clay Manufacturing Co. has been incorporated to manufacture brick and tile at Genesee, N. Y.

A plant for the manufacture of paving brick is talked of at Sullivan, Ind. J. R. Brown and Dr. G. G. Billman are interested.

The Lawrence (Kan.) Brick and Tile Co. has been incorporated by A. Monroe, M. Robinson, J. N. Roberts and others. Capital stock is $32,000.

The Leonardtown Brick Co. is the name of a concern recently incorporated to manufacture brick at Leonardtown, Md. Operations will commence at once.

Frank Field, Salt Lake City, Utah, writes us that he will open up a brick plant on a small scale, operating a two-horse-power machine, and wants The Clay-Worker, too.

A. C. Luff and Richard Tunswell recently established a brick plant at Trial, B. C. The demand for their product has increased to such an extent that they are considering the advisability of putting in additional machinery.

At a recent meeting of the Lawrence (Kan.) Vitrified Brick and Tile Company plans were completed for the immediate construction of the new plant. A. Monroe is president of the concern and A. Marks secretary and treasurer.

Kern, Moyse & Co. have leased the St. Tammany Brick Works, near New Orleans, La., and are putting same in condition to run full capacity the coming season. Mr. Charles F. Ryan is general manager, with offices 829 Canal St., New Orleans.

Our Washington correspondent advises us that the brick plant of E. Frost & Co., which was just being built at Fairview, on the Potomac river, below Washington, D. C., was totally destroyed by fire recently. The loss was $20,000, on which there was no insurance.

The brick and tile plant formerly owned by Manter & Andress at Eaton, O., has been purchased by a new company, which will overhaul the old plant and at present they will only turn out drain tile. The new firm consists of E. C. Manter, C. H. Snow, A. J. Phipps and others.

Howard & Ingram have their new plant at Columbus, Ga., in operation. The plant is located about four miles out from Columbus, on the Mobile & Girard R. R., at a little station called "Bryke." The yard is equipped with Chambers machinery, turning out 45,000 brick daily. Mr. H. M. Howard has charge of the brickyard.

Wm. H. Hunt, general manager of the Cleveland (O.) Hydraulic Press Brick Company, writes that there is an increasing tendency towards the use of pressed brick, and that their sales for the current season have been greater than during any twelve months previous, and the outlook for the balance of the season is very good.

In a recent letter T. C. Lundy, Farmingdale, L. I., N. Y., renewing subscription to The Clay-Worker, says: "May was the banner month for sales, as we have sold more this month than any month since my connection with the company (the Garden City Company). Business is steadily increasing and prospects were never better."

The St. Louis brick manufacturers are having trouble with strikers again. The men at the Winkle Terra Cotta Company, Evans & Howard and the Missouri Brick and Tile Company asked for an increase of 15 to 20 cents a day. The latter firm granted the demand and the men went back to work. So far the other companies have not adjusted the difficulty.

F. Vogt, secretary of the Milwaukee Building Supply Company, has issued notices of another advance in the price of brick. The increase is one of 50 cents a thousand on all grades, and the prices now prevailing are $7.50 a thousand for common brick, $8.50 for sewer brick, $10.50 for select brick and $15.50 for angle brick. Mr. Vogt says the change is due to the advancing of coal from $3.35, paid last year, to $3.90 a ton, and of wood from $3 a cord to $3.75, as well as an advance of 15 per cent. paid in wages to labor.

In a recent letter, A. J. Daniels writes that the Seven Hills Brick Company is the name of a new firm at Owensboro, Ky., organized for the manufacture of building, fire, paving and ornamental brick, sewer pipe, drain tile, terra cotta and other clay products. They have a capital stock of $10,000 and will be in the market in the fall for additional machinery. Mr. Daniels writes that the plant is ready for operation, "but to complete the equipment must have a copy of the Clay-Worker, so put us on your mailing list and send bill." All correspondence should be addressed to Mr. Daniels.

The immense plant of the Lower Brick Company, Sioux City, Ia., was badly damaged by fire last month. The flames started in the kiln sheds during a terrific rainstorm. The yard was too far away from fire protection, and the men fought the fire with buckets, and Mr. Lower counts himself lucky that the entire plant was not lost. The loss is estimated at $7,000.

The works of the National Kaolin Company have been purchased by the Continental Clay Product Company, and a number of improvements are being made in the plant, including the building of new dryers and kilns and putting in additional machinery. The daily output will be 65,000, which will be increased when necessary. They turn out a white brick, for which there is a good demand.

The new plant of the Altoona (Pa.) Brick and Tile Company is rapidly getting in shape for operation, and they hope to be turning out brick before the close of the month at the rate of 20,000 daily. The officers of the new company are Jno. De Haven, president and general manager; C. W. Moore, secretary and treasurer, and J. M. Hughes, W. C. Brennecke, C. W. Moore and Jno. De Haven, directors.

W. S. Wedge, secretary of the Omaha (Neb.) Builders' and Traders' Exchange, writes that the brick trade in that vicinity is excellent, with prices for common and stock brick at $6 and $7. The brickmakers there have not got "a little understanding," but some of them would like to have, as they think they would profit by the same. Mr. Wedge says our good friend, J. Fred Smith, has so much business on hand he can neither take time to write, sleep nor eat.

By direction of the President Acting Secretary of War Meiklejohn has issued important new customs regulations to the military authorities in Cuba, Porto Rico and the Philippines. Section 4 provides that "bricks, glazed and unglazed, for building purposes, as well as undressed common and fine lumber, are hereafter to be admitted into all of the ports of Cuba duty free. Articles of fire clay introduced into the island will pay only 30 cents per 100 kilos."

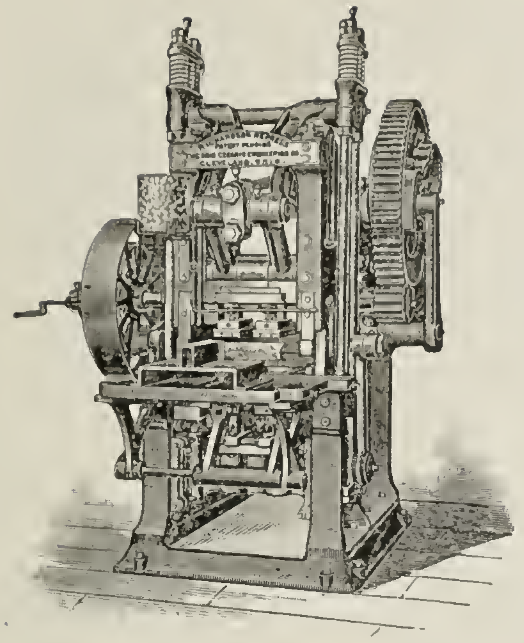
Elias Petts writes that the brick plant with which he is connected at Shreveport, La. (the Oliff Brick Works), is running full time, with a daily capacity of 30,000 to 35,000 brick. Business generally at Shreveport, he says, is quite up to the average. The McCormac Press Brick Works are not running at present, owing to limited kiln capacity, but will soon start up again. Two streets at Shreveport are being paved with brick, one with brick from Coffeyville, Kan., and the other with brick from Pittsburg, Kan.

W. L. Mitchell advises us that the Oelwein (Ia.) Brick and Tile Company is very busy, and has orders on its books sufficient to keep it running for several months. The plant has a daily capacity of 20,000 stiff mud and 15,000 press brick. Mr. Mitchell is constructing sixteen of his slack coal and coking furnaces for the company. He says fuel is quite an important item there, as coal sells for $3.30 per ton on board cars, while slack can be procured for half that amount. Common brick bring $6.75 per thousand and pressed brick $15.

L. G. Kilbourne, president of the Columbus (O.) Brick and Terra Cotta Company, advises us that his firm is very busy, having more orders on its books than ever before at this season of the year. Among recent buildings for which it has furnished brick are the following: Deaf and Dumb Institution, Columbus, O., dark gray and dark buff; St. Hedwig's Church, Chicago, Ill., dark gray; Colored Baptist Church, Lynchburg, Va., light buff; Presbyterian Church, Lynchburg, Va., light gray; South High School, Columbus, O., light buff; public school, Polo, Ill., dark buff and light gray; United Brethren Church, Union Furnace, O., dark buff. They also report large sales of their mottled shades in New York, Rochester, Pa., Detroit, Mich., Marion, Ind., and Columbus, O. In the latter city they have under construction over forty structures, in various shades of their buff, terra cotta and gray; also several fronts of glazed bricks. They have orders entered for several hundred thousand Romans, including one large operation in Troy, N. Y.

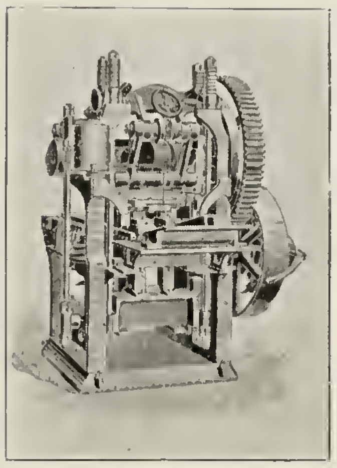
The most sadly disappointed man in the United States was the one who sat up all night waiting for the kiln to cool off so he could get the ashes of all the wood that was burnt in the arches.

WHICH PRESS DO YOU WANT?



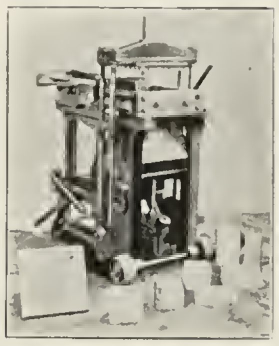
RICHARDSON DOUBLE MOLD STEAM REPRESS.

We also make Dry-Presses, and the Sword Brick Machines.



CENTURY DOUBLE MOLD STEAM REPRESS.

ALL SIZES,
ALL PRICES.

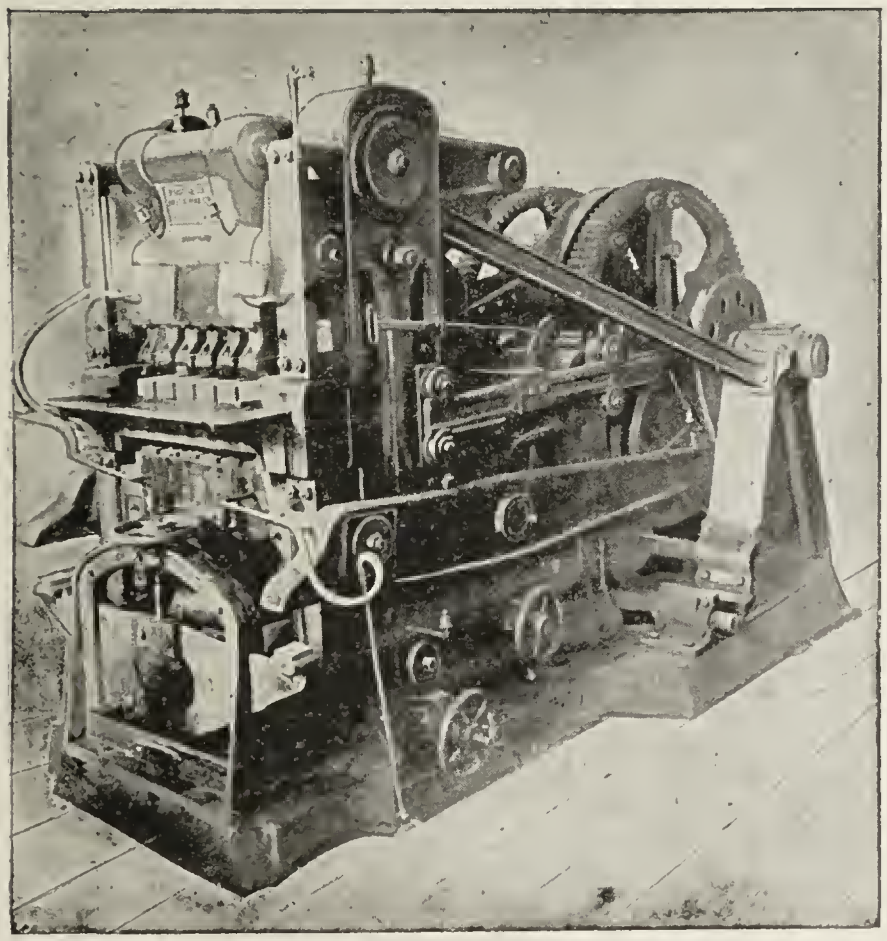


DOUBLE MOLD HAND REPRESS.

SINGLE MOLD HAND REPRESS.

The OHIO CERAMIC
ENGINEERING COMPANY,
CLEVELAND, OHIO.

The Progress Brick Press.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE ON APPLICATION. . . . .

Progress Press Brick and Machine Co.,
King's Highway and Oak Hill R. R. *ST. LOUIS, MO.*

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED — To purchase a four-mold brick press, the Simpson machine preferred; state lowest price. Address M.,
6 1 cm Care Clay-Worker.

FOR SALE — One four-foot stationary wet pan, bottom driven, with steel dust cover; almost new; Phillips & McLaren make; cheap. KENDALL & FLICK,
618 Penn. ave. N. W., Washington, D. C.
6 1 d

FOR SALE — The plant and property of the Frankfort Brick Co.; the only plant in the city; good chance for investment. Address for particulars
JOHN T. BUCKLEY, Frankfort, Ky.
6 1 cm

WANTED — Position as superintendent on a first-class dry-press brick plant; lifetime experience; A-1 burner and well up in colors such as buff, gray, tan, iron spots, etc.; can give best of references. Address
6 1 pm P. A., care Clay-Worker.

FOR SALE — One 8-foot pug mill; has seen less than sixty days' service; also 60 iron-clad brick dry cars, gauge 23½ inches.
PIONEER FIREPROOF CONSTRUCTION CO., 1515 Marquette Building, Chicago.
6 1 dm

WANTED — Position as superintendent or burner of either dry pressed or plastic brick works; thoroughly practical in every department of manufacturing same; No. 1 references given. Address ST. LOUIS,
6 tf d Care Clay-Worker.

FOR SALE — Brick and tile yard in fine Ohio town must be sold at a great sacrifice; a splendid opportunity, and will prove a fortunemaker to parties with small capital. SUSSER & ESTEE,
6 1 cm 421 Garfield Bldg., Cleveland, O.

FOR SALE — Cheap and on reasonable terms, a brick plant consisting of a J. D. Fate stiff mud machine, Martin soft mud, an automatic repress and cutter, two new down-draft kilns; demand for entire supply; reason for selling poor health; a great bargain. Address WOOD,
6 1 dm Care Clay-Worker.

FOR SALE — Brick plant located in Barronette, Wis., on the O. Ry.; good shipping point to Ashland, Wayburn, West Superior and Duluth; 17 acres of clay land, 40 feet deep; all new. machinery, steam power complete, with wood pallets, dry-house; kiln capacity 390,000; wood $1.20 per cord; price, $6,000. Address
6 1 d P. LARSON, Barronette, Wis.

BRICKYARD FOR SALE.

In New Jersey, 54 miles from Philadelphia, with buildings and machinery; clay of good burning quality immediately adjoining; only small amount capital required from reliable person; ready sale of output. Address, with references,
BARON DE HIRSCH FUND,
6 3 cm 45 Broadway, New York.

WANTED TO BUY.

New or second-hand machinery, in first-class conditon; 50 to 60 horse-power engine; 80 to 90 horse-power boiler; one Blunger, one sifter, one pump (double), one filter press, one pug mill, one wad mill, two glaze mills, four jolleys, shafting, belting, shelving, driers, steam piping, etc. If second-hand must be but little used, and guaranteed to work perfectly or no sale. Address,
The BREWER POTTERY & CLAY MFG. CO.
6 1 d Warren, Ohio.

WANTED — A position as superintendent of brick works; 30 years' experience; can remodel works if desired; first-class references. Address MISS,
6 2 c Care Clay-Worker.

WANTED — Party well acquainted with builders and contractors of Chicago wants agency of good line of builders' material on commission. Address W.,
6 1t 1d Care Clay-Worker.

FOR SALE — Yard rights of the Swift stack, coal, coking table, furnace, kiln, together with guarantee and protection; send for price list and catalogue. F. E. SWIFT,
6 1 d Washington, Ia., U. S. A.

FOR SALE — Two Simpson four-mold, dry-press brick machines, complete and in good order; very cheap.
WM. GRUENDLER, 928 N. Main st.,
6 1 dm St. Louis, Mo.

WANTED — A good brickmaker who understands the management of men and has had experience in both the dry press and stiff clay process, to take the formanship of a plant in the Northwest. The right man will be given permanent employment at good wages. Also want a first-class burner who is familiar with both up and down draft kilns. Experienced reliable men wanted, none other need apply. Address, with references, PARRY,
6 1 d care Clay-Worker.

St. Louis Terra Cotta Co.,

....MANUFACTURERS OF....

Architectural and Ornamental Terra Cotta.

Works and Office, 5801 Manchester Ave.,
ST. LOUIS, MO.

In Stock: Diaper Tile of all sizes, Caps, Coping, String and Belt Courses, Panels, Skewbacks, Etc.

ESTIMATES FURNISHED ON APPLICATION.

WE HAVE RECENTLY ISSUED OUR

CATALOGUE No. 25

A Book of 380 Pages.

Which contains detailed descriptions and prices of **Conveying, Elevating and Power Transmitting Machinery, such as Caldwell Helicoid Conveyor, Elevator Buckets and Boots, Belting of all kinds, Pulleys, Shafting and Bearings, Car Pullers, Wire Cloth, Perforated Metal, Equipment for Rope Transmissions, etc.,** and much useful **Engineering information** applicable to our line of specialties. A Postal Card from anyone interested in the machinery manufactured by us will bring a copy by return mail.

H. W. CALDWELL & SON CO., 127-133 West Wash. St., CHICAGO, ILL.

FOR SALE.

Two Penfield Brick Machines with Pug Mill—all iron—six moulds.

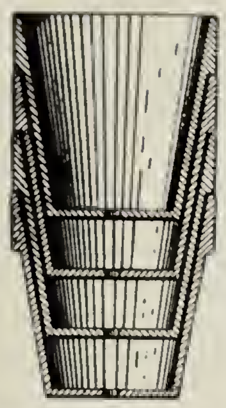
One Simpson Dry Press Machine.

These machines are in good order and can be seen at our Ruchs Hill Brickyard, Pittsburg, Pa.

We will gladly answer all communications regarding the sale of same.

BOOTH & FLINN, Limited,
PITTSBURG, PENN.

Mention the CLAY-WORKER,
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St., INDIANAPOLIS, IND.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS Agent and Patentee, 161 Grand Street, Rahway, N. J.

A MESSAGE TO CLAYWORKERS

Leviathan is the one belting you can always depend upon to do its Duty.

FIRST. Because it will stand more continuous hard work than any other.

SECOND. Because its strength, driving and traction power excel any other.

THIRD. Because it gives satisfaction year after year, even when doing the heaviest work in an atmosphere clouded with the dust of the Clay Manufactory, or subjected to the underground dampness and water-drippings.

Main Belting Company,

Sole Manufacturers LEVIATHAN BELTING,

1221-41 Carpenter St, Philadelphia.

55-57 Market St., CHICAGO. 120 Pearl St., BOSTON.

FOR SALE — One Simpson four-mold brick press of latest design, also one two-mold Simpson press from latest patterns; the most reliable and up-to-date machine in the market; also one second-hand Raymond hand repress. Apply to
WESTERN MACHINE & SUPPLY CO.,
6 1 cm 159-161 La Salle st., Chicago.

POSITION WANTED — A practical terra cotta man, one able to model, model make or mold, take off quantities and give prime cost of work, has erected his own kilns; the last ten years in charge of Architectural Terra Cotta Works; best of reference given; at present seeks a position. Apply
6 1 d M. J., care Clay-Worker.

FOR SALE — Brickyard in good running order, splendid location on water front between thriving cities of Seattle and Tacoma, Wash.; unlimited supply of No. 1 clay; bank 200 feet high, immediately back of machine; sand bank adjoining; horse-power Quaker machine, pallets, etc.; wharf, buildings, 20 acres land, grade water; wood $1.75 per cord delivered; price, $2,500. Address
GEO. H. BURROWS,
Burton, Wash.

FOR SALE — Valuable site containing 35 acres of clay and coal lands, with 9 down-draft kilns, 100 H. P. engine, 3 boilers of 40 H. P. each; also considerable machinery; located near Zanesville, O.; water frontage on the Muskingum river and ample railroad facilities; clays unsurpassable for all clay products, for which Zanesville is celebrated: will sell at a bargain. Address
O. F. McKINNEY, Zanesville, O.
6 1 dm

FOR SALE — One of the best plants in Pennslyvania, situated on railroad, within 50 miles from Pittsburg, now running on high grade repress, dry press, white, gray, mottled, Roman and Pompeiian facing brick, fire clay, etc.; present capacity of machinery 40,000 daily; can be increased to 100,000; all machinery, kilns, engine, boiler, etc., in first-class condition; satisfactory reasons given for selling. For particulars address
G. C. H.,
6 3 cm 132 River st., Cleveland, O.

FOR SALE —Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address
OLD BRICKMAKER,
6 tf d Care Clay-Worker.

PRINCETON, IND.,

Has splendid clay and shales for either builders or pavers and cheap fuel; wood $1.25, coal 30c up. Parties desiring location write to
S. A. DAY, Secy.,
6 1 d Box 323.

KENNEDY CLAY AND SHALE CRUSHER.

It will pay any one wanting a clay crusher that will pulverize small lime and flint stones in their clay to investigate the Kennedy clay and shale crusher. It is the only crusher that will grind very fine without clogging any kind of clay or shale, no matter how soft, tough or hard it may be. It will do the work of two dry pans. All our crushers guaranteed as represented or no sale. A reasonable time allowed to test crusher. Address
THE KENNEDY BRICK MCHY. CO.,
6 1 cm 723 Peach st., Erie, Pa.

TO MANUFACTURERS OF FIREPROOF BUILDING MATERIAL.

I have a brickyard located on the Delaware river, about 20 miles from Philadelphia, containing 30 acres, with a 20-foot bank of bastard fire clay, very suitable for manufacturing fireproof building material, etc.

I would put this entire plant, clear of incumbrance, at a cash price in a stock company, or would make liberal arrangements with a competent party who could manage the entire works.

The difference in the freight alone on this material used in the Philadelphia market would be a handsome profit, and there is a good market here for all that could be made.

This location is also convenient for shipping by either water or rail to other points where this material is being extensively used.
MURRELL DOBBINS,
No. 24 S. Seventh st., Philadelphia, Pa.
6 2 d

FOR SALE — One of the best paying brick and tile factories in Iowa.
12 tf d Lock Box 36, Lohrville, Ia.

FOR SALE — Complete outfit for chemical laboratory for clayworks. Address
5 3 d MARKET, care Clay-Worker.

FOR SALE — At a bargain, about 4,000 second-hand Canton floor brick.
PRESTON BRICK CO.,
6 1 d Hornellsville, N. Y.

FOR SALE — 150,000 new and second-handed pine pallets, 32 and 34 inches long, ten wide.
J. F. STENGEL,
1 6 c Ellicott Square, Buffalo, N.Y.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — Several second-hand chain hoists, from 2 to 8 tons capacity; also several engine lathes, boilers, engines, pumps, etc. Address CLEVELAND,
3 tf d Care Clay-Worker.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer,
6 tf d Wellsburg, W. Va.

FOR SALE — One automatic end cut Chambers machine; 25,000 daily capacity; all complete and in first-class condition; a bargain. Write
CHAMPION BRICK WORKS CO.,
4 2 dm Wellsville, O.

FOR SALE — A brickyard with annual output of 400,000; drying sheds, good brick residence; five acres of land well set in fruit; good market. Address
W. A. BABCOCK, Ipava, Ill.
4 3 cm Or J. R. GAIN, Kokomo, Ind.

FOR SALE—GREAT BARGAIN—Henry Martin "A" Brick Machine, capacity 30,000, very good order; pug mill, crusher, elevator, shafting, etc, $750. All in first-class working order.
1 tf dm BOX 13, care Clay-Worker.

FOR SALE — One good 35 H. P. Chandler & Taylor engine; 40 H. P. tubular boiler; hot and cold water pumps; all in good condition. Will be sold cheap.
C. & A. POTTS & CO.,
5 tf d Indianapolis, Ind.

FOR SALE — Three Eagle represses, as good as new; scarcely used at all, owing to change of process, making repressing unnecessary; they are the latest improved design, and will be sold at a bargain. Address BUSY BOY,
5 y d Care Clay-Worker.

WANTED — By a practical man of thirty years' experience a place as superintendent of an up-to-date brick works. Will be pleased to refer any who need a good man to my last places for character and ability.
SUPERINTENDENT,
5 2 c m care Clay-Worker.

FOR SALE — Controlling interest in a vitrified paving brick plant; daily capacity, 60,000; five down-draft kilns, 200 capacity each; fine shale bank, with four-foot vein of coal under property; one of the best locations in the Southwest; to a practical brick man this is a fine opening. Address
4 3 c GAR, care Clay-Worker.

FOR SALE — A Ross Keller tripple pressure six-mold, dry-press brick machine, capacity 35,000 per day; used only 90 days; in first-class condition; one revolving dirt screening machine; 15 tons of four-foot grate bars, belting, shafting and pulley wheels, two iron tanks, 7 ft. by 10 ft.
GEO. MATHERS, 960 Nassau st.,
5 3 dm Cincinnati, O.

FOR SALE—Four-mold Boyd Dry pressed brick machine, quite new, at half cost. Capacity 25,000 to 30,000 per day. Also one 4-mold Eureka dry pressed brick machine, good order; great bargain. One straight line engine, 14x14 cylinder; excellent order; very low. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator.
C. SIEDLER, Pres.
9 tf d 156 Fifth Ave., New York, N. Y.

FOR SALE.

One extra heavy Quaker machine in good order.

One, horse power machine which we will guarantee good as new, was used to test clay, making about 100,000 brick.

HORTON M'F'G. CO.,
11 tf d Painesville, Ohio.

Anglo-American Pottery.

Old English China with American Views.

A MANUAL FOR COLLECTORS, BY

DR. EDWIN ATLEE BARBER, A. M., Ph. D.

Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc.

The book consists of about 170 pages, illustrated with 93 half-tone engravings of old plates and pitchers bearing American designs, produced by English potters between 1815 and 1840, and sketches of each English Potter. Over 500 different designs, in dark blue and other antique china are listed. The work will prove of great interest to all lovers of old crockery in America and England and will be especially valuable to collectors.

The price is $1.60 per copy, postage prepaid.

T. A. RANDALL & CO.,
The Clay-Worker.
INDIANAPOLIS, IND.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

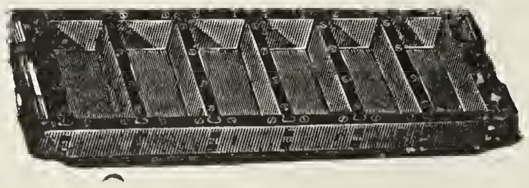
Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

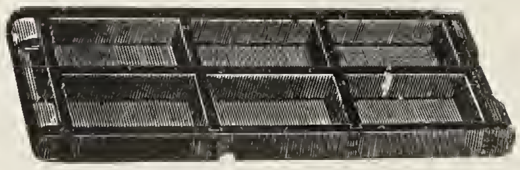
E. M. PIKE,

CAPT. G. H. ETTLA, Agt.
Marietta, Pa. } Chenoa, Ill.

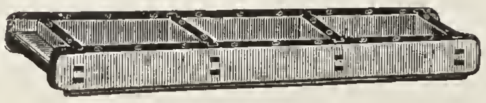
1899--BRICKYARD SUPPLIES--1899



6 Brick Machine Mold.



6 Brick Hand Mold



3 Brick Hand Mold.

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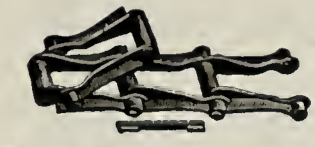

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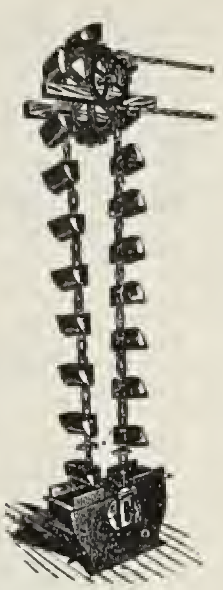

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

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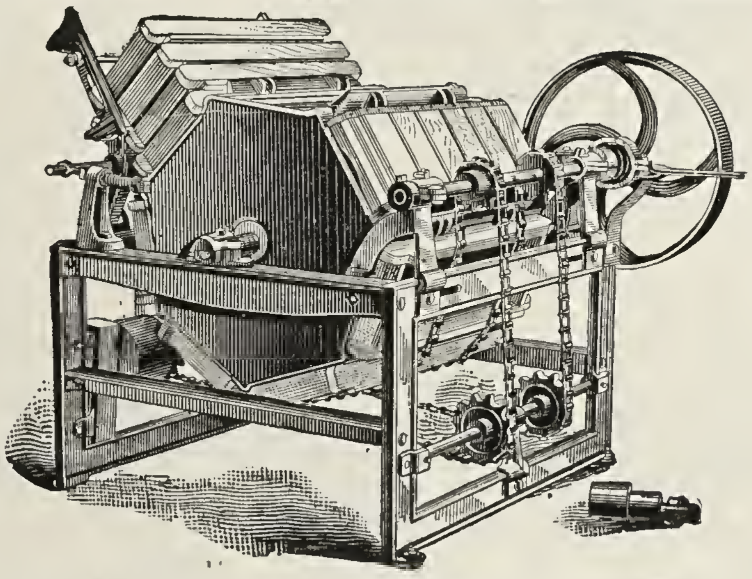

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The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been sucessful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

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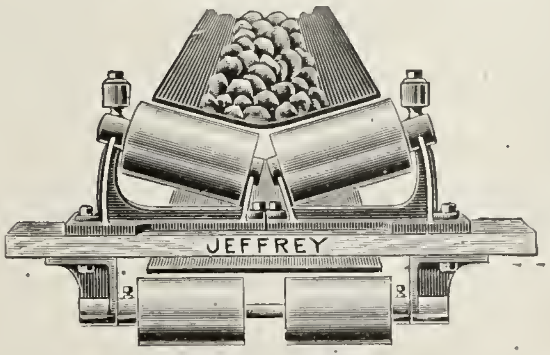

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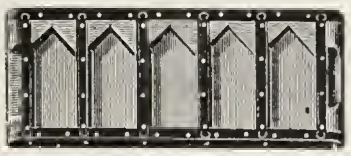

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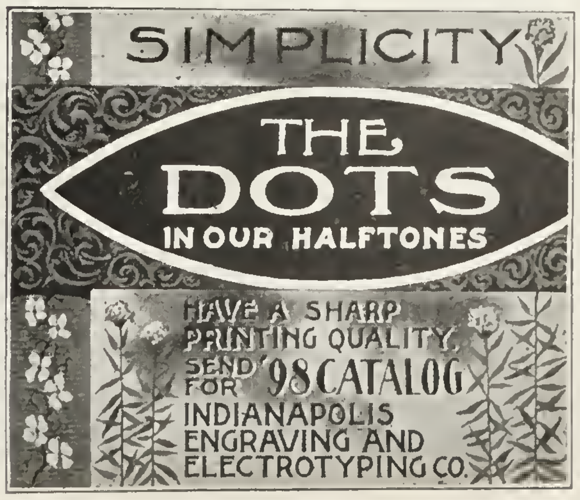

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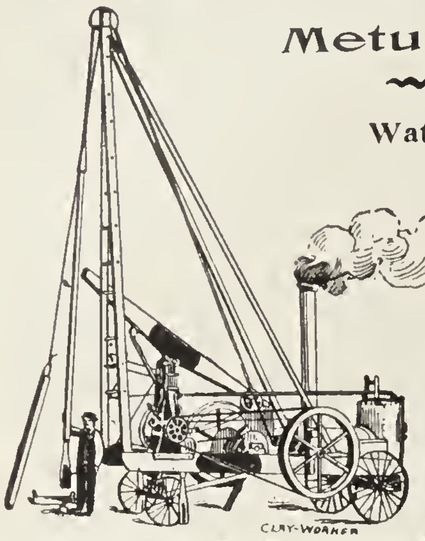

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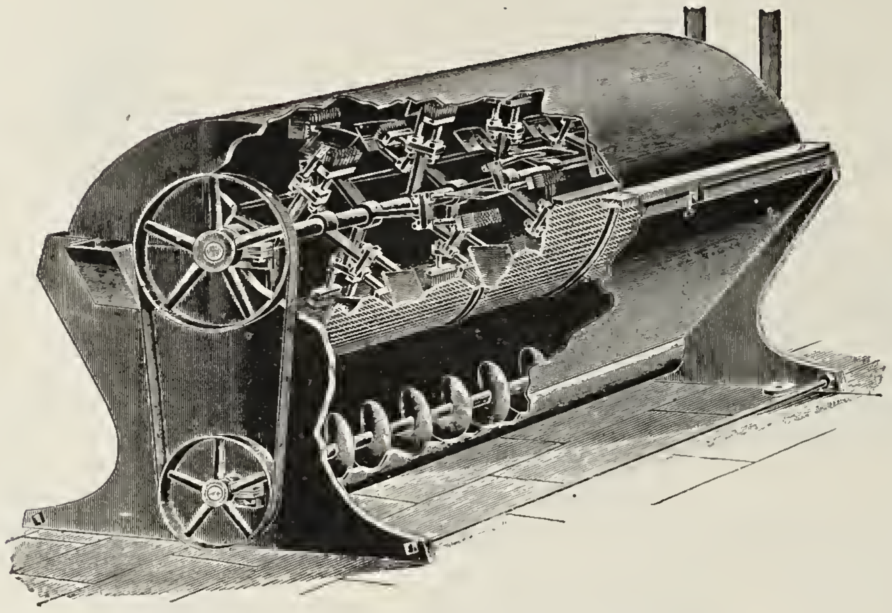

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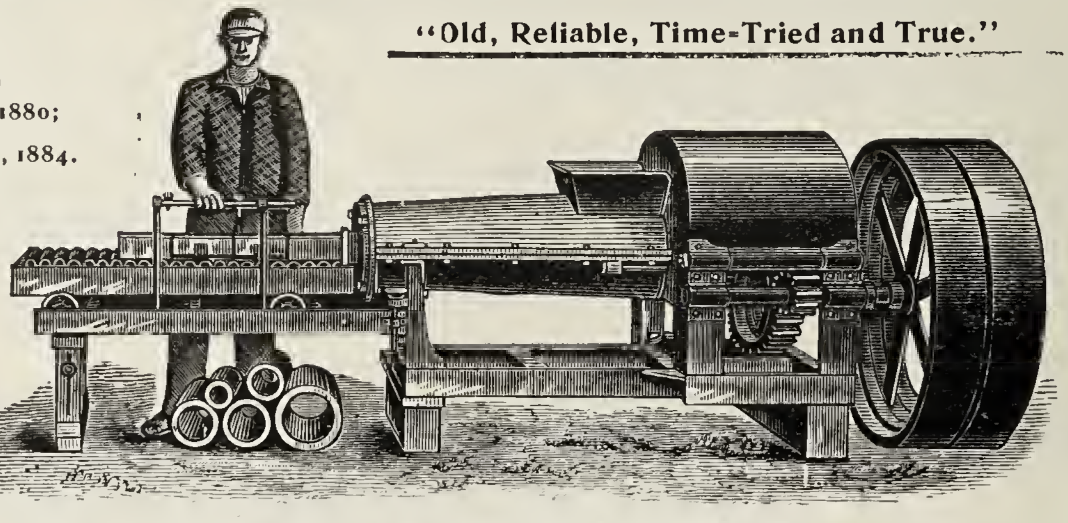

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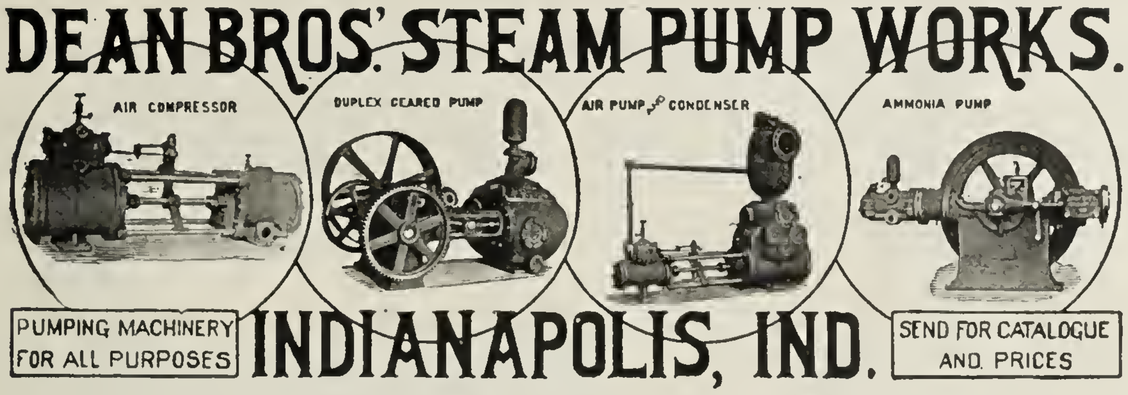

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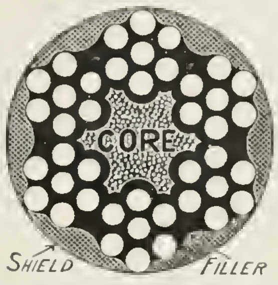

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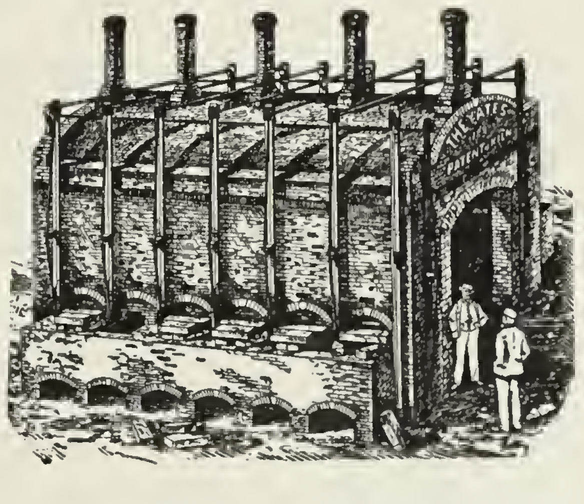

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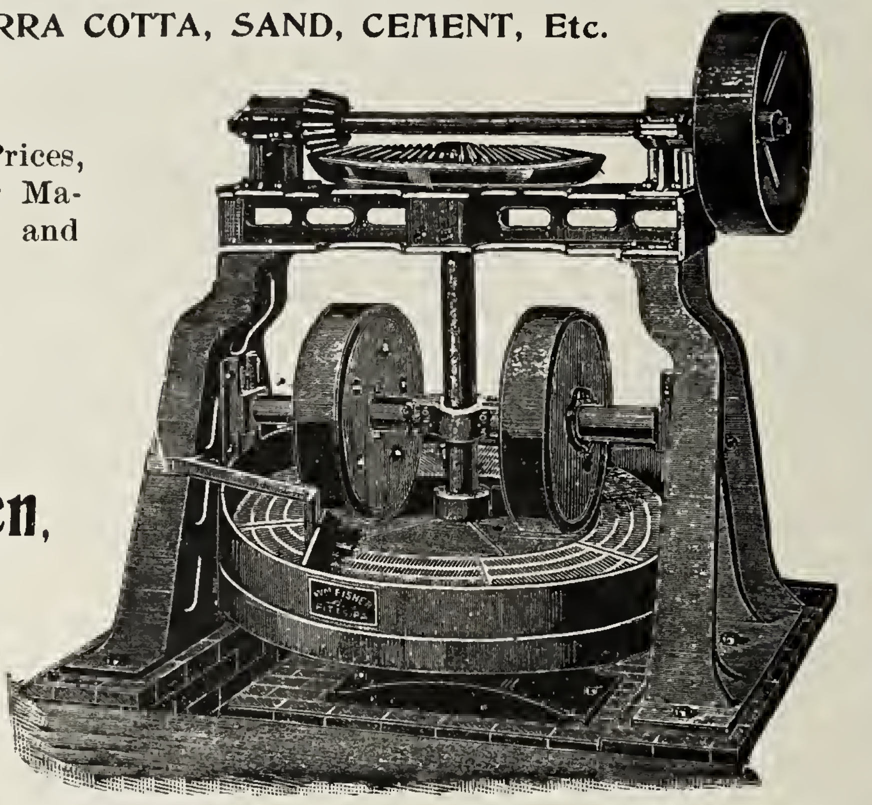

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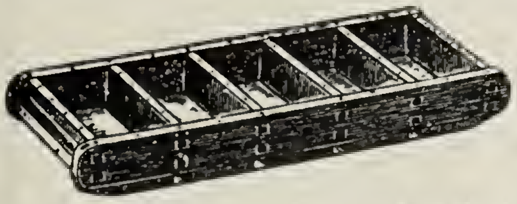

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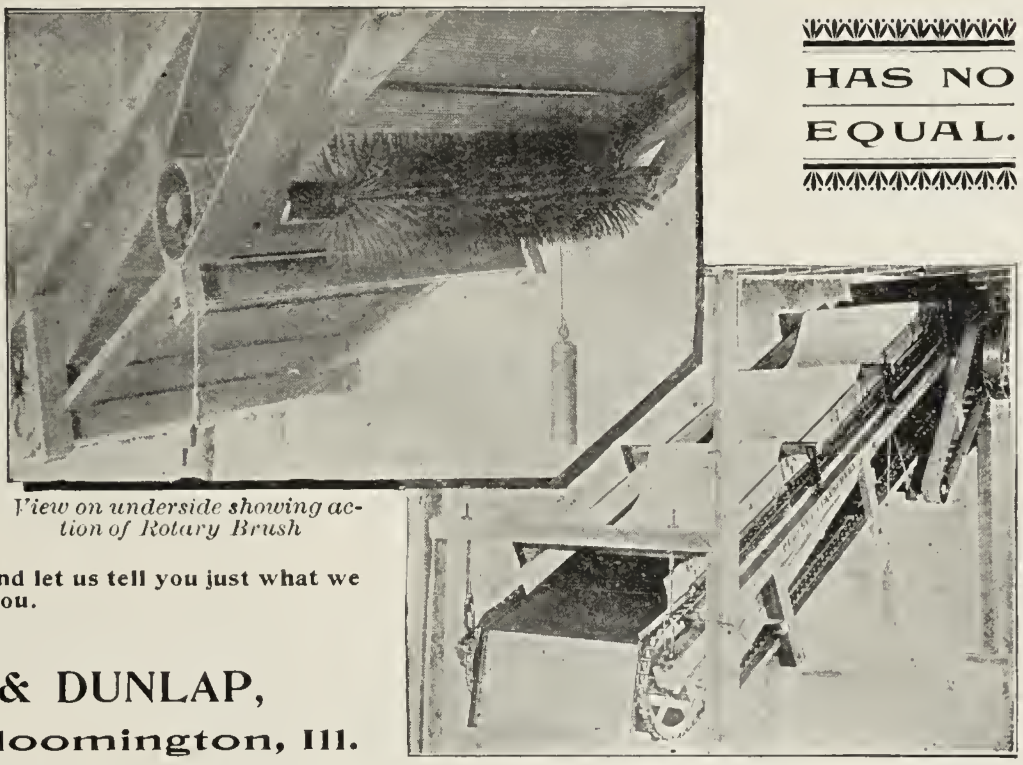

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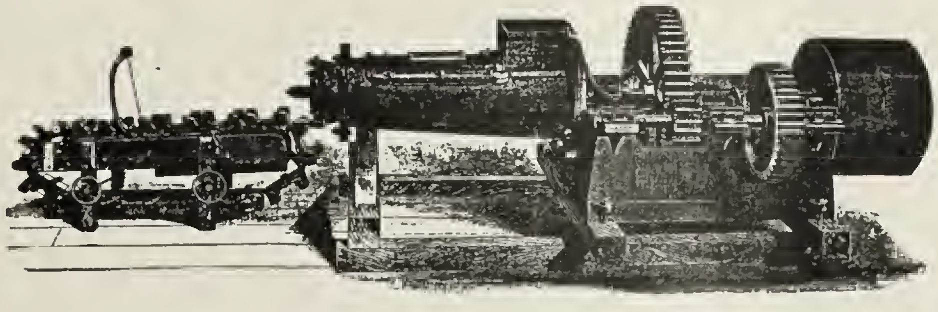

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Samples sent free on application.

Write for prices.

9 Outfits in One Month. Why?

They are { BUILT RIGHT,
SOLD RIGHT.

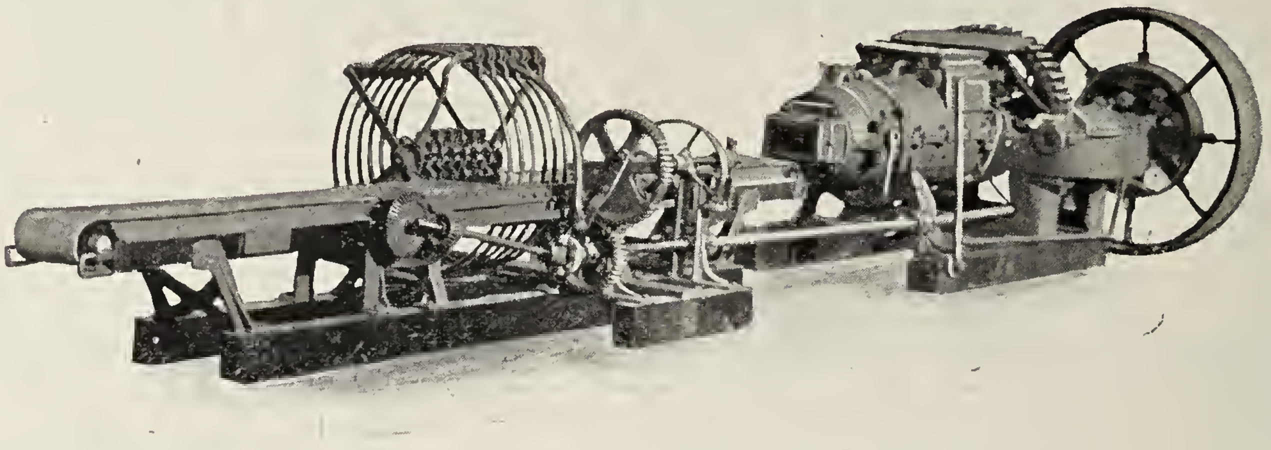
Pendleton, S. C., April 19, '99.

GENTS:

The Automatic Side Cut Table is the finest thing of the kind I have ever seen.

J. C. STRIBLING.

END OR SIDE CUT BY CHANGING REEL FRAME.



X-tra and Automatic Side Cutter.

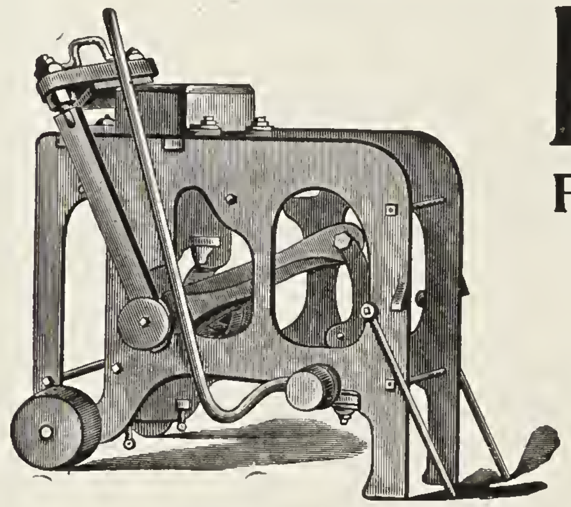
J. C. STEELE & SONS, Manufacturers of The "NEW SOUTH" BRICK MACHINERY, **Statesville, N. C.**

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.

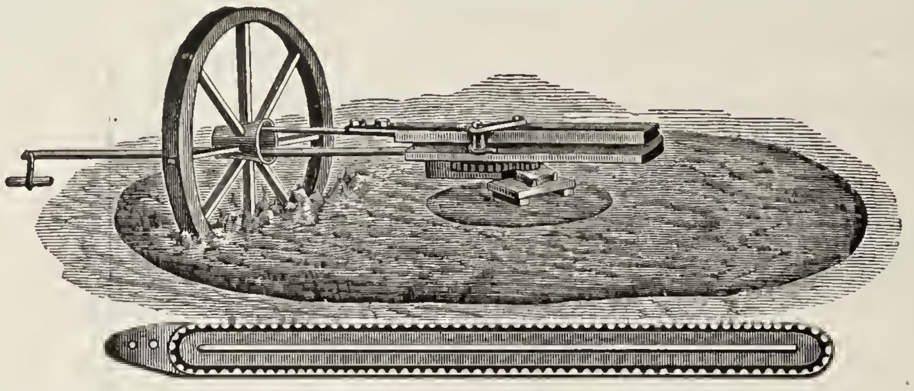


RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

☞ Send for Circular and Price-List.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

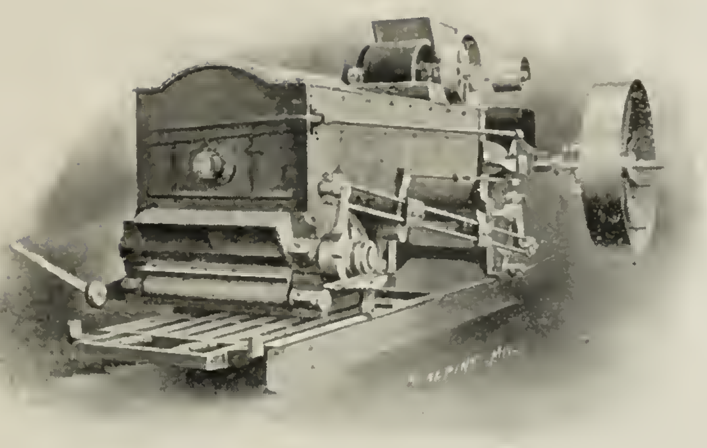
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

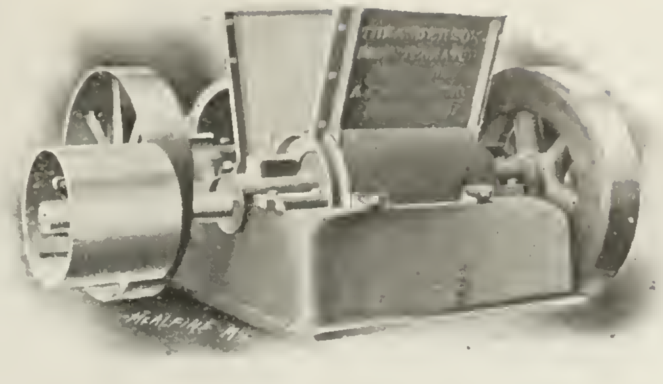
[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.



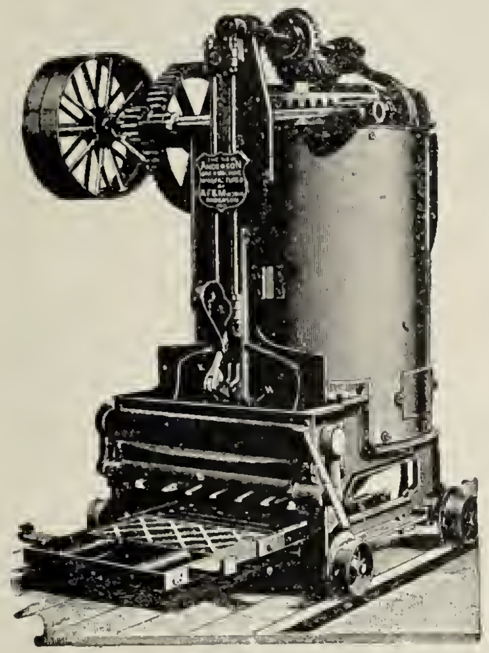
Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



Best Disintegrator on the Market.



Steel and Iron Upright Stock Brick Machine.

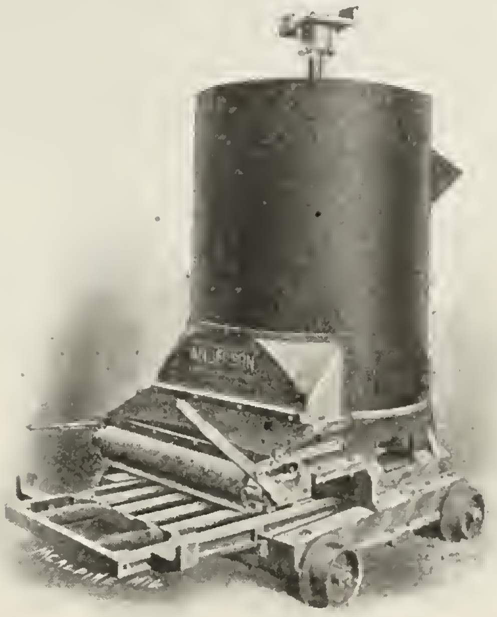
MANUFACTURERS OF . . . .

New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,

And all Brickyard Supplies.



1899 Horse Power Machine.

The Anderson Foundry and Machine Works,
Anderson, Ind.

CLIPPER BEVEL GEARED BUSINESS BICYCLES

Diamond Cranks

and Tool Steel Cones

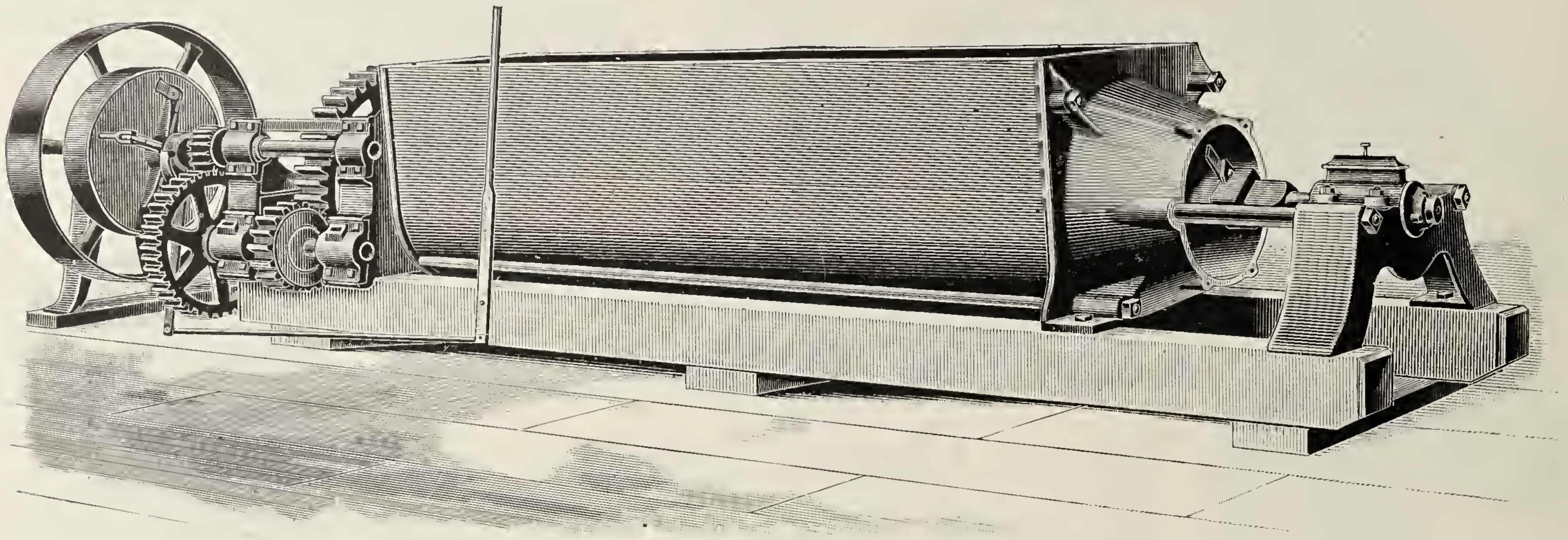
Are two very important parts in all Clipper Bicycles. The Clipper was the first bicycle fitted with a diamond-shaped crank. As soon as it appeared, it was copied right and left by nearly all makers. Not one equals the original.

Tool Steel Cones are the thing. They wear longer, and consequently have less friction than any other kind.

If you haven't our special introductory price on Clipper **Chainless**, write us. If we're not represented, we'll sell you a bicycle direct and take care of you.

GRAND RAPIDS CYCLE CO., "Clipper People," MICH.

A GOOD THING.



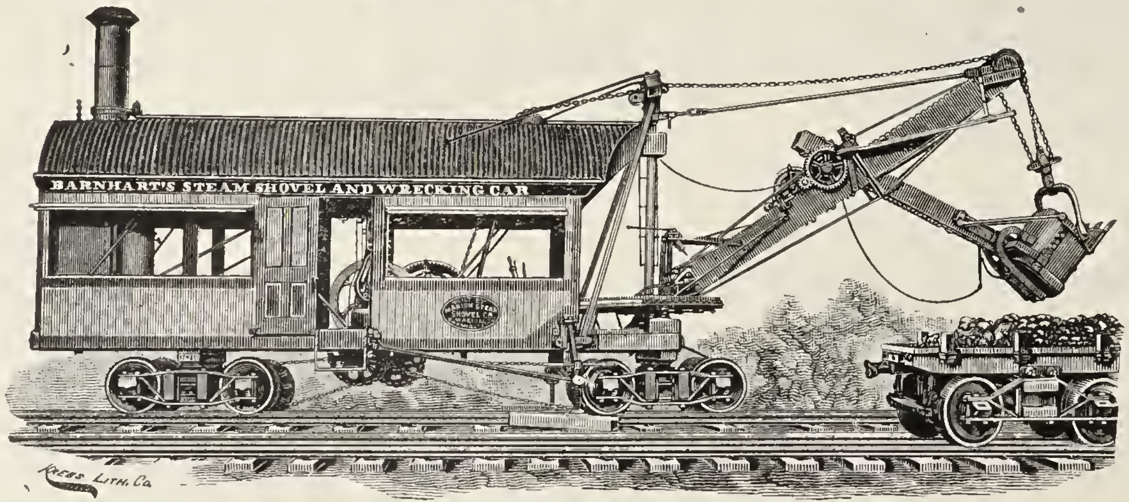
Leader Pug Mill, Size No. 9.

Send for circulars of our **Leader Machinery.**

Brick Machines, Pug Mills, Crushers, Disintegrators, Automatic Cutters, Etc., Etc.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.


BARNHART'S STEAM SHOVEL AND WRECKING CAR
Krebs Lith. Co.

STYLE A—1½ YD.

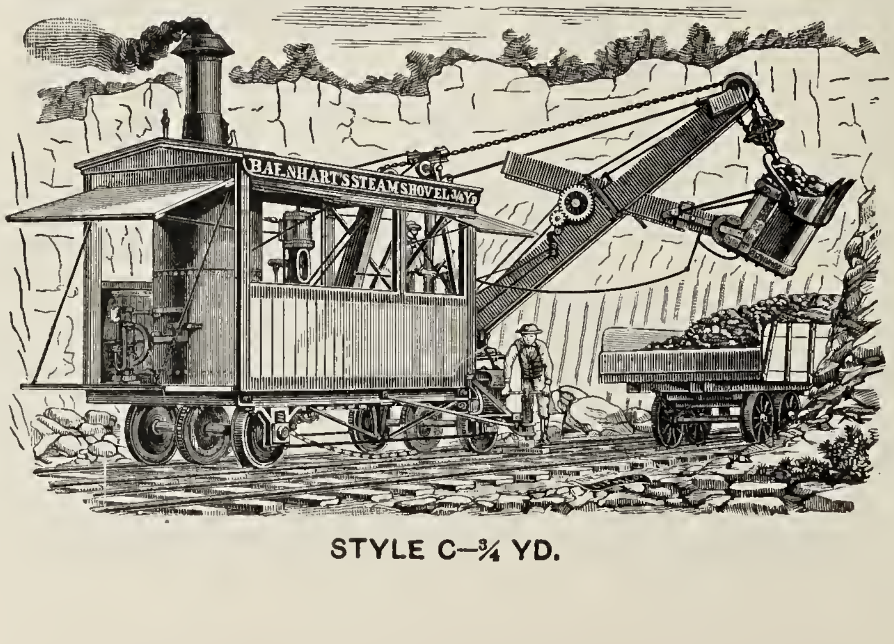
Our large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**



STYLE C—¾ YD.

If You Want the BEST

Dryer Cars

At a **very reasonable price** give us an opportunity to show you our new designs. We have used them in the **Brick Business** and have overcome the **weak points.**

CLEVELAND CAR CO.,
150 Scranton Ave., CLEVELAND, OHIO.

Mention the Clay-Worker

Have You Ever Considered This?

That a Very Small Quantity of

Dixon's Ticonderoga FLAKE GRAPHITE.

Say 5 to 10 per cent. added to the grease or oil that you are now using, will make you oil or grease do three to six times as much work and do it much better.

This has been fully demonstrated but if you want to prove it for yourself we will send you samples free of charge and a pamphlet giving full particulars.

JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

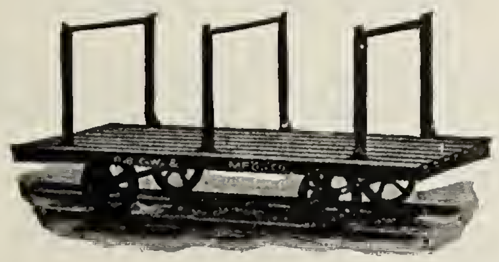
The Atlas Bolt & Screw Co.,

Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

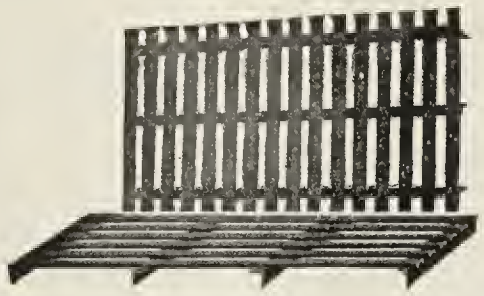
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

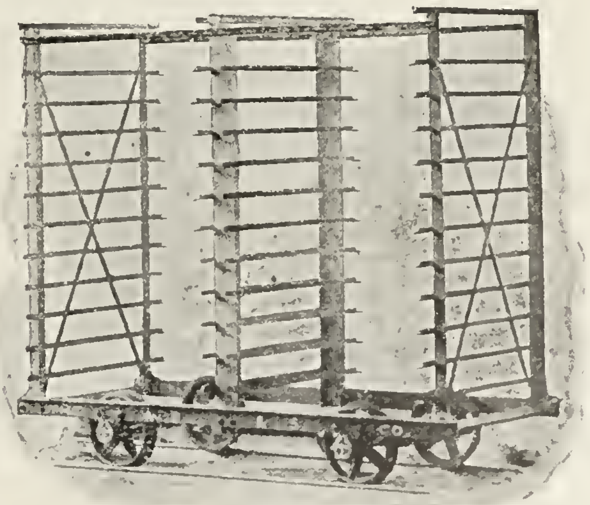
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

Horseheads Brick Co., N. Y., August 13, 1898.

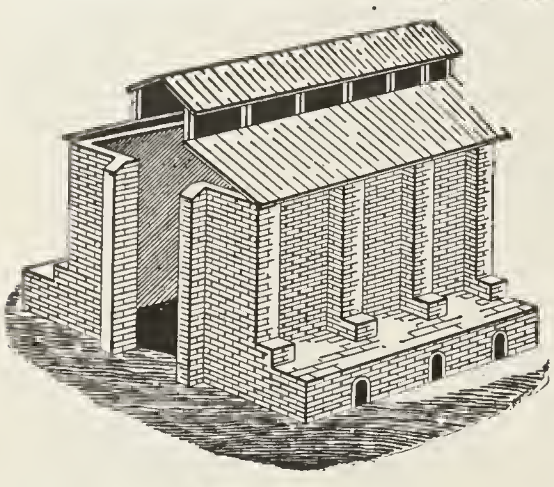
Mr. H. HAIGH, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success. In fact we have been able to do much more than you had guaranteed the kiln would do. We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours, R. G. EISENHART, Treas. and Gen. Man.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

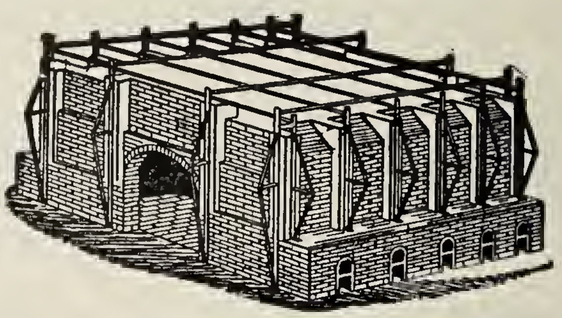


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL,* 2,422 Chestnut St., *Kansas City, Mo.

MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,

P. O. Box 335. ***ROME, GA., U. S. A.***

The Mitchell One Door Coking Furnace IS NO EXPERIMENT.

The Mitchell Slack Coal and Coking Furnace

Can be attached to any style of Kiln.

Guaranteed to be the cheapest and most economical furnace on the market to Construct and operate.

It positively excludes all cold air from coming in contact with your ware.

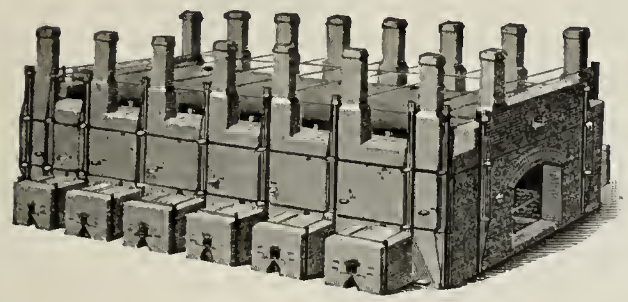
It requires nothing but the cheapest grade of slack from start to finish of burn.

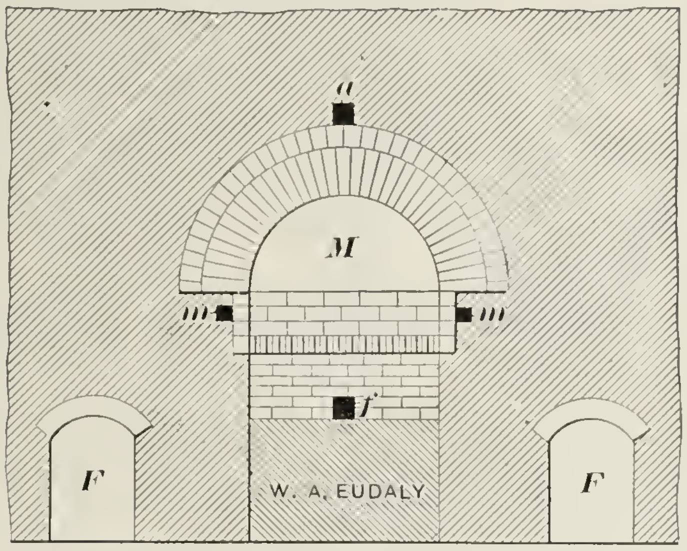
For further particulars testimonials address

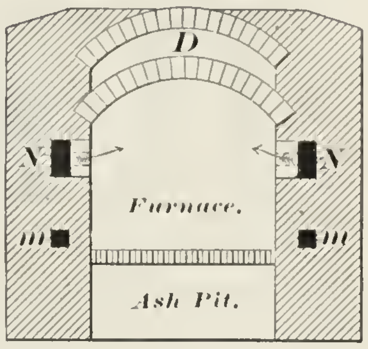
W. C. MITCHELL, Oelwein, Iowa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.







These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

Portable Continuous Kiln and Drying Floors.

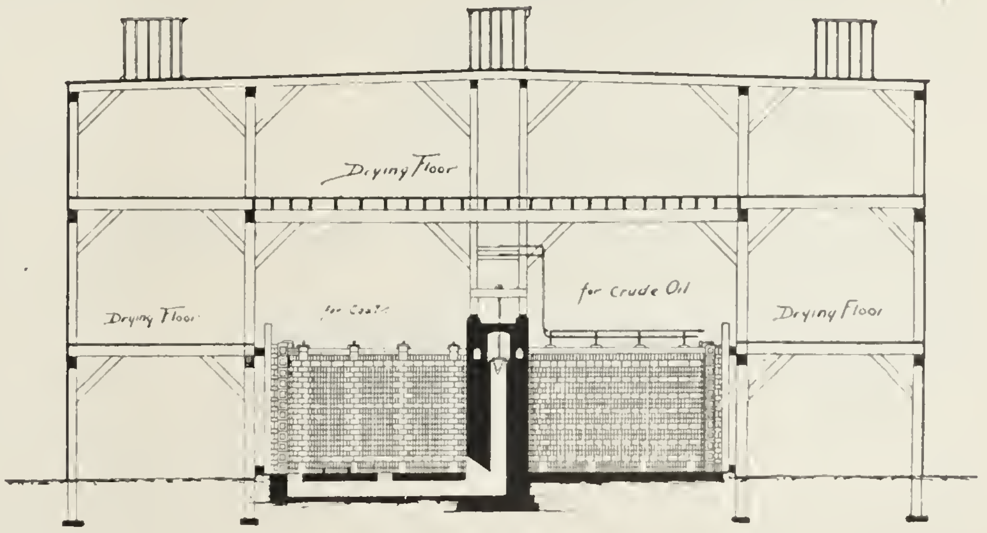
(Lehmann's Patent.)

By this system the cost of drying and burning is much less than by old methods and the green ware is handled by mechanical appliances that insure safe, rapid and cheap work. This system now in successful operation at Chicago and other points. Adapted to the use of any fuel, coal, oil or gas. If you want to reduce your fuel bills and improve quality of your ware write for full particulars.

F. LEHMANN & CO.,

Foot of West Wellington Street,
CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers, Plans and estimates furnished for Brick, Lime and Cement Works. Practical tests made.

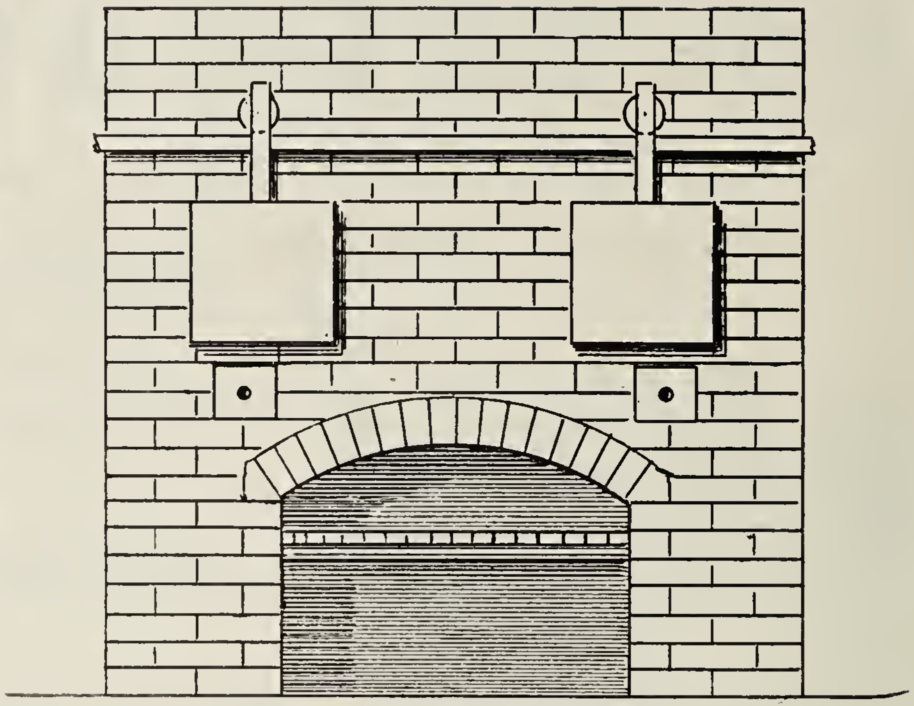


The Lehmann Slumming Apparatus Is the most economical method of washing clays yet devised. It is simple and effective. By it all objectionable materials may be easily removed from common clay, kaolin, chalk, cement, mineral paints, etc. Full particulars for the asking.

The GRATH

Gas Producing,
Consuming and Coking

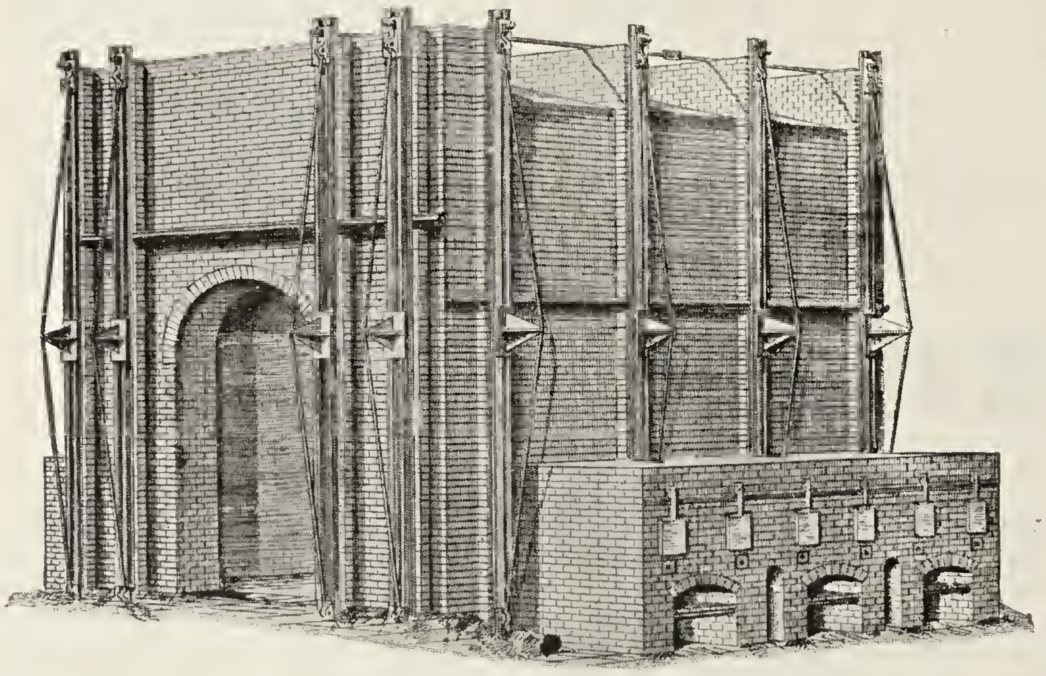
FURNACE.



PATENTED—Front of Furnace for Down-Draft Kiln.

Is the **ONLY** furnace getting the benefit of the heat both from below the fuel as well as above, which converts the slack into **red** hot coke. We will protect all users of our furnace and will place the Coking Table on sides or center of furnace as desired. With one ton **Slack** you produce the same result as with same amount of lump coal in ordinary furnace.

◆



PATENTED.

The GRATH
DOWN-DRAFT
KILN,

With Coking Furnace attached will burn the largest amount of Face, Vitrified or Fire Brick. We guarantee from 90 to 98 per cent. first quality brick. No soft or salmon brick in kiln. Built any size wanted.

◆

The Grath Hand Power Ornamental Brick Press.

Simplest, most Powerful and Durable on the market and only Hand Press giving as much pressure as a power machine.

◆

The Grath Brick Grinding Machine

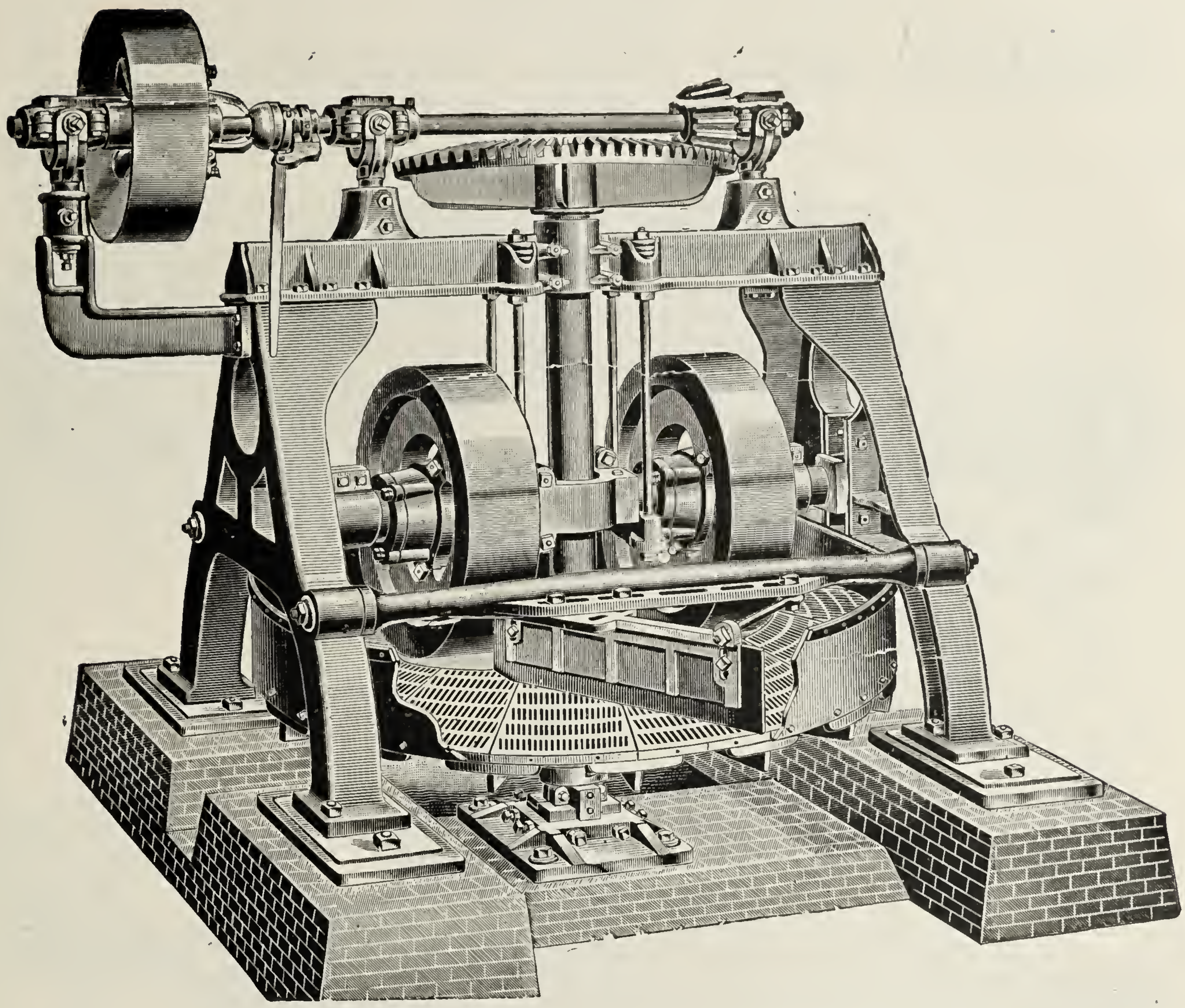
for grinding arch and radius. Will grind brick of any hardness even if vitrified. Simplest and cheapest in the market.

◆

FOR FURTHER PARTICULARS, ADDRESS

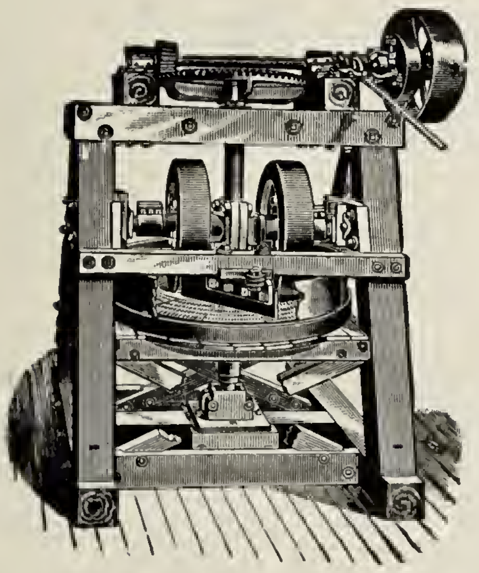
The ILLINOIS SUPPLY & CONSTRUCTION CO.,

St. Louis, Mo.



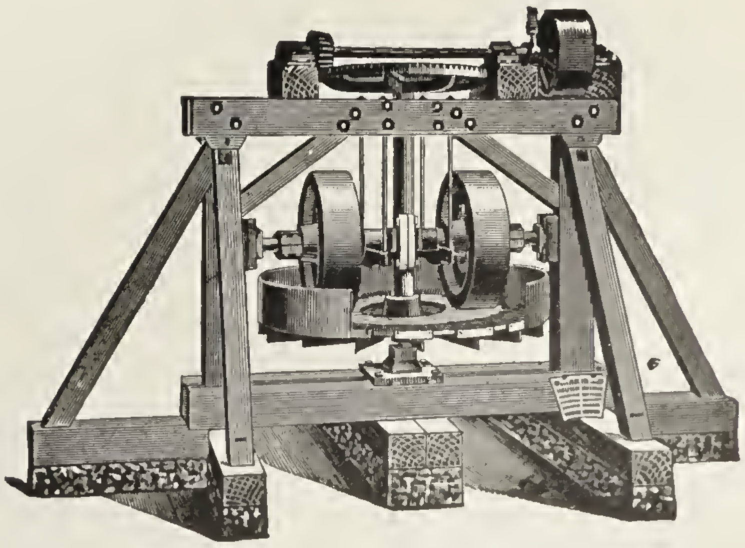
OUR SPECIALTY IS

DRY PANS.



IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



......SEND FOR NEW ILLUSTRATED CATALOGUE......

FROST ENGINE CO.,

Galesburg, Ill.,
U. S. A.

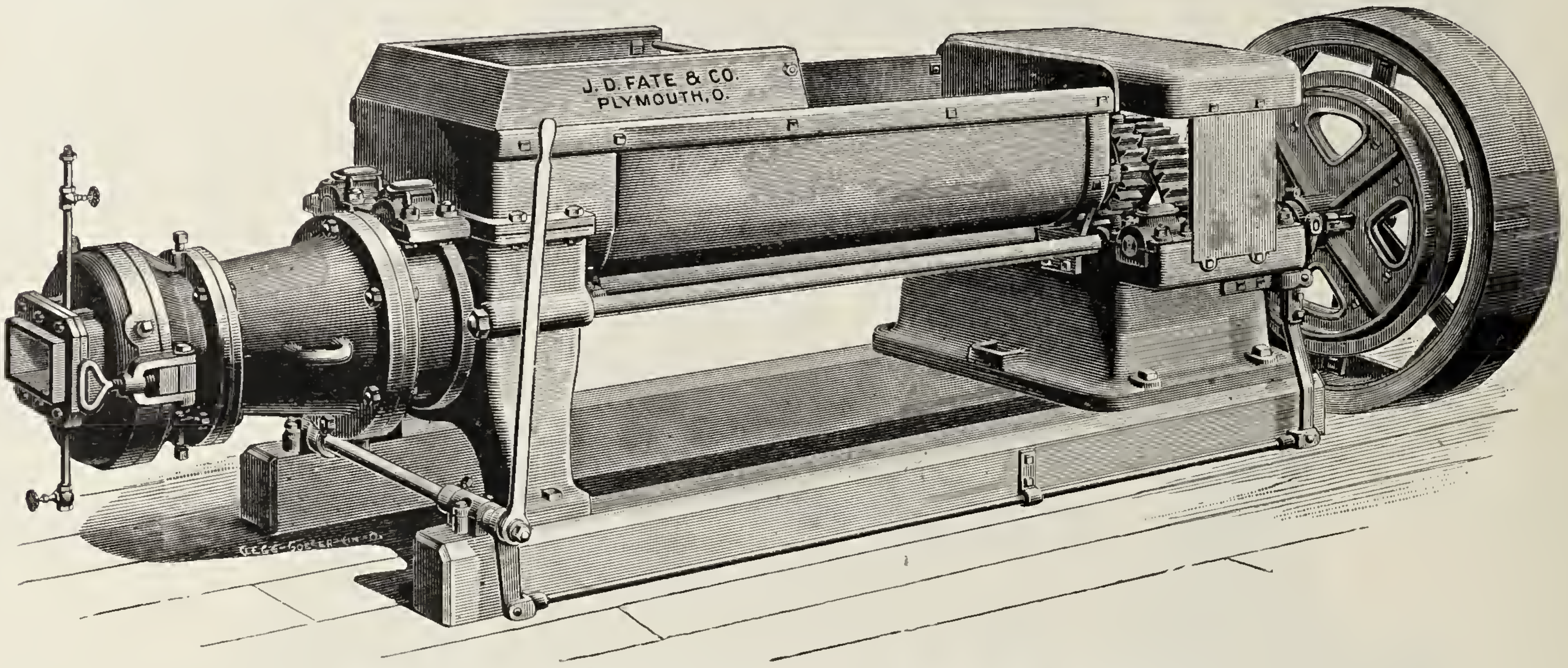
J. D. FATE & CO.,

Manufacturers of

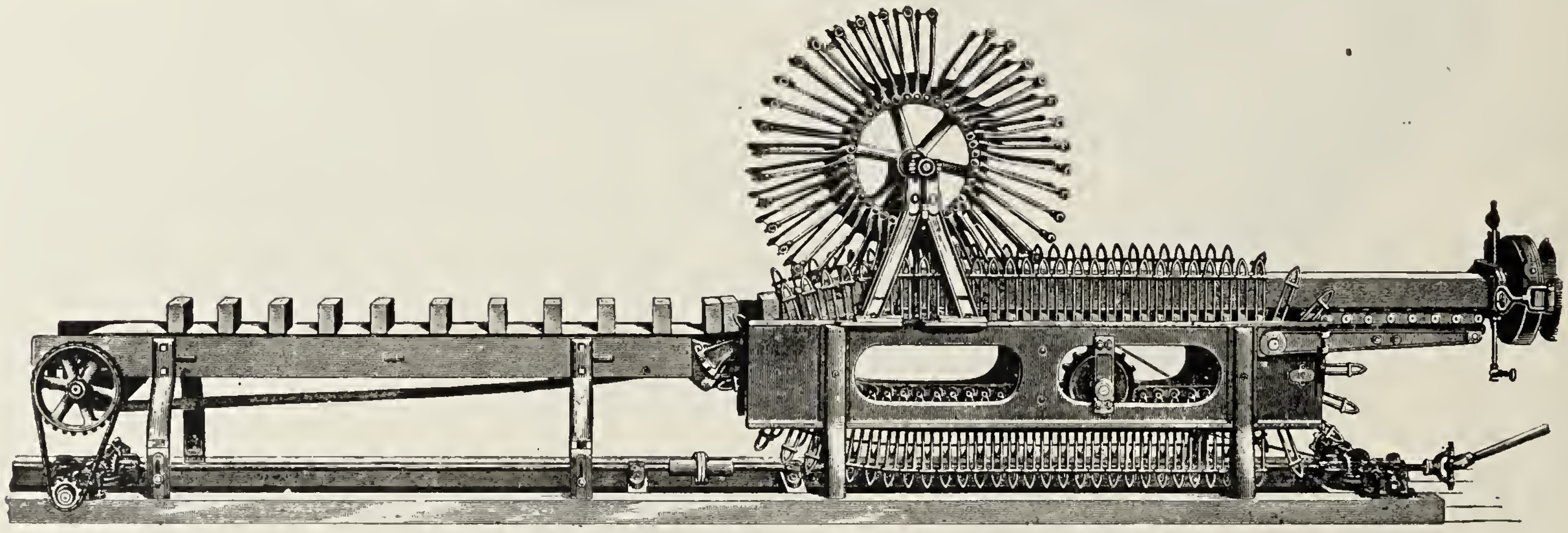
BRICK AND TILE MACHINERY.

PLYMOUTH, OHIO.

Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.


J. D. FATE & CO.
PLYMOUTH, O.

"HUMMER" COMBINED PUG MILL AND BRICK MACHINE.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.

Des Moines, Iowa, May 11th, 1899.

J. D. FATE & CO., Plymouth, Ohio.

Gentlemen:—We are so well pleased with the Automatic Side-cut Brick Machine that we purchased from you this Spring that we feel it our duty to send you a testimonial. We feel safe when we say it has no equal, but we are sure when we say it has no superior, because it is perfect when it comes to making a nice, square brick. We have tried it in all kinds of clay that we have here, and it makes no difference, it runs just the same. We can now make a fancy face brick, which we could not do before. We do not use power to drive the wheel—the column of clay runs it nicely. We feel that it is the best investment we ever made. If you have any prospective customer in our neighborhood, send him to our yard to see the machine, and we will venture to say he will buy your machine.

Very respectfully yours, NEWMAN BRICK & COAL CO.

Correct in principle and mechanism.

Simplicity itself—nothing can get out of order unless broken by carelessness.

Strong and of long life—all its motions being continuously rotary.

The parts work together without jarring.

There is no halt or hesitation—every motion is prompt and positive.

Requires no expert to keep it running or in repair.

The column of clay, assisted by friction, runs the table, but all movements are regulated by clay column. When the column goes, table moves, and stops when it stops.

Breaks less than one-tenth the cutting wires that others do, and if wires are broken may be easily replaced without stopping.

The brick cut are square and true, with sharp edges and corners, and equal to the finest Press Brick.

The first brick is as good as the last, and the last as the first.

Cutting capacity practically unlimited.

"Soft Mud" Brick Machinery, both Steam and Horse Power in addition to our full line of "Stiff Mud" Machinery.

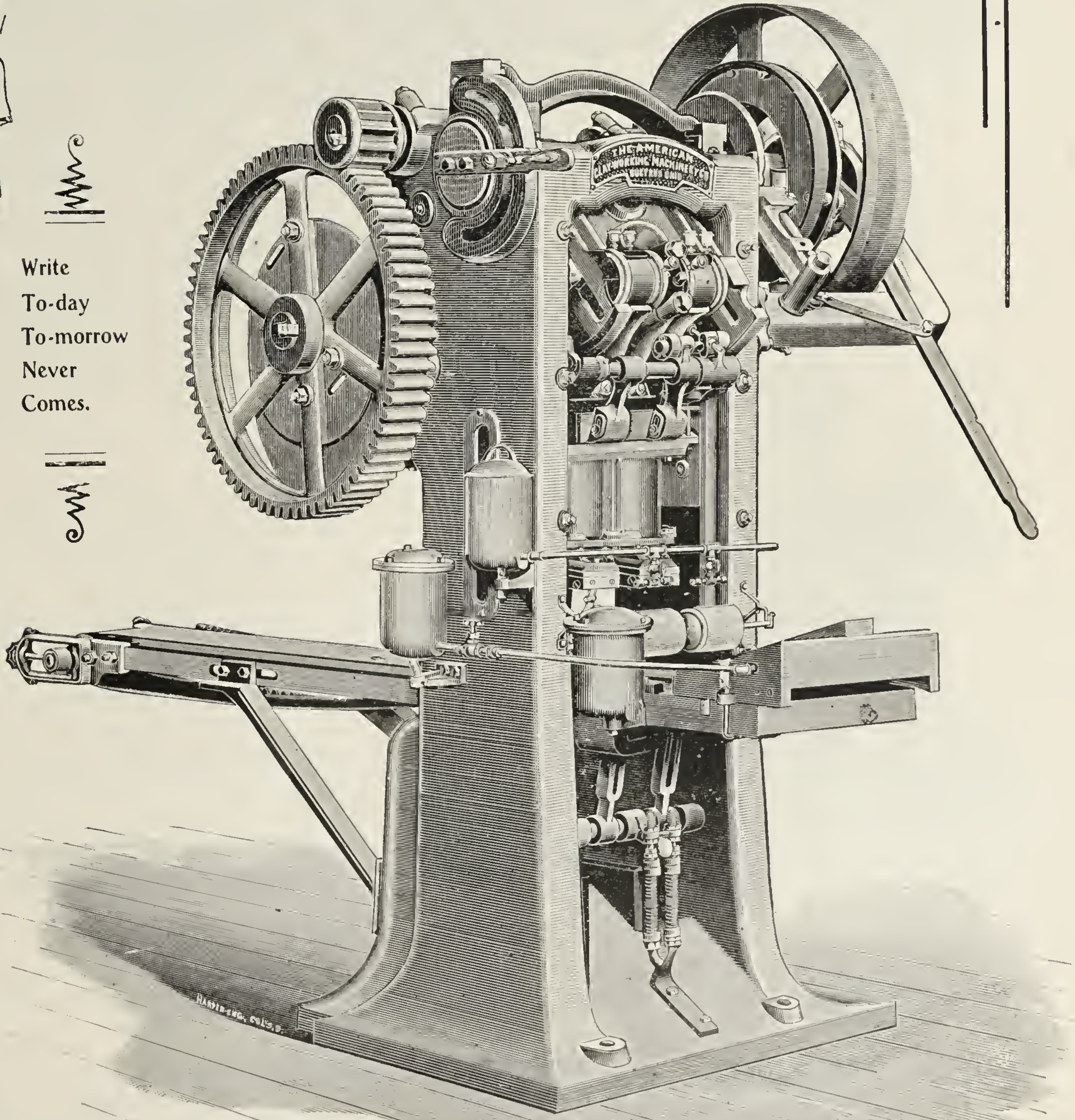
ASK FOR CATALOGUE AND PRICES.

HOLD UP!

IT WILL BE MONEY in your pocket if you hold up your purchase of clay-working machinery until you have examined thoroughly into the merits of The American Line. There are points about our machines that will interest you. They insure a saving of power, a saving of time, a saving of money, and an increased quantity and quality of product. What more could you ask? Isn't a machine that will do more and do it better in a given time and with less trouble and expense the machine you want if you are in business to make money?

We manufacture a complete line of clay-working machinery of all capacities—every one a guaranteed success. If you're thinking of improvements we can assist you. If you're figuring on improvements, we can save you money. If you're sure you're going to improve, we make your investment a successful one. We guarantee your product by guaranteeing our machines. Write for information.

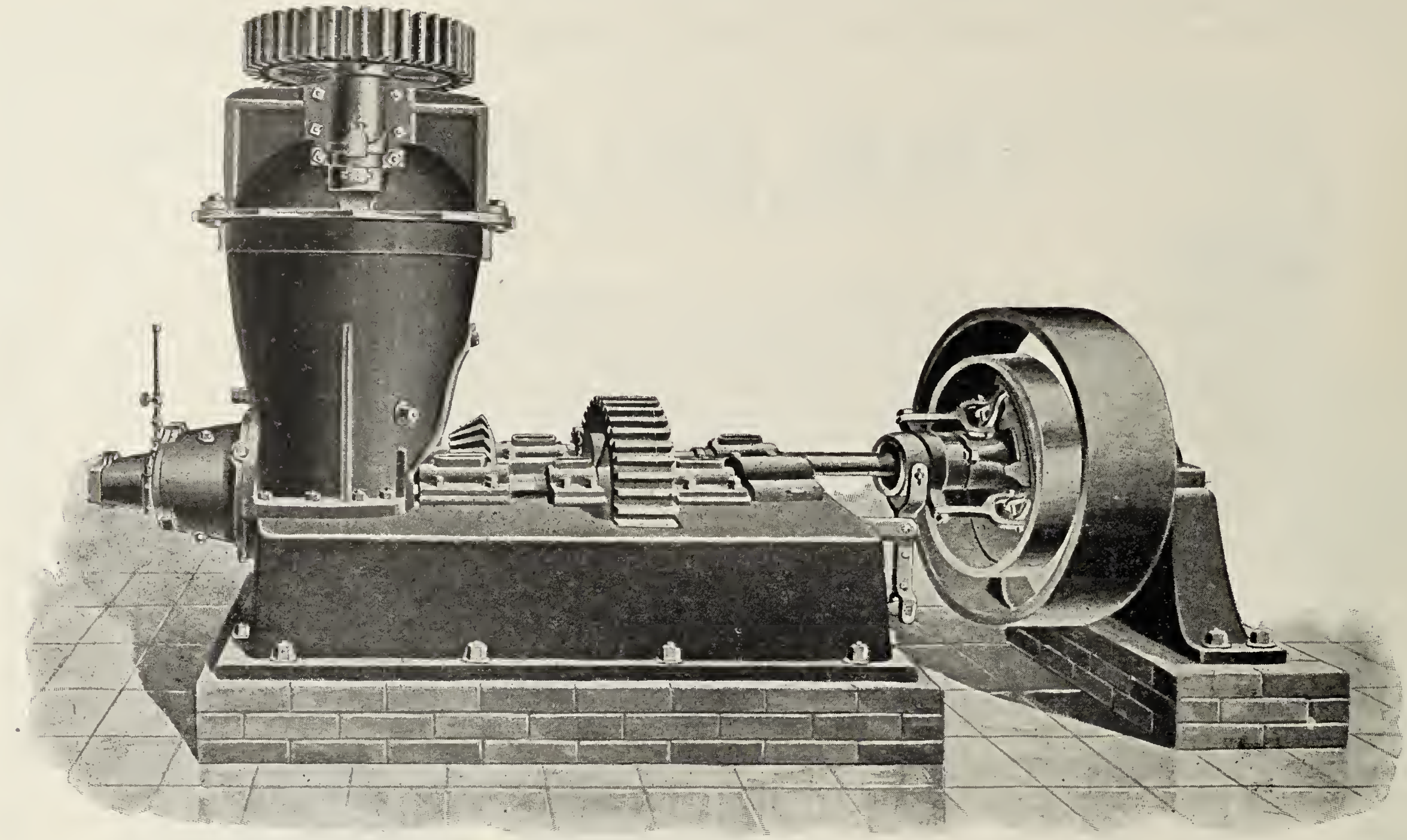
Write
To-day
To-morrow
Never
Comes.


THE AMERICAN CLAY-WORKING MACHINERY CO. BUCYRUS OHIO

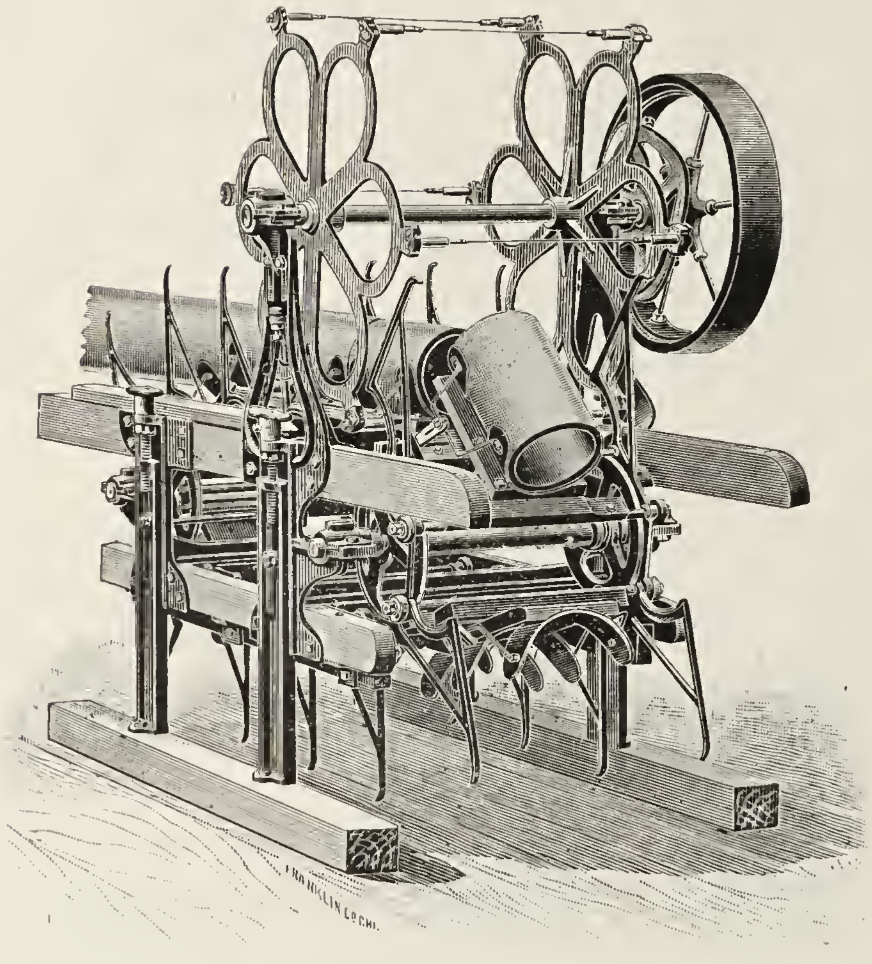
THE MACHINERY THAT NEVER DISAPPOINTS

The American Clay-Working Machinery Company,

Bucyrus,
Ohio, U. S. A.



Brewer No. 10. Daily capacity 50,000 to 80,000 Brick.



Automatic Tile Cutter.

Naperville, Ill., Jan. 24, 1898.

H. BREWER & CO., Tecumseh, Mich.:

Dear Sirs—In answer to your inquiry, it gives us great pleasure to say that your Automatic Tile Cutter we bought about one year ago, along with the No. 9 A machine, is ALL RIGHT, just as you represented it. With it we have been able to put from 15,000 to 18,000 three-inch tile on the floor in 10 hours. The tile are cut true; very few have to be thrown back. There is no doubling up of tile in the troughs when clay runs a little softer than it ought to be; the little belt which drives the reel prevents this and helps to keep the troughs moving. The pressure on the cutting wires being always in the same direction, makes them last a long time. Clay can also be run quite soft and the tile retain their perfect form. We think your Automatic Tile Cutter is nearly perfection. We are well satisfied with it and could not think now of running our works again without it. Wishing you much success, we remain

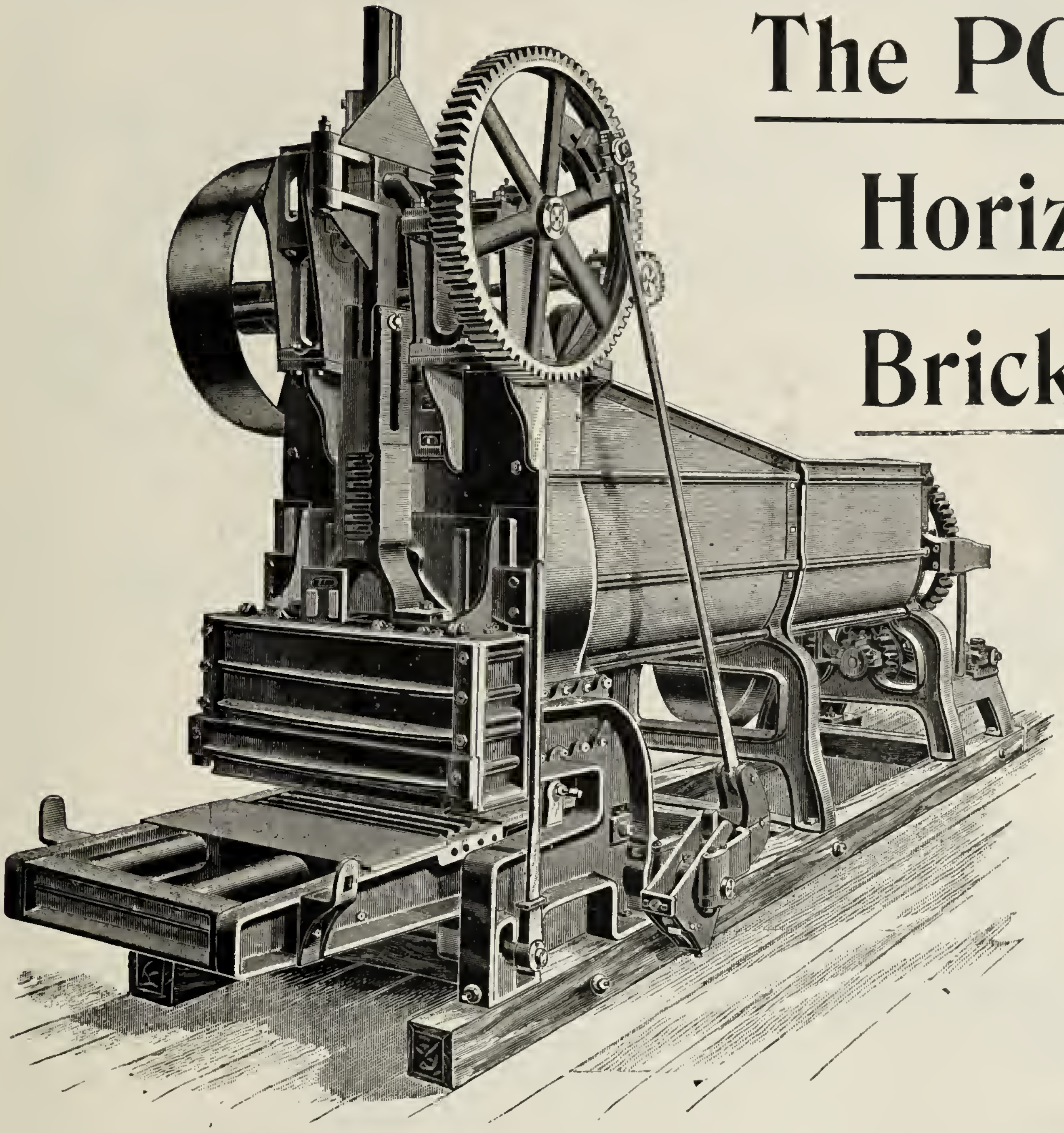
Yours truly,

MARTIN & VONOVEN.

H. BREWER & CO.,

Tecumseh, Mich.

We make a Specialty of erecting Complete Soft Mud Plants.



The POTTS Horizontal Brick Machines,

DISINTEGRATORS

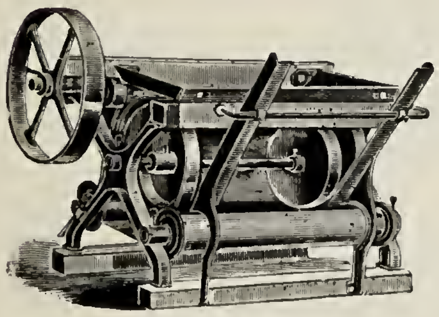
....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

The best built, heaviest and strongest Machinery made.



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WE MANUFACTURE EVERYTHING NEEDED ON THE BRICKYARD.

WE MAKE A SPECIALTY OF BRICK MOULDS.

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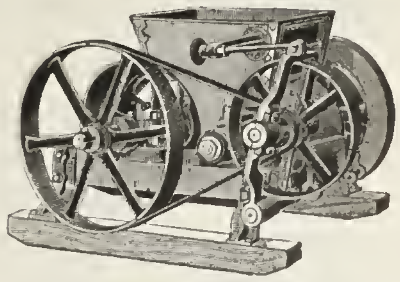

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When in need of Machinery or supplies, we can save you money.

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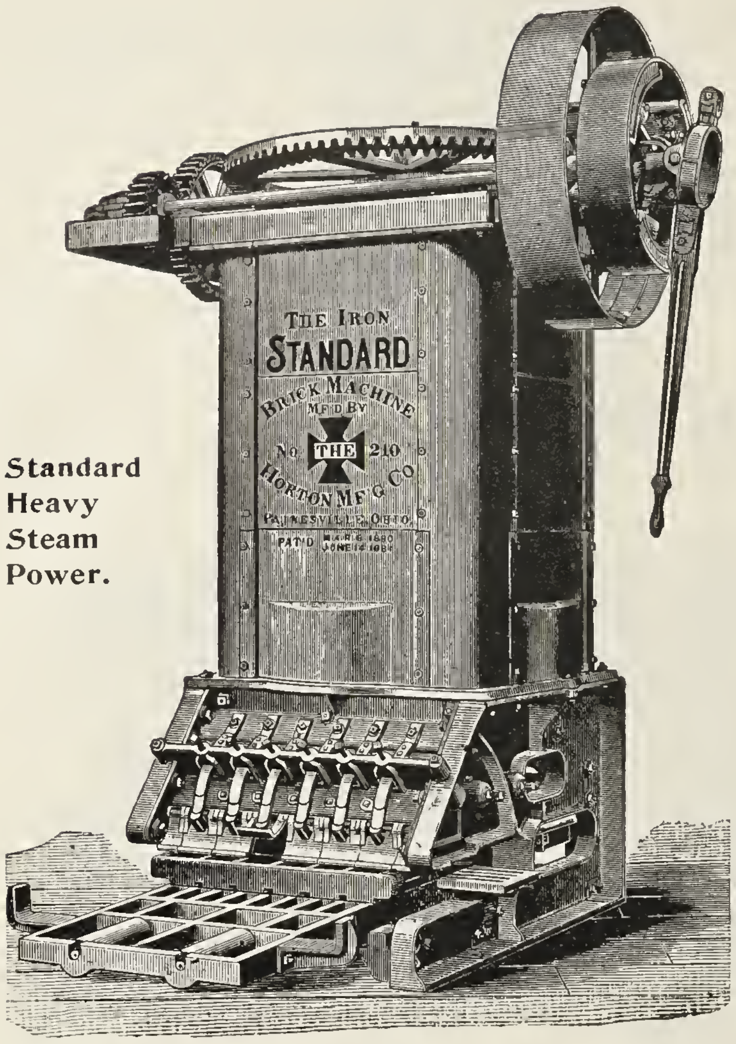

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Heavy
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Power.

The Hercules!

Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

The Standard Machine is just what its name implies.

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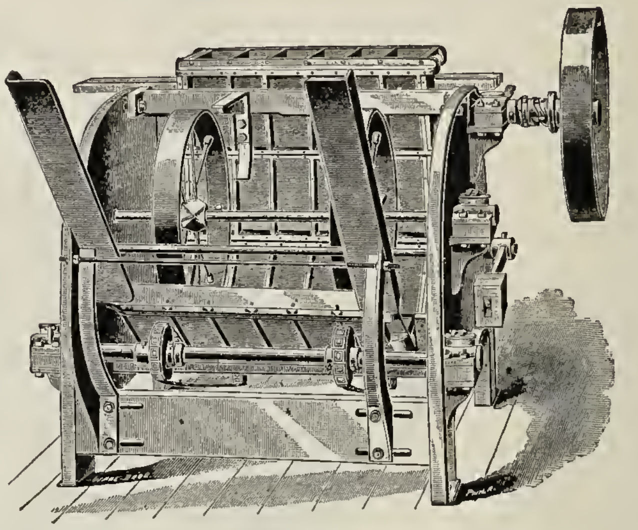
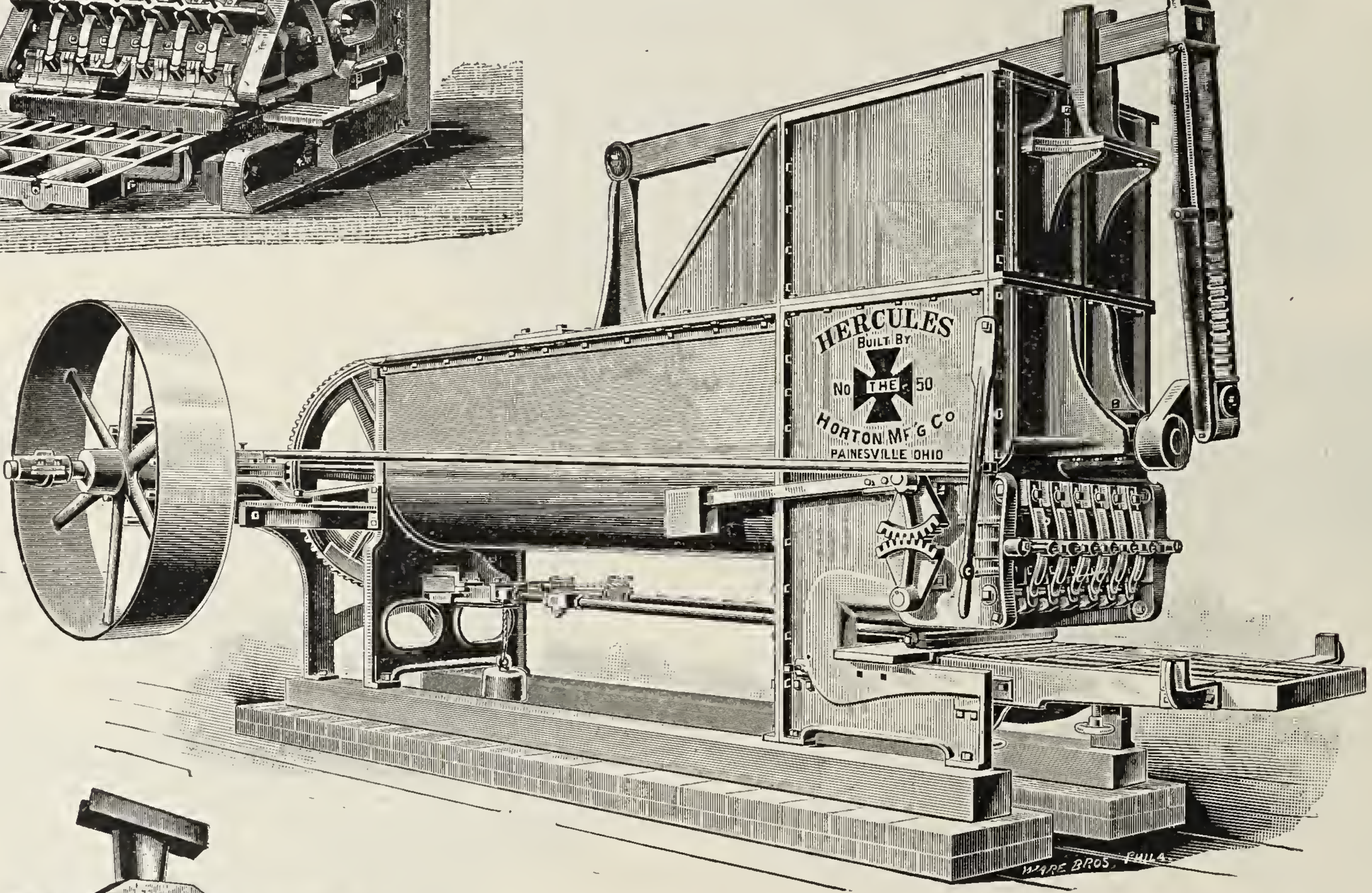
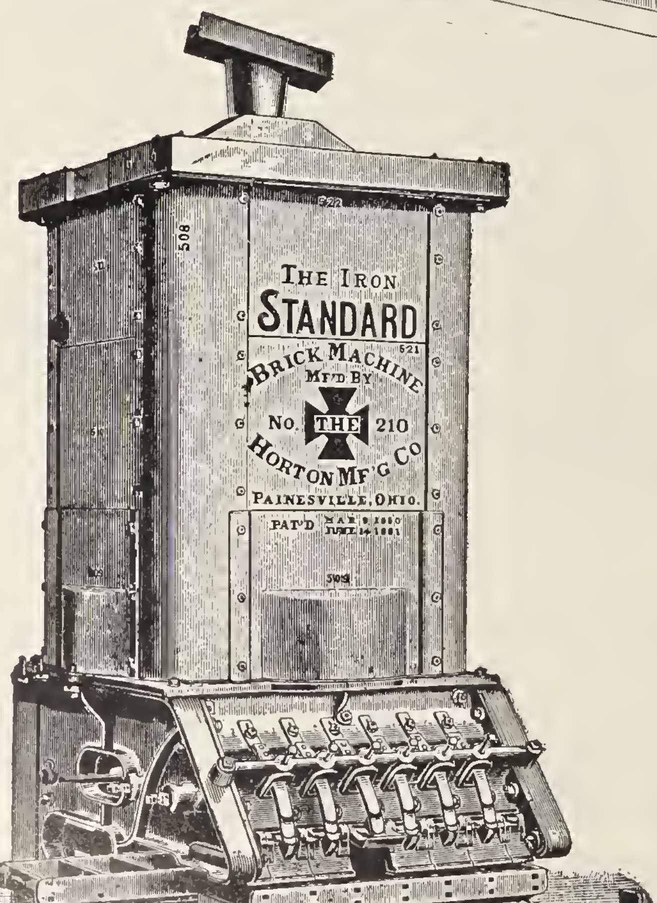


HORTON MOLD SANDER DIRECT FEED.

Hercules capacity 40,000
to 50 000.
Weight 15,000 pounds.



We are making a special drive on Molds this season. Send for our new circular on molds

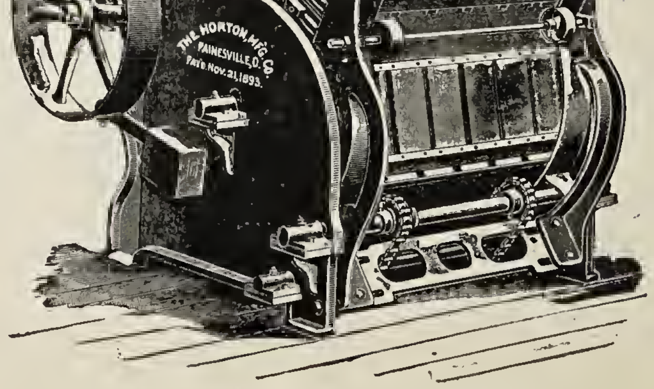


IRON STANDARD HORSE POWER.

WE HAVE recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE,
OHIO.


THE HORTON MF'G. CO.
PAINESVILLE, O.
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THE AUTOMATIC FEED MOLD SANDER.

THE HENRY MARTIN BRICK MACHINE MFG. CO.,

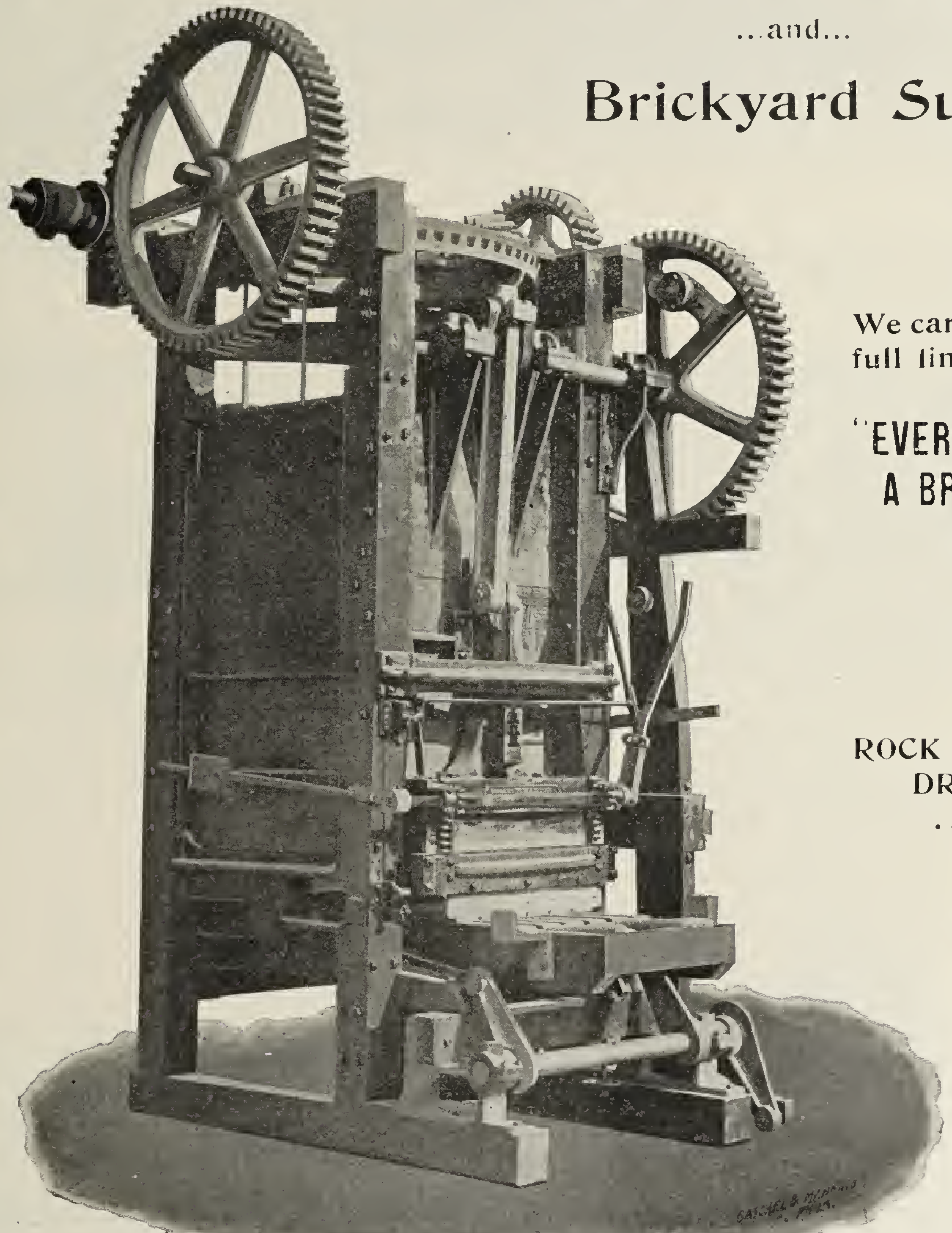
LANCASTER, PA.

Manufacturers and Exporters of the

FAVORITE SOFT MUD BRICK MACHINES

...and...

Brickyard Supplies.



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We carry in Stock a full line of

"EVERYTHING A BRICKMAKER NEEDS."

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ROCK CRUSHERS,
DRY PANS,
...ETC., ETC.

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Brick
Moulds
a Specialty.

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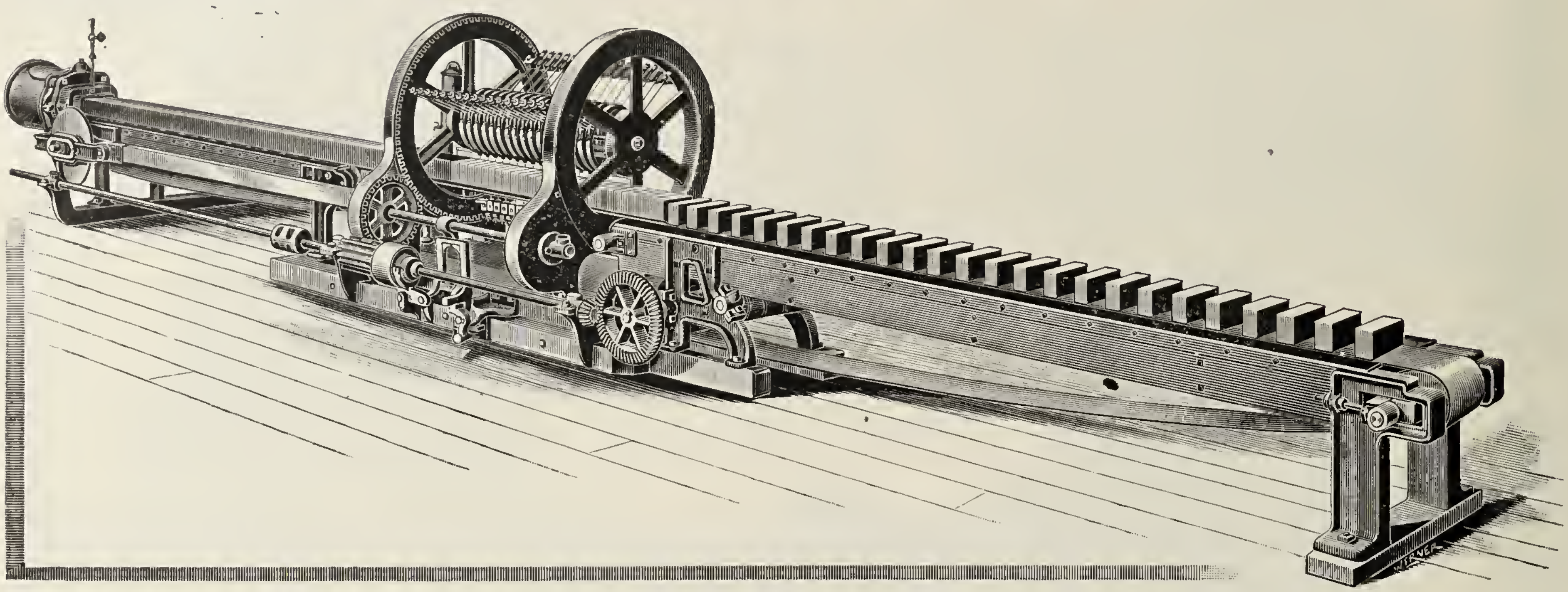
OUR
GENERAL
CATALOGUE.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



A New Rotating Cutter for Side Cut Brick.

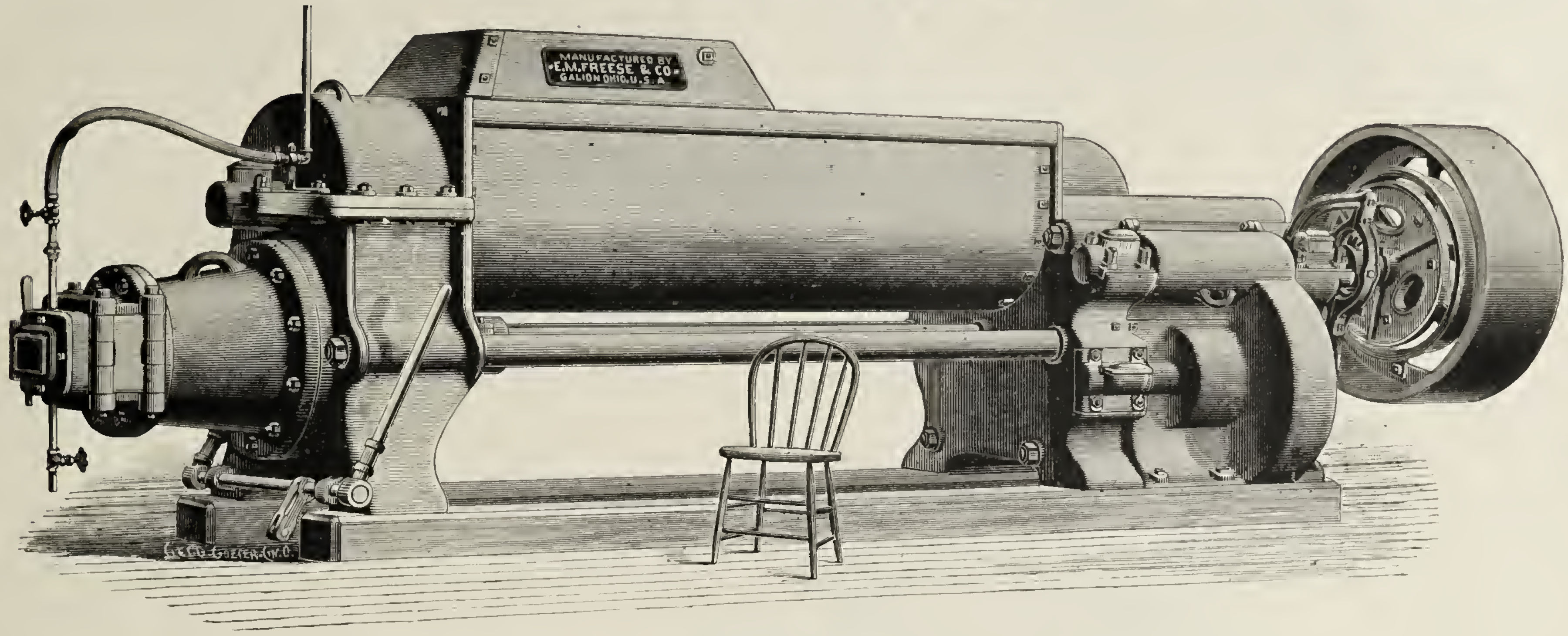
POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick.
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

E. M. FREESE & CO.,

Galion, Ohio.

The Original Union Brick Machines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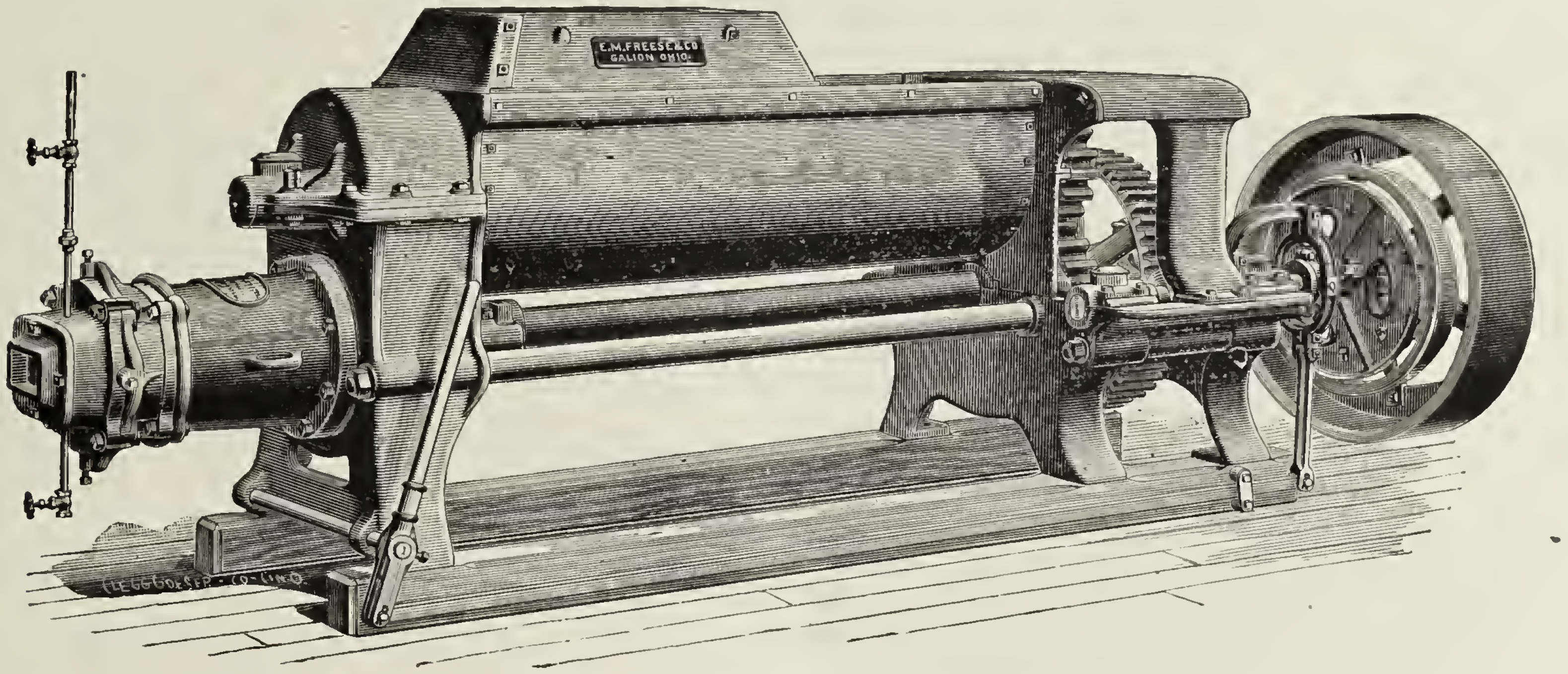
E.M.FREESE & CO.
GALION OHIO, U.S.A.

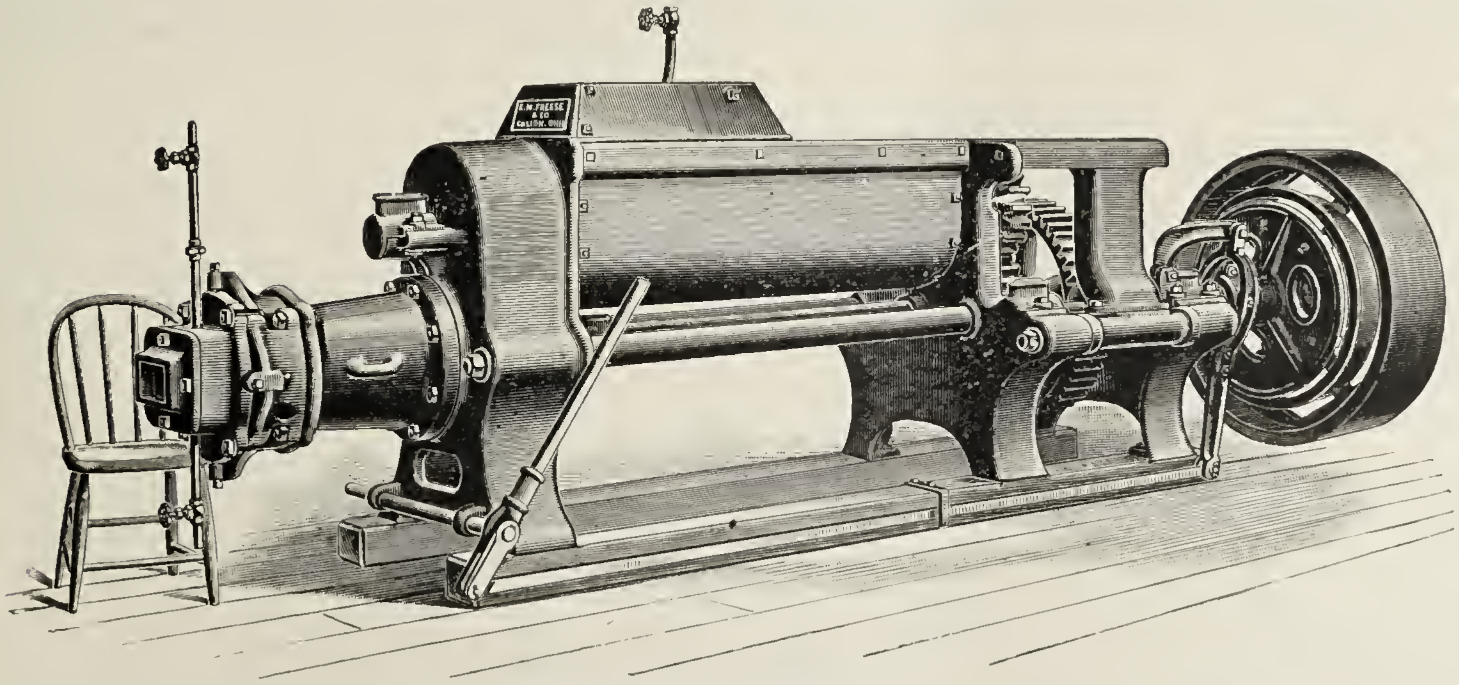
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



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These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

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No. 2 SIZE.

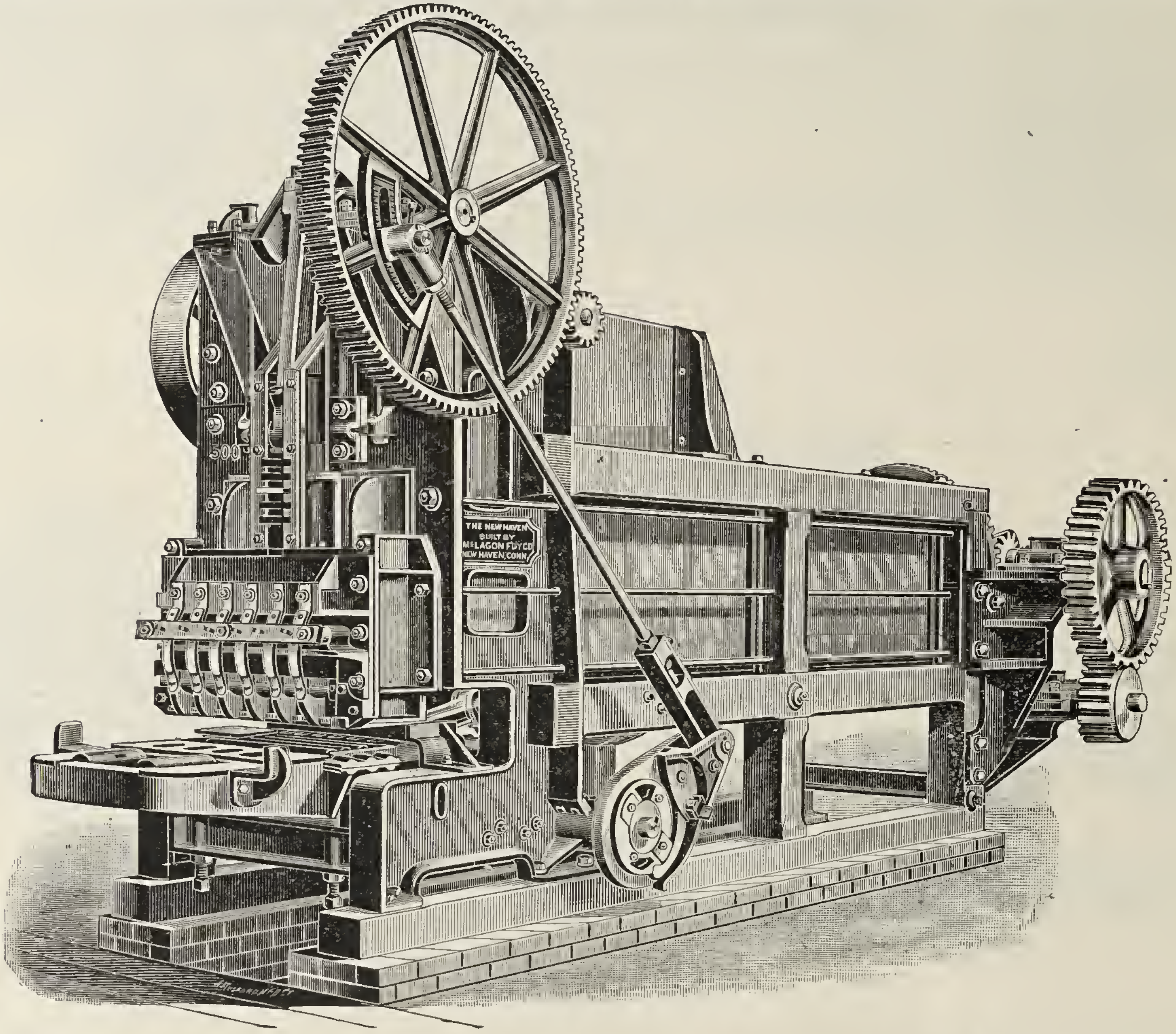
Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

AFTER ELEVEN MONTHS....
AND MAKING NEARLY NINE MILLIONS OF BRICK.

So Well Pleased

They Have Bought Another.



MECHANICVILLE, N. Y., Oct. 17, 1898.

THE EASTERN MACHINERY CO., New Haven, Conn.

Gentlemen—The machine we purchased of you last season has proven very satisfactory, and, while we cannot say that we have not paid out anything for repairs, yet we can say that **since November 3, 1897,** when we started the machine, **to the present date, we have made nearly nine millions of brick on this one machine,** and have had **no heavy bill of repairs** and **hardly lost any time** on account of the machine.

If there is any better machine made than yours we have not seen it.

Yours very truly,
BEST BRICK CO.,
Per W. N. CAREY, Sec'y.

We Aim to Satisfy Every Patron.

The Eastern Machinery Co.,

Mention the Clay-Worker

NEW HAVEN, CONN.

DO YOU WANT THE

BEST BRICK DRYER?

THE CUMMER DRYERS

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel, It is a fuel saver and hence a money maker.

If you want the best and most economical brick dryer don't fail to get our prices. If you want a cheap dryer, its no use to write us for we don't build that kind.

◆

Read what H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE: 60TH AND HAVERFORD STS. TELEPHONE 147, W. P.

H. C. CARROLL & SONS,

Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS:
57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

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The Cummer Clay Dryer is now in successful operation at many places in the United States. Like our brick dryer it is fully guaranteed to perform its work in the most effective manner possible and in any desired capacity. The **Cummer Dryer** succeeds where others fail. It will afford us pleasure to demonstrate its superiority over all other dryers.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell you troubles to"

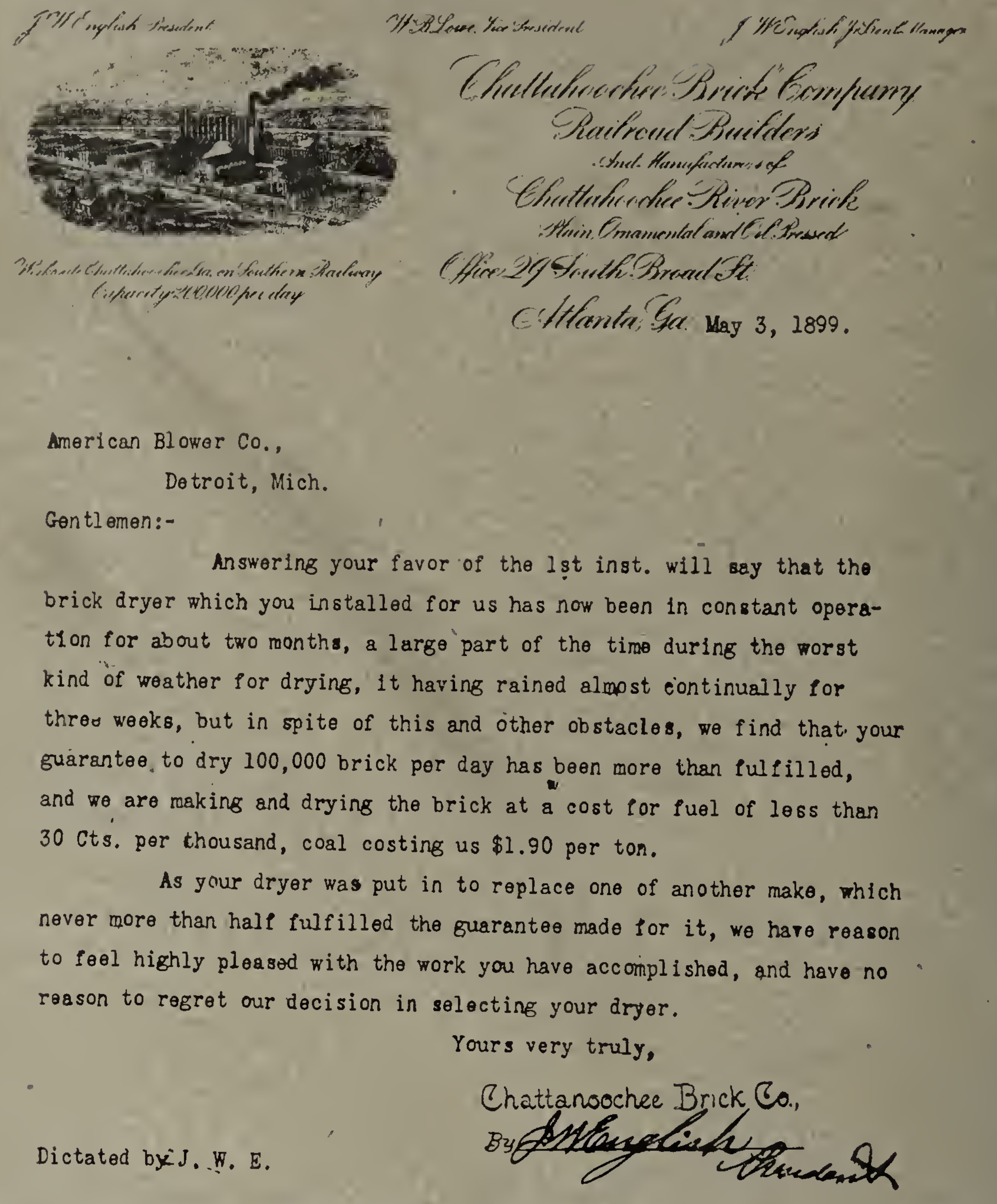
The F. D. CUMMER & SON CO.,

CLEVELAND, OHIO.

The "A. B. C." Brick Dryer

IS ALWAYS successful where all others fail . . . .

AMERICAN BLOWER COMPANY, DETROIT.



J. W. English President W. B. Lowe, Vice President J. W. English Jr. Gent. Manager

Works at Chattahoochee Ga. on Southern Railway
Capacity 200,000 per day

Chattahoochee Brick Company
Railroad Builders
And Manufacturers of
Chattahoochee River Brick
Plain, Ornamental and Oil Pressed
Office 29 South Broad St.
Atlanta, Ga. May 3, 1899.

American Blower Co.,
Detroit, Mich.

Gentlemen:-

Answering your favor of the 1st inst. will say that the brick dryer which you installed for us has now been in constant operation for about two months, a large part of the time during the worst kind of weather for drying, it having rained almost continually for three weeks, but in spite of this and other obstacles, we find that your guarantee to dry 100,000 brick per day has been more than fulfilled, and we are making and drying the brick at a cost for fuel of less than 30 Cts. per thousand, coal costing us $1.90 per ton.

As your dryer was put in to replace one of another make, which never more than half fulfilled the guarantee made for it, we have reason to feel highly pleased with the work you have accomplished, and have no reason to regret our decision in selecting your dryer.

Yours very truly,

Chattanoochee Brick Co.,
By J. W. English President

Dictated by J. W. E.

The Peerless System

UP-DRAFT, DOWN-DRAFT and CONTINUOUS KILNS

Is the Acme of Perfection in Brick Burning.

Read What They Say About It.

LaPRAIRIE PRESSED BRICK AND TERRA COTTA CO., Quebec.

"We have been using two of these rebuilt Kilns for the last two years, and the fact that we are now reconstructing another, DEMONSTRATES our ENTIRE SATISFACTION WITH YOUR PEERLESS SYSTEM."

ELMSDALE BRICK CO., N. S.

"Never saw a Kiln work so EVEN and FREE both in watersmoking and burning in all my life. The arches WERE AS GOOD as any other part of the Kiln."

JOHN CUBBINS SONS, Memphis, Tenn.

"After burning the first kiln that was changed, the second time, WE FOUND THE IMPROVEMENT SO GREAT and SO MUCH SUPERIOR to the old up-draft Kilns, that we are now changing our entire system to your PEERLESS PATENT."

JACOB KLINE, Baltimore, Md.

"Your system of burning GOOD HARD BRICK is without doubt THE BEST I have ever seen."

And There are Others.

No matter what you manufacture, or the capacity of your plant, if you make is of clay and want it burned write us for information. If you have kilns that are not giving satisfaction, or from any other cause you cannot burn your ware, write and tell us all you know about the trouble.

J. W. CARSON, Construction Engineer of Brick Works. **Montezuma, Ind.**

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THE CLAY WORKER

A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS. INCLUDING BRICK TILE TERRA-COTTA SEWER PIPE POTTERY ETC.

T. A. RANDALL & CO., PUBLISHERS.

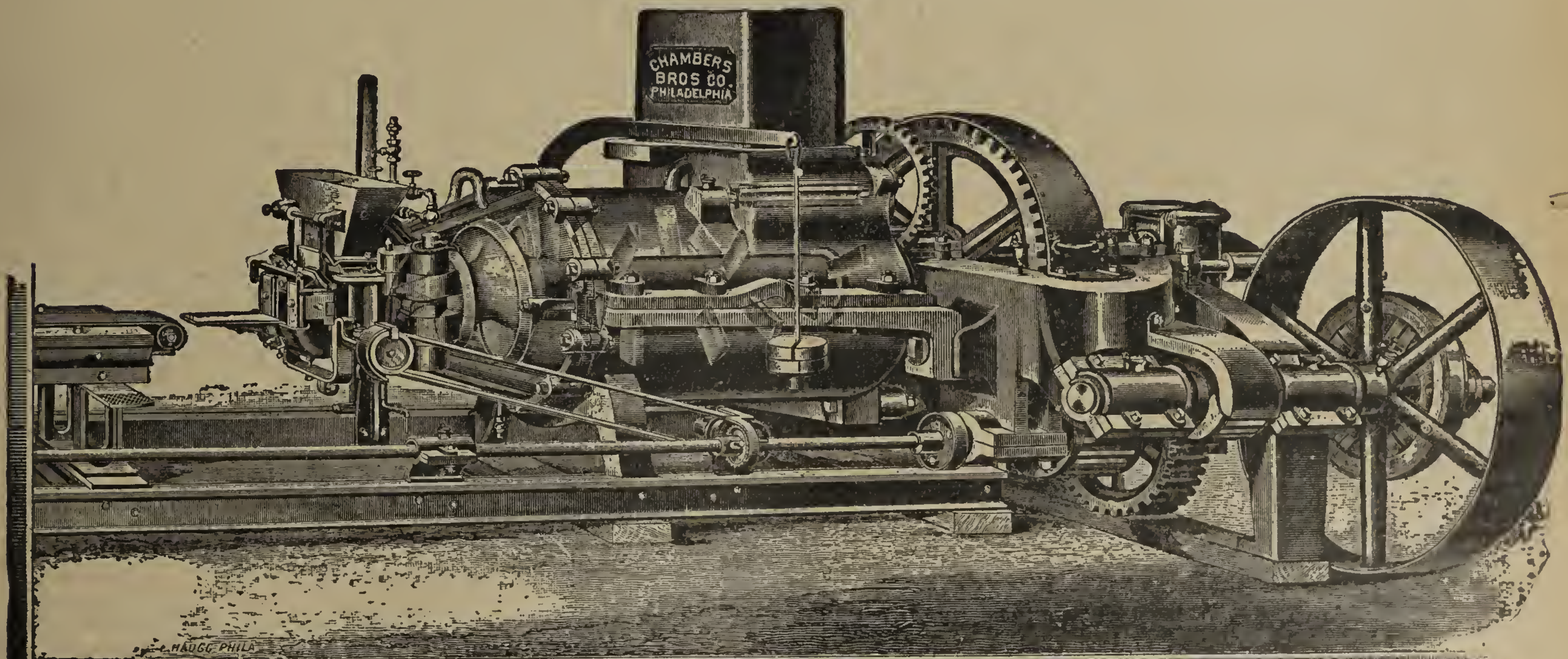
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXII, No. 1. INDIANAPOLIS, IND., JULY, 1899. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



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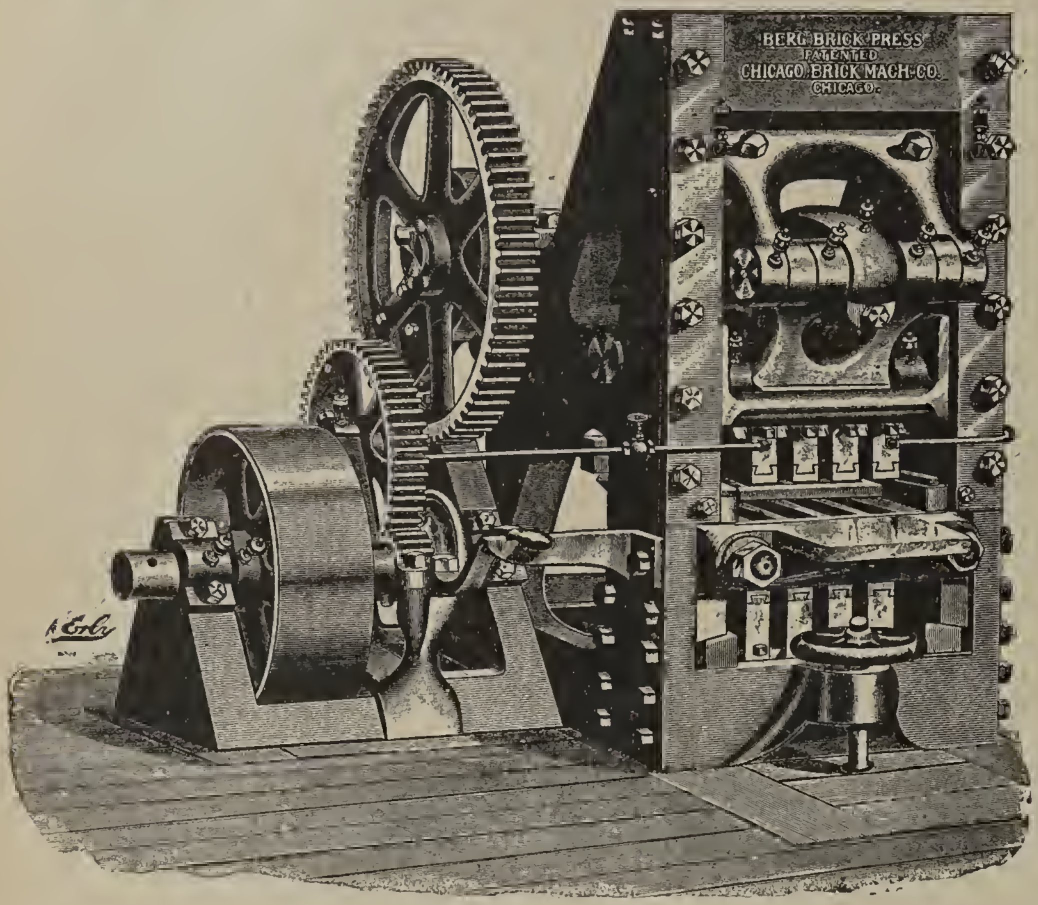

OUR **BERG BRICK PRESS** is the Most Modern in design and construction of all Dry Press Machines. Simplest, Strongest and most Durable.

It has three distinct pressures and an unequalled Mold Box. Absolutely unbreakable and fully guaranteed. Circular on application.

Our line of **Stiff Clay** and **Soft Clay Machinery** is also strictly **Up-to-Date.** All the latest improvements and most convenient devices.

Send for new 1899 catalogues.

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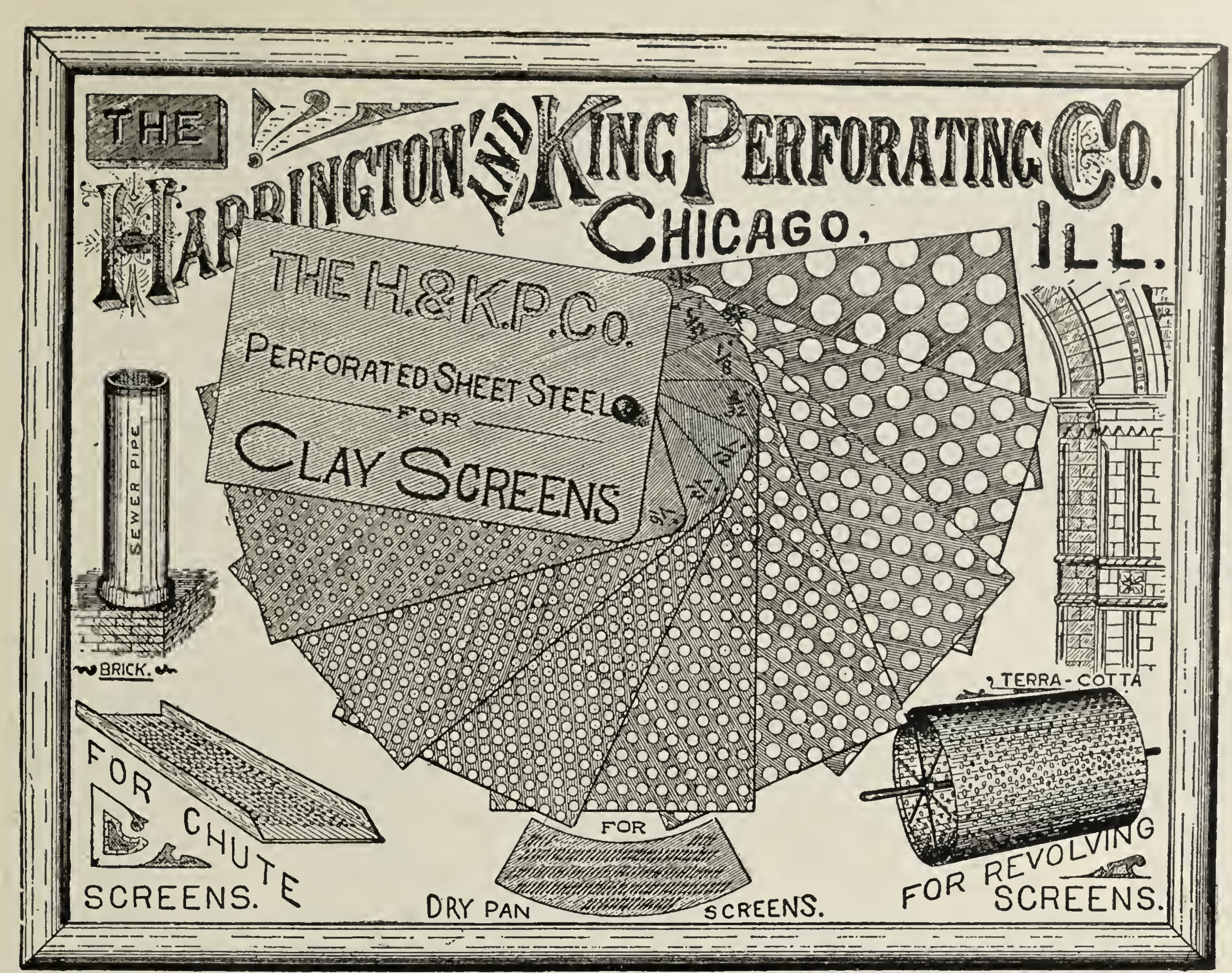

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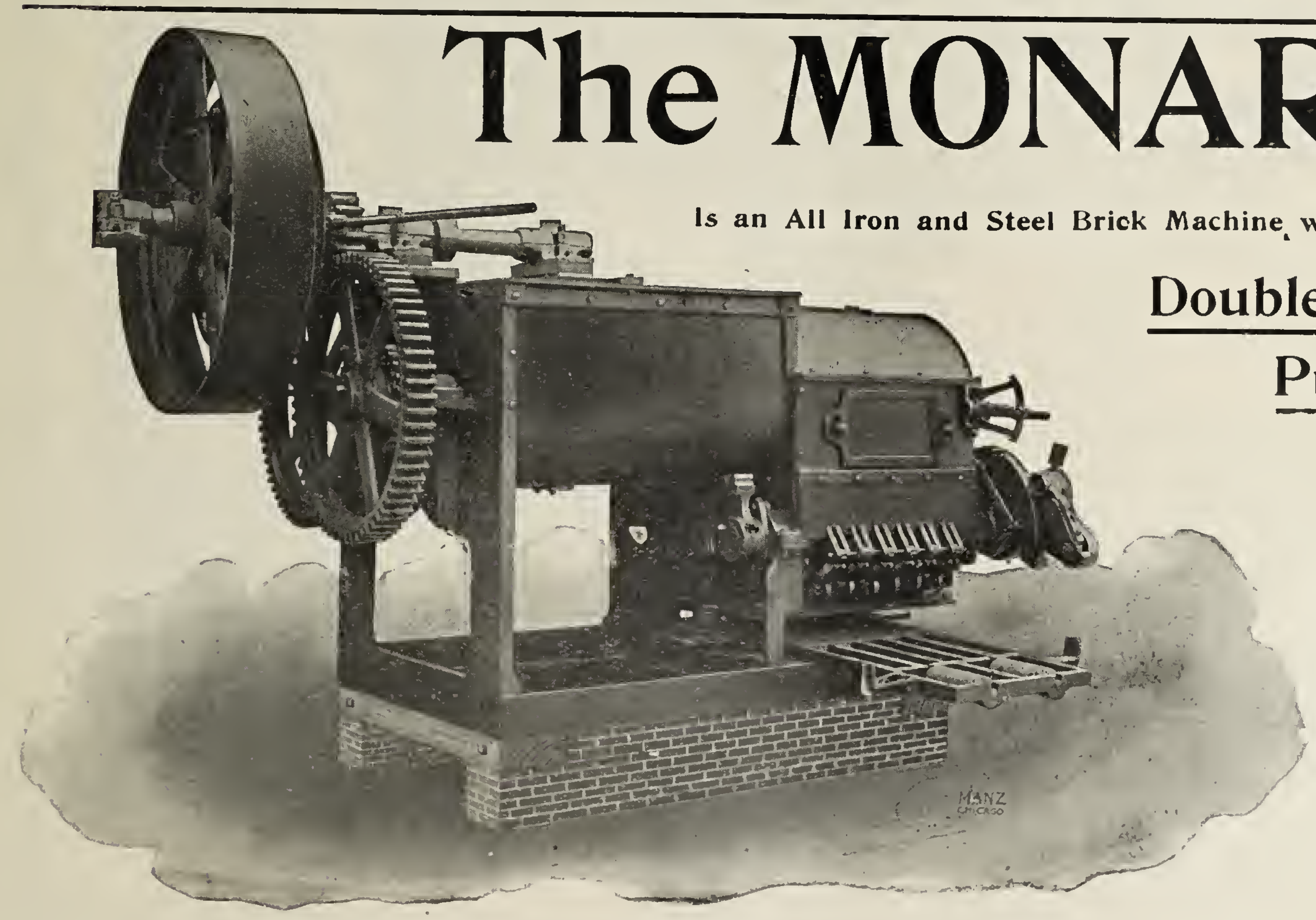

The MONARCH

Is an All Iron and Steel Brick Machine with

Double—

Pug Mill.

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SIMPLE
IN CONSTRUCTION,
DURABLE
AND . . .
POWERFUL.

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Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for 1899 Catalogue.

JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.

America's Greatest Brick Machine

A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

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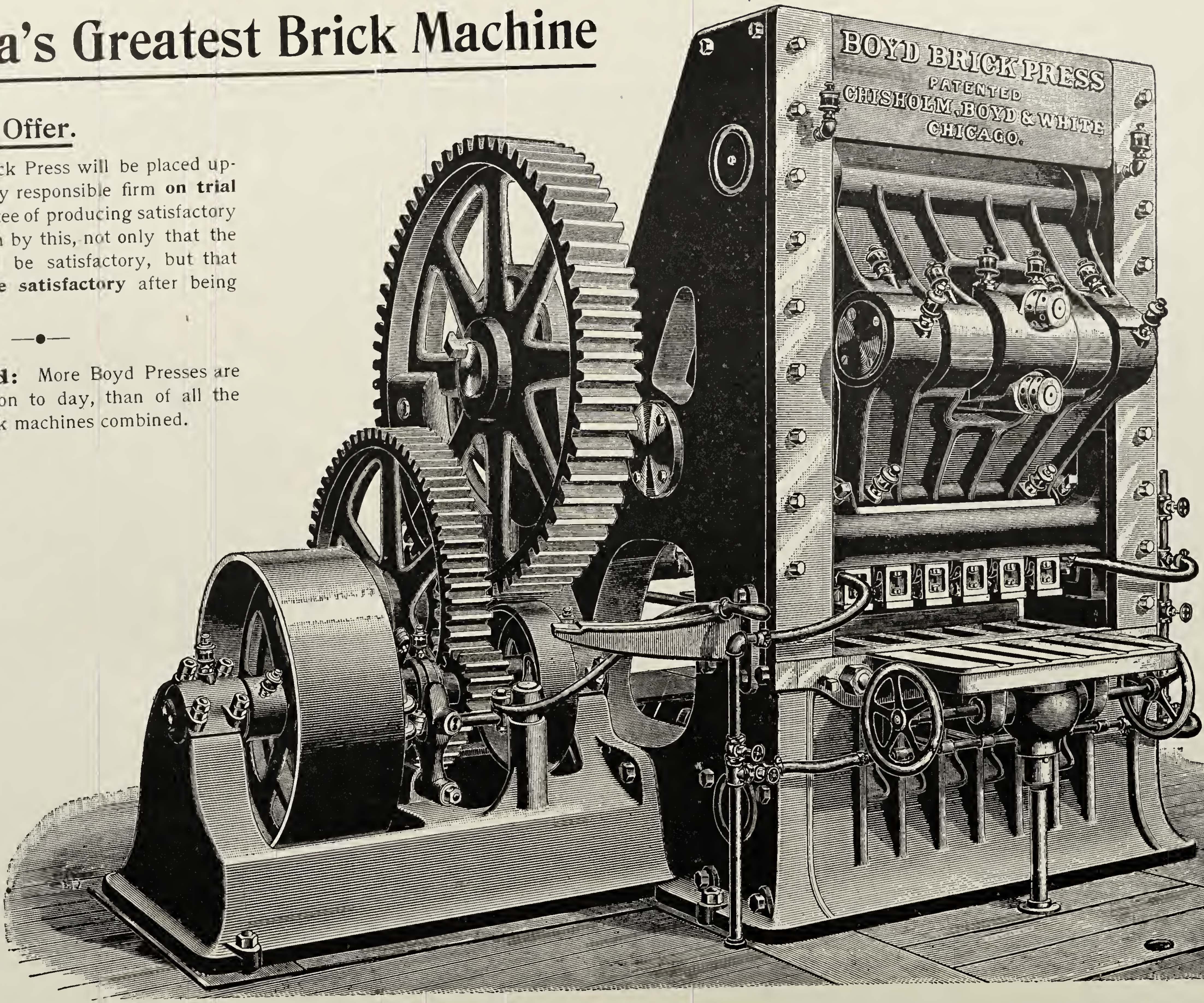
Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



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CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

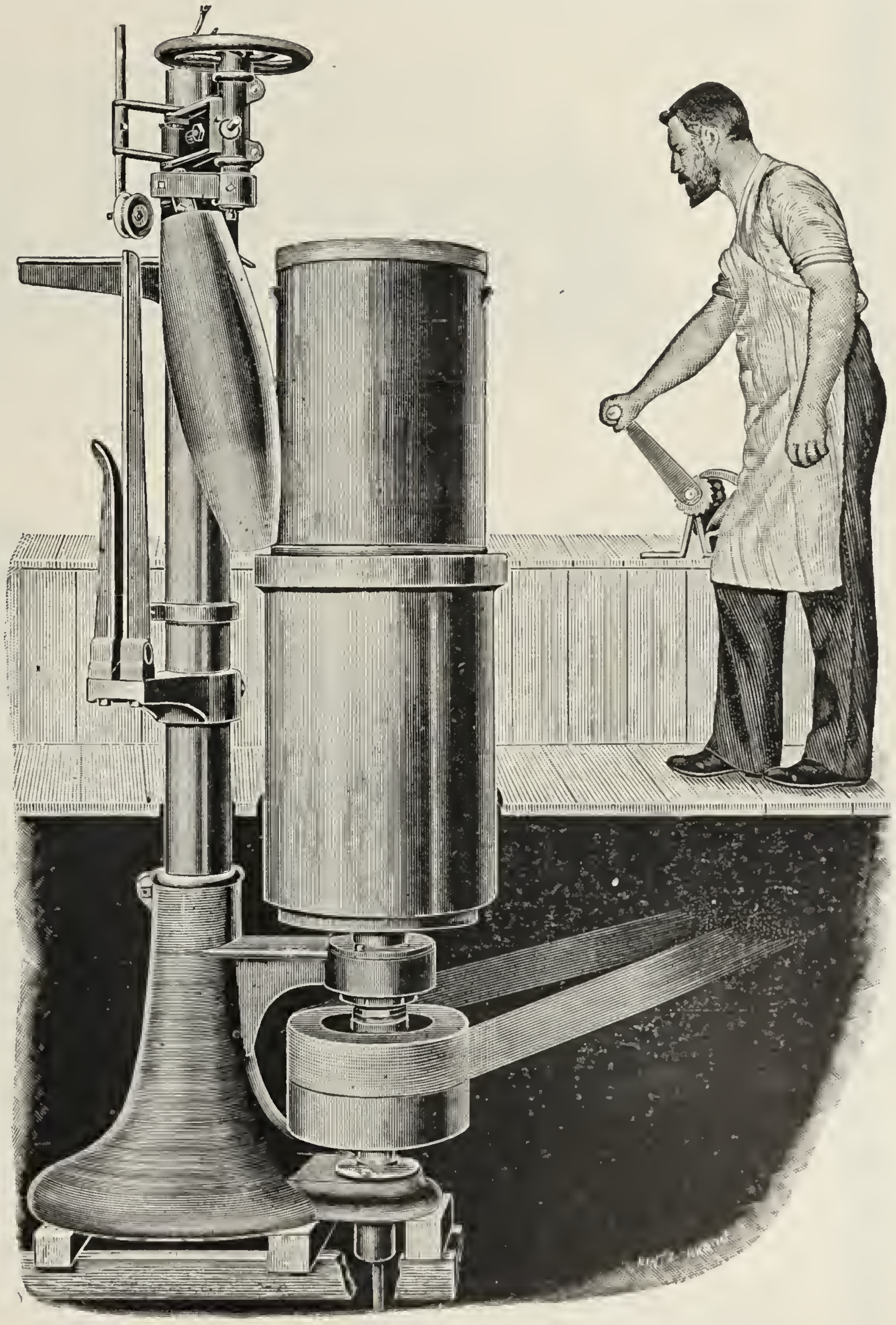
CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The BEST

Large Pottery Ware MACHINE ON EARTH.

RANGE 6 TO 60 GALLONS.
80—30 GALLON TUBS MADE IN 10 HOURS.

ALWAYS IN ADVANCE
READY TO MEET YOUR REQUIREMENTS.



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Superior Machinery
AND
Fair Dealing
IS WELL
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....AND. ..
Will be Maintained.

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SEWER PIPE AND
DRAIN TILE
MACHINERY.

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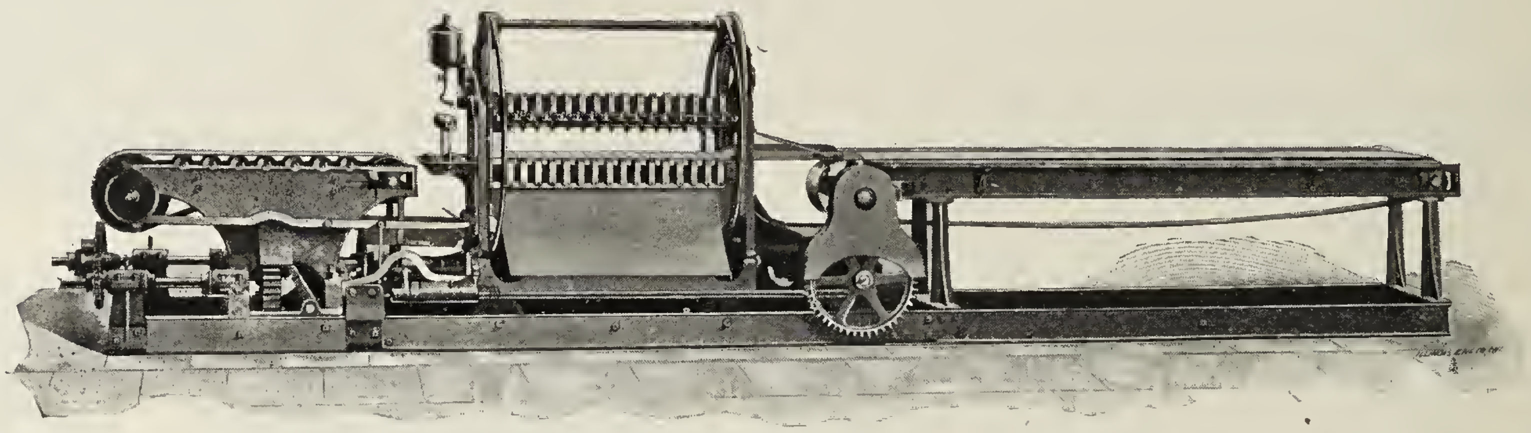
The Wonder Clay-

IS UNEXCELLED for the manufacture of **BUILDING BRICK, PAVING BRICK,**
Wonder Machines are made on original and correct mechanical lines. Second, they
known to expert mechanics. Hence their superior wearing qualities and large
Wonder Machines offer several distinct advantages: Owing to their peculiar
importance to paving brick manufacturers as it insures a product, whether repressed or
much better than laminated brick. The remarkable success of **Wonder Machines** is
ing, we will be pleased to give those who are interested, the address of manufacturers
for themselves. For capacity, quality of product and wearing qualities they are not

In addition to the machines shown on these pages, we also make a full line of **Clay Supplies,** and will cheerfully quote prices.



Cunningham's Improved Combination End and Side Cut Automatic Brick Cutter.

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OUR NEW COMBINED END AND SIDE CUT CUTTING TABLES ARE WONDERS TOO.

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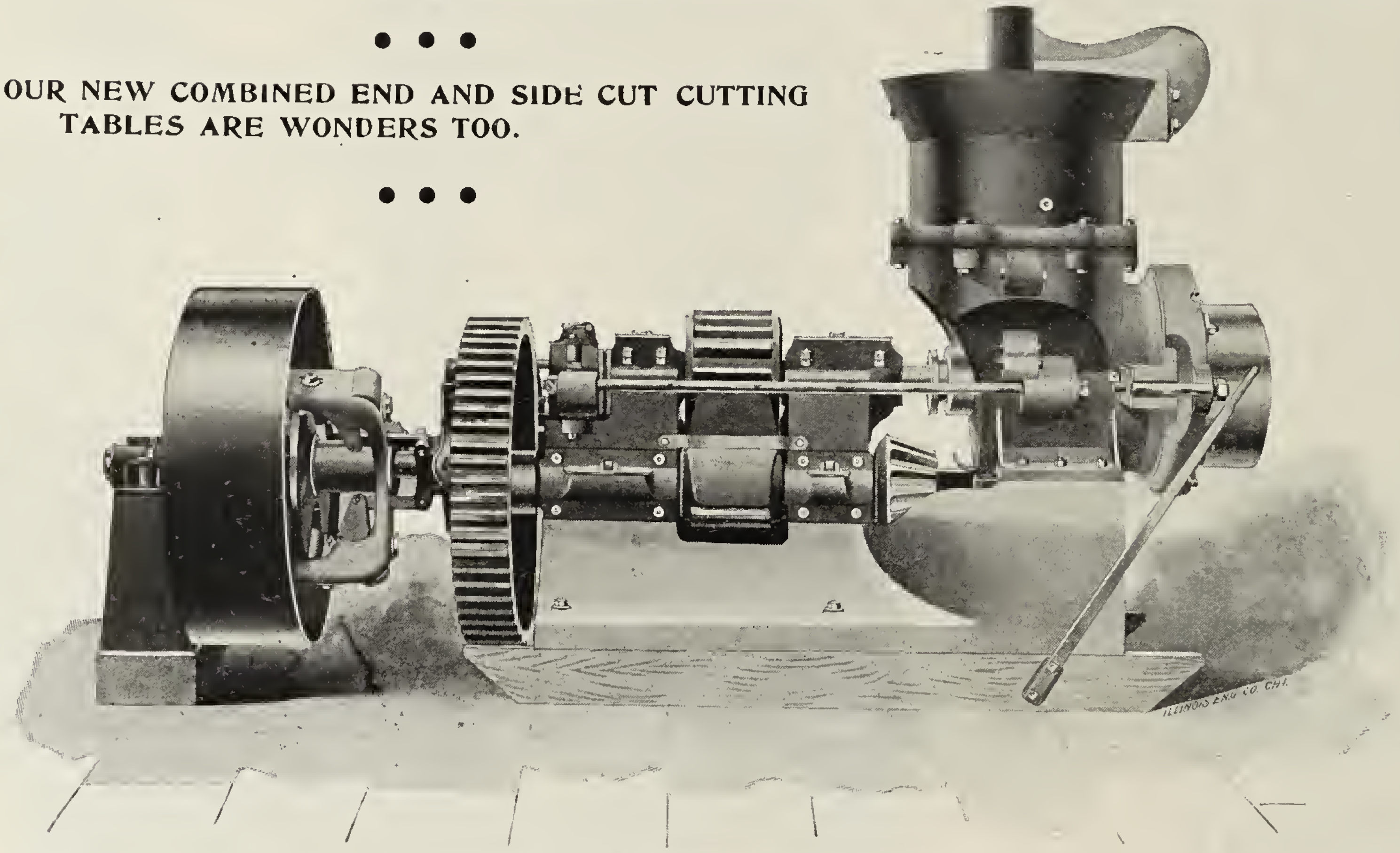

The Wonder Tile Machines, made in two sizes.

Have You Seen Our New Catalogue ?

CHICAGO AGENTS:
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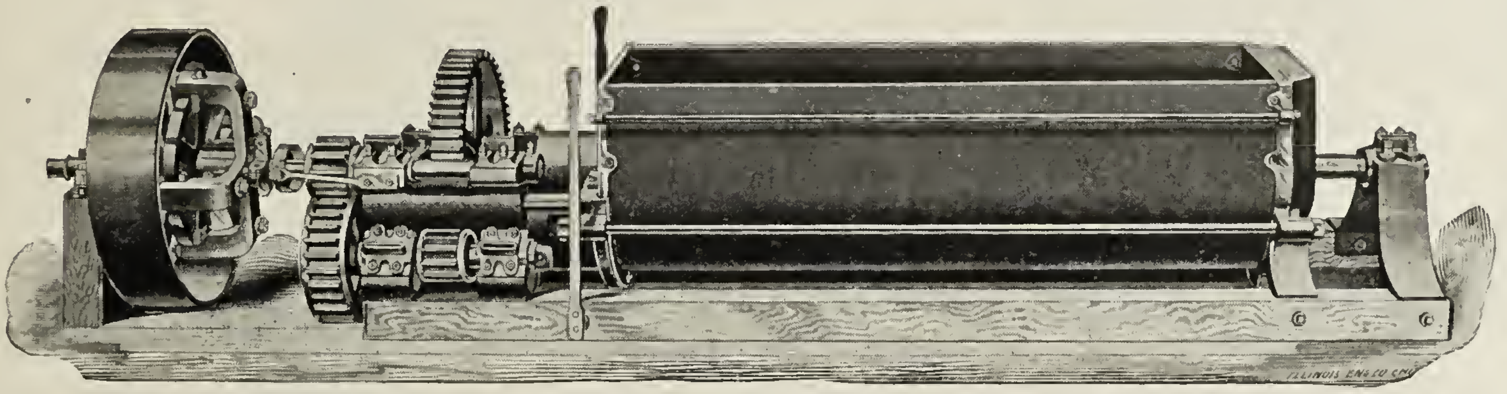
CHICAGO, ILL.

THE WALLACE

Working Machinery

HOLLOW BRICK and DRAIN TILE. This is due to several very good reasons. First,
are made of the very best material; and Third, in the best and most substantial manner
capacity.
construction, their products are remarkably free from lamination. This is of much
unrepressed, that will withstand the severe tests to which paving brick are subjected,
fully attested by all who have used them during the past ten years. As seeing is believ-
in their respective localities, who are using our machinery, for **Wonder Machines** speak
excelled by any.
Crushers, Pug Mills, Clay Elevators, Screens, Barrows and all Brick and Tile Yard



Open Top Pug Mills of any size and capacity desired.

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WONDER BRICK AND TILE MACHINES WILL WORK ANY CLAY THAT IS ADAPTED TO THE STIFF CLAY PROCESS.

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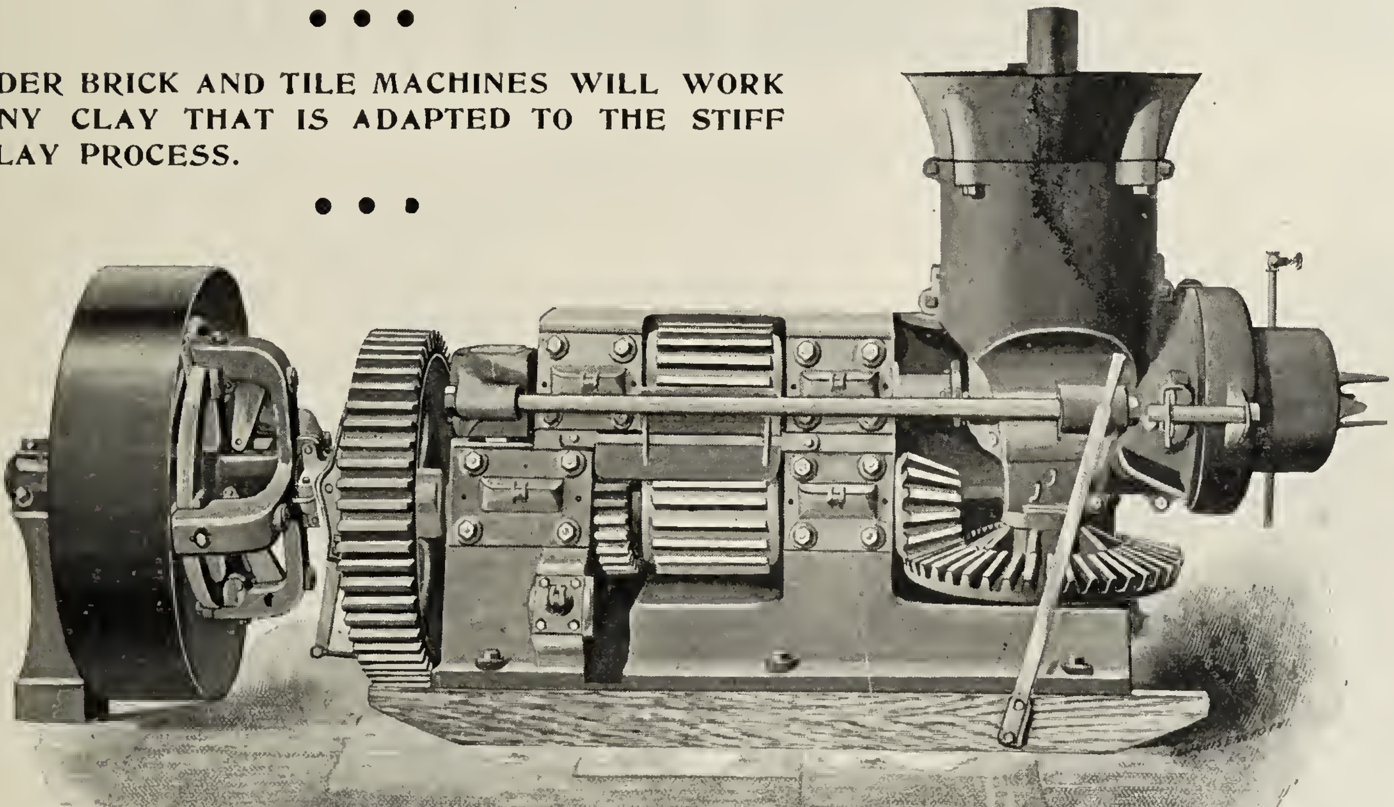

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Tile
Machinery,
Don't
Fail
to get
Our
Prices.**

Wonder Brick Machines, made in four sizes, with capacity ranging from 20,000 to 100,000 brick per day.

MANUFACTURING CO.,

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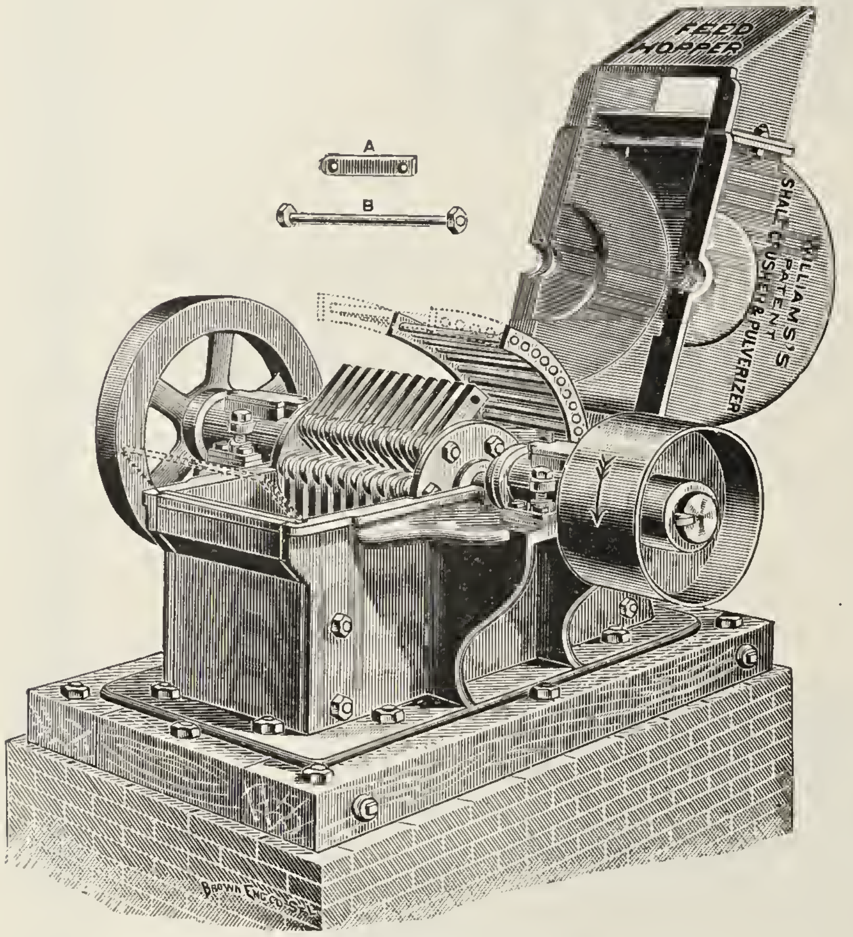
The WILLIAMS PATENT CRUSHER & PULVERIZER Co.,

of St. Louis, Mo., U. S. A.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WILLIAMS'S PATENT SHALE CRUSHER & PULVERIZER
A
B

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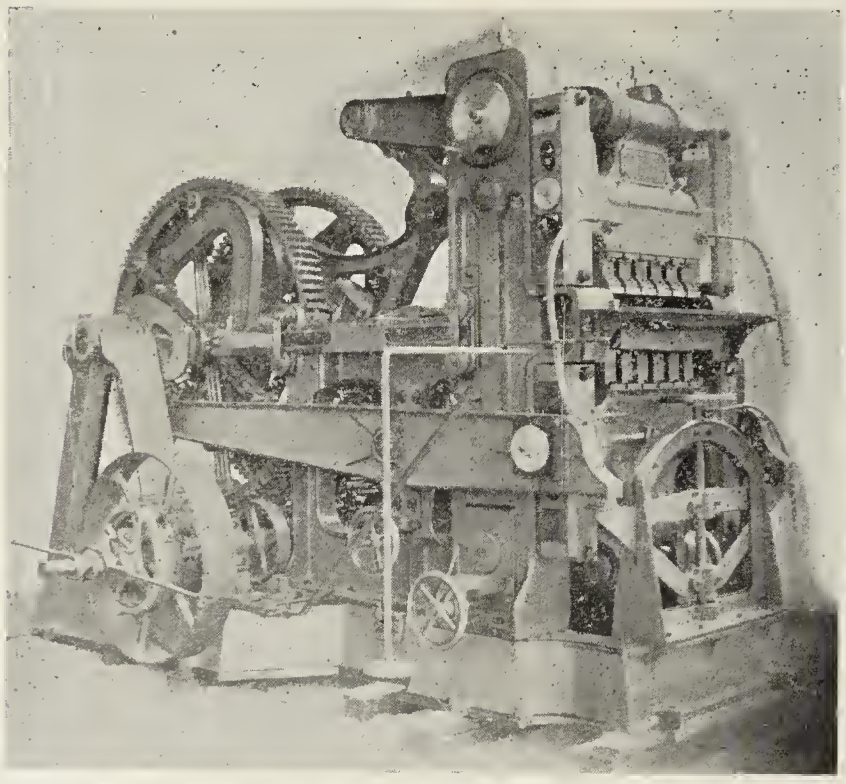

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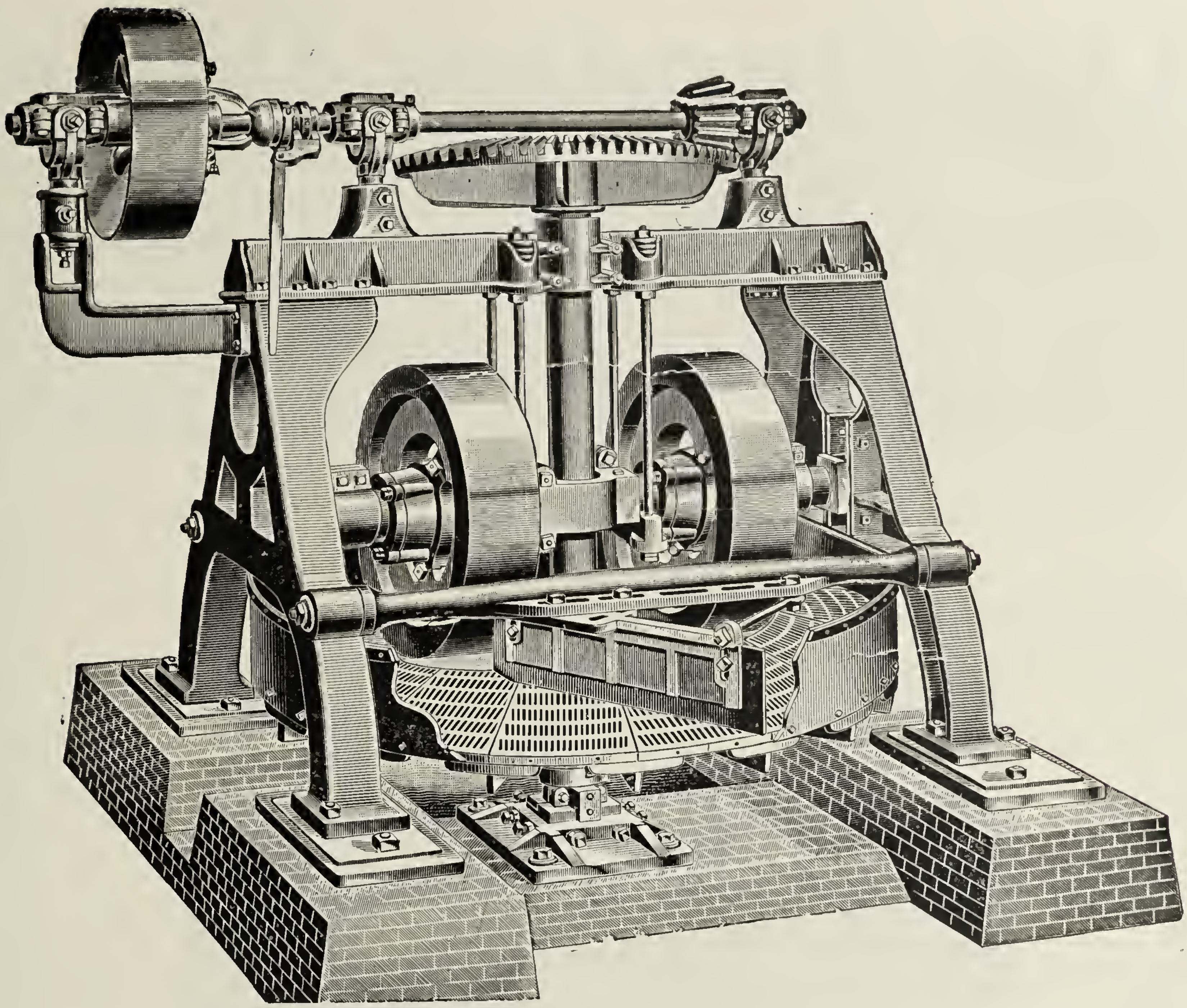

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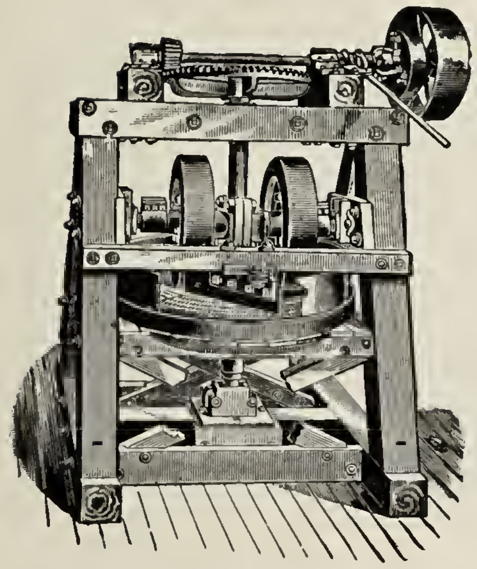

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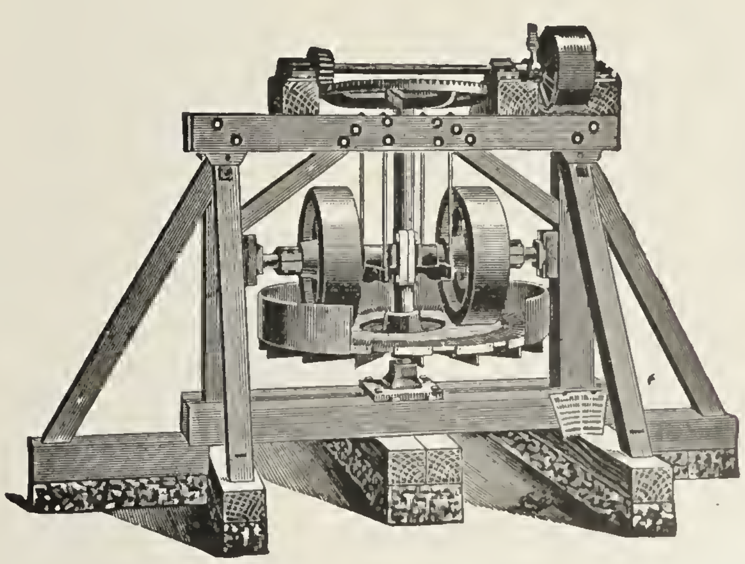

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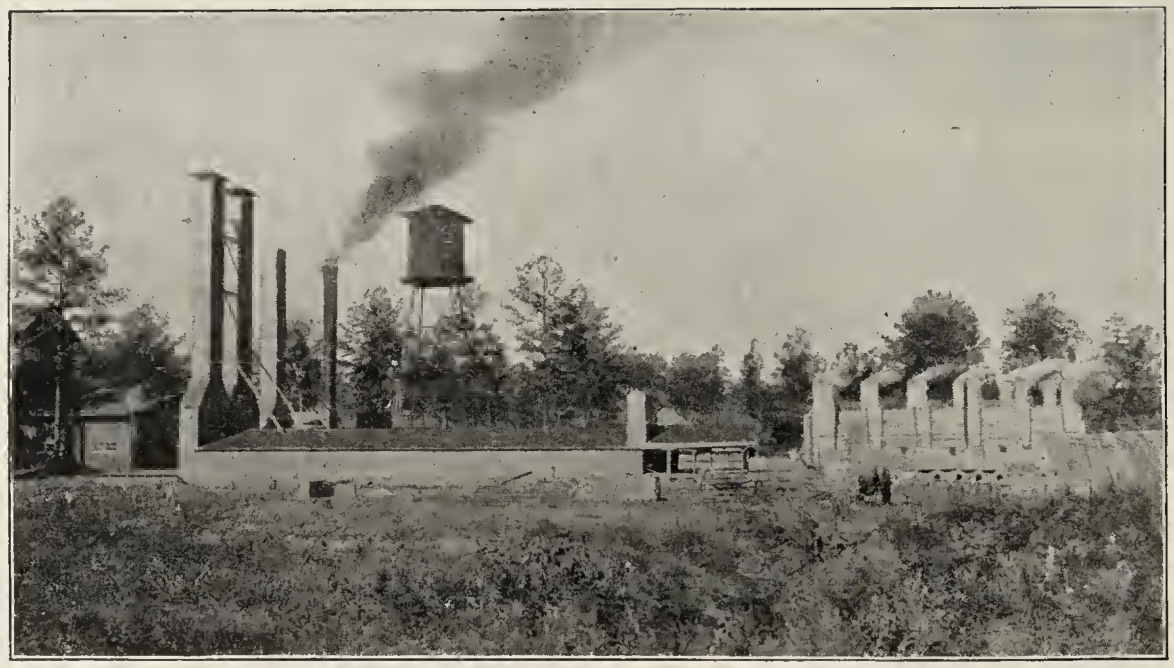

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THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. XXXII. INDIANAPOLIS, IND., JULY, 1899. No. 1

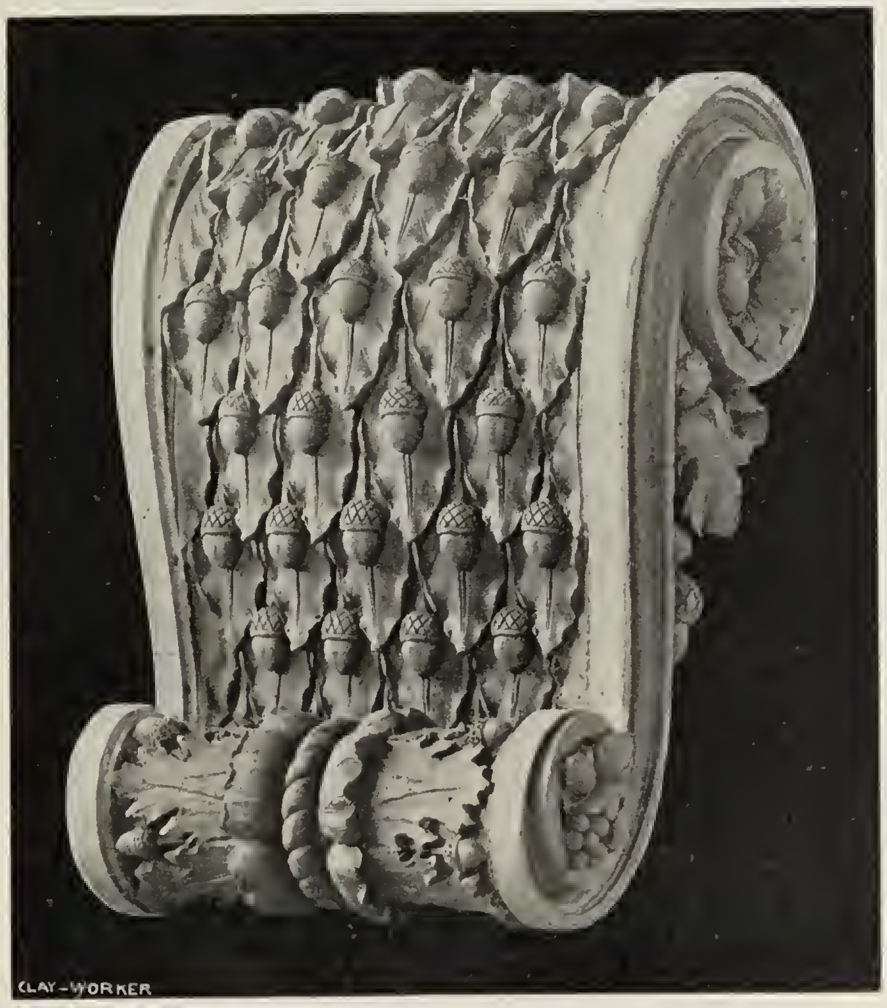
Written for the CLAY-WORKER.

TERRA COTTA ARCHITECTURE.

A Model Modern Structure—An Example of the Clayworkers' Art.

AMONG THE FACTORS which have contributed to make the Cleveland of to-day what it is—the eighth city of the Union in size, measured by population, but ranking higher, if commercial importance is included in the estimate—has been the body of business men and citizens associated together under the name of the Cleveland Chamber of Commerce. To write its history would be to write that of the city itself, for it has passed its half century mark, having been organized in 1848, with a membership of thirty, under the name of the Board of Trade of the City of Cleveland." To-day it has a membership of 1,275, and it has this spring entered into the possession and enjoyment of its new home, a description of which it is our pleasant task to present to the readers of The Clay-Worker.

This building, the general character of which is shown in the accompanying illustrations, is noteworthy in many regards, and, first, it may be stated that above its water-table line, which is perhaps four and one-half feet above the sidewalk, the walls of the building are entirely constructed of brick and terra cotta. About 2,000,000 brick have been employed, all but about 100,000 of them made or furnished by C. G. Barkwill, of this city, while the face brick, of the mottled Roman order, made from fire clays are of New Jersey manufacture having been furnished by Sayre & Fisher. We confess to no little surprise that these brick were not of Ohio clays, for Ohio certainly has suitable clays. Was there a lack of enterprise on the part of Ohio makers? These brick cost $45 per 1,000 delivered in Cleveland. The terra cotta facings and trimmings, which largely dominate the street fronts, were furnished by the Northwestern Terra Cotta Company, of Chicago, at a cost approximating $45,000. The casual observer would say these trimmings were of light gray sandstone, both the form of the blocks employed as quoins, belts, caps, sills, etc., suggesting stone, and the fact that Cleveland has, close to its borders, some of the best known building stone quarries of the country leads one to expect it. The blocks themselves show the tool marks common to stonework of this character. But here we may stop to take note of some differences in the character of the two materials, which no doubt had weight in determining the architects (Peabody & Stearns, of Boston), and their clients in giving preference to terra cotta. The many fine stone buildings of Cleveland, including its public buildings and its business structures and residences, are largely from northern Ohio sandstones. Originally near the shade of the terra cotta found in the building we are describing, they are now nearly black from having absorbed the soot and grime of the city. While the Chamber of Commerce building will show little change in the tone of its coloring when it shall have attained to the age of the oldest of the stone buildings. A close inspection of this terra cotta work shows that it has a semi-glazed face, not enough glaze to manifest it to the eye of the passer-by, but enough to insure that a good rain will carry away any soot and dust that may be deposited upon its surface, restoring it to its original freshness. If the beauty of coloring, both of the mottled Roman brick and the terra cotta trimmings which harmonize so finely at the present, was worthy the choosing and the seeking, then it is equally to be desired that the col-

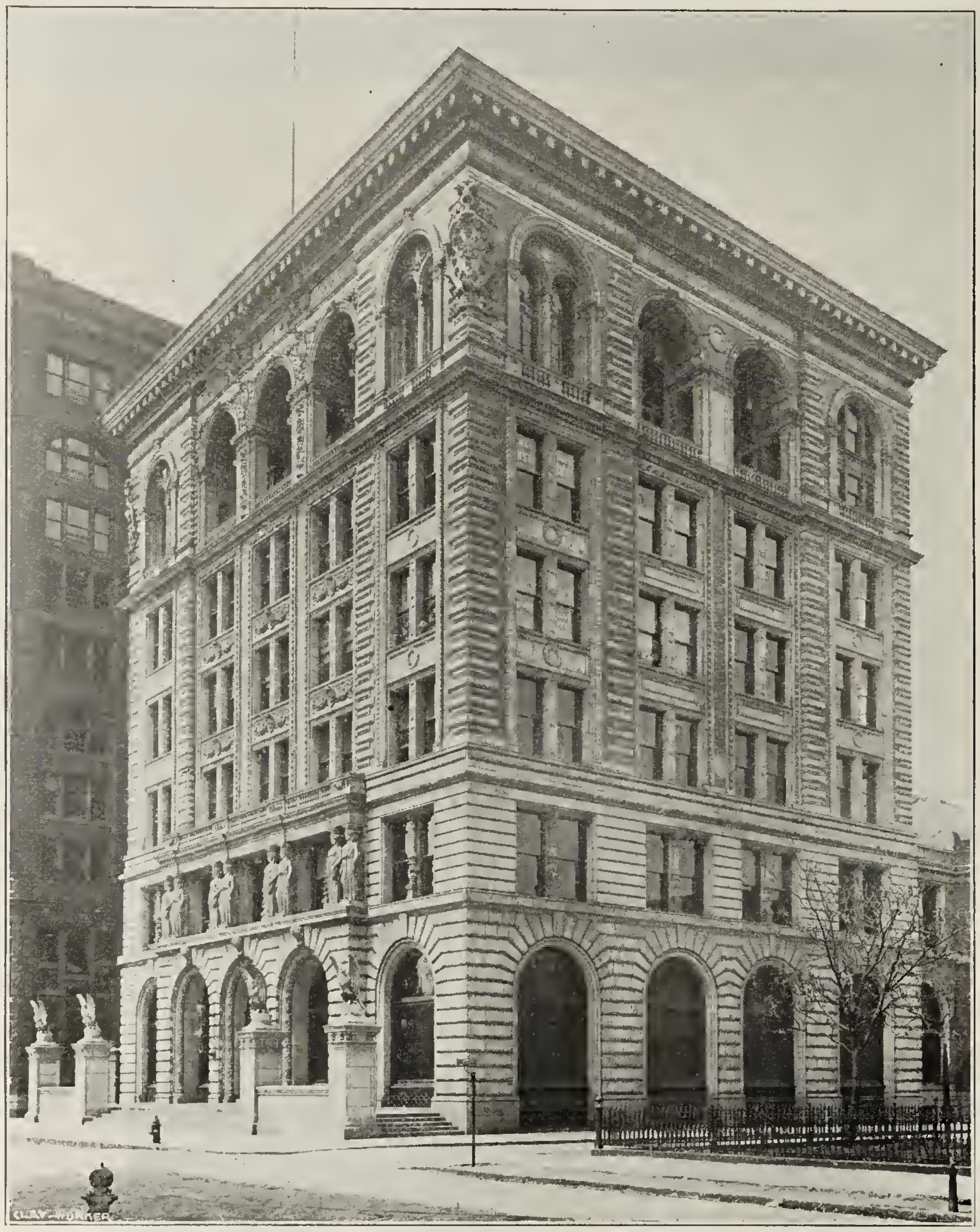


Terra Cotta Keys. Main Entrance Arches, Cleveland Chamber of Commerce Building.

ors and harmony of colors be preserved. It is probably true, however, that to have carried out the details of ornamentation in stone would have added a considerable burden of cost. While the tooth of time might be expected, with the help of the elements, to rob the ornamentation of its sharpness of outline in a few winters, no little of the work would have been deemed impracticable in stone on this account.

An attractive feature of the design is found in the eight colossal female figures which serve as supporting columns for a projecting balcony on the central front over the main entrance.

A platform some sixteen feet in width extends along the entire front of the building, with broad stone steps at both front and sides, the whole of New England granite, and from this platform arise four massive, polished granite columns, surmounted by eagles with spread wings, carved from the same granite. This approach, while in keeping, gives strength and character to what lies beyond. The same material is employed in the foundations arising some four feet or more above the sidewalk, in blocks of massive form, to the molded terra cotta water table. Mention is made of these details, as the engravings fail to reveal the breadth and character of the approaches to the building.



The Chamber of Commerce Building, Cleveland, Ohio.

Dealing now with general surroundings and dimensions it may be said that the building occupies the northwest corner of the public (Monument) square, and hence is a conspicuous feature of the park surroundings. A wide court separates it from its nearest neighbor, the ten-storied brown stone building of the Society for Savings, the two buildings occupying the full width of the block.

The Chamber of Commerce building has a frontage of 100 feet, and rises above the pavement 117 feet. It consists of two divisions, the first being the seven-storied front structure, 100x80 feet, the remainder of the space, 100x127 feet, being given up to the assembly hall and its approaches and accessories. This hall in the clear is 70x96 feet, and has a height of 40 feet in the clear. It has a seating capacity for about 1,200 persons. The vestibule and anterooms, which make up its approaches, as you pass from the broad main hallway of the main structure, impress one as ample and well suited to the requirements. The hall proper is beautifully paneled and decorated, the funds having been provided for its finishing, to the extent of $8,000, by a few members after the general building fund had been expended.

The first floor of the main building is fitted up for two banking offices, one on each side of the main hallway. The second floor is given up to the office of the secretary, committee rooms of the organization and an assembly hall for general meetings of the association not requiring the use of the main hall. This room, 32x36, contains the library of the association. The third, fourth and fifth floors are fitted up as offices and rented to railroad companies, insurance companies and others. The third floor has been most conveniently fitted up for the Builders' Exchange. The sixth floor is devoted to the social features of the organization, a fine banqueting hall, with parlors, etc. The seventh floor is given up to the kitchen, the janitor's apartments, etc.

This building was commenced in August, 1897, and completed in February, 1899, at a cost approximating $336,000. Eighty-eight per cent. of the money spent on the building was paid to Cleveland contractors. The general contract, amounting to more than $250,000, was performed by J. A. Reaugh & Son, of Cleveland.

Having spoken of the home, it seems natural to make some mention of the work assumed and performed by the organization which has created and inhabits it. The work of the organization is unique, and, as we have before hinted, its history is identified closely with the development and growth of the city. Cleveland has no Board of Trade, Produce Exchange and other similar organizations found in cities of its importance. Its one organization covers what may be deemed necessary in them all, and much more besides, through its various committees, such as its Manufacturers' Board, Maritime Board, Wholesale Merchants' Board, Transportation Board, Military Board, etc.

Perhaps in no way can the work of this organization be better set forth than by extracts culled from an address made by Mr. Ritchie, a former secretary long identified with it, in December, 1898. He said: The long and uninterrupted life of this organization attests the fact that its direction and management have always been in the hands of able, earnest, public-spirited and patriotic men, and we know that its existence and support were always esteemed indispensable. Through good times and hard times its standard was always held aloft, and the word "failure" was long ago obliterated from its lexicon. In its early days there were important civic questions to be discussed and acted upon, which had a far-reaching effect upon the future of the growing city. There were perplexing problems to be solved; there were municipal policies to be formed, and public improvements to be fostered and executed, and there were momentous national issues to be settled. * * * Fifty years ago it was no small undertaking to organize an association for the promotion of civic interests, and it was a far greater undertaking to successfully cement that union and thereafter maintain it through all the vicissitudes incident to those early times. Pluck, perseverance and untiring energy were the elements which sustained it then, and which constitute, by rightful inheritance, the mainspring of its life and vigor to-day.

It may be interesting to note that this organization had its beginning when Cleveland had a population of about 10,000, and it may be inferred that rare good sense must have characterized the body, and that personal opinion and preferences must have been continually suppressed and subordinated to the demands for the public good. We are told that political differences of opinion have not been a disturbing element, and, taking human nature as we find it, we are deeply impressed with the lesson which may and should be learned from the history of this body.

We make a further extract from the address alluded to:

"The popular conception of such a body seems to have been that of a trading or speculative board—a mild reflection of the exchanges where 'bulls' and 'bears' gambol with each other and play with fluctuating prices. That impression was out of harmony with the requirements of the city. The later growth of the organization attest the error of such a theory. Precisely the reverse is true. Its main strength lies in the fact that it is, constitutionally, what the city needs under present conditions. Men may make money in any way they choose, provided the way is legitimate, but to secure the fruition of the aims and ambition of the Chamber of Commerce of to-day, the energies of all men, whatever their calling, must be blended in harmonious co-operation for the public good."

The sentiment expressed is worthy of being noted and preserved.

Referring again to the address, we add a further extract:

"The practical education and training of business men fit them peculiarly for the duties of citizenship, and they are rightfully the leaders in every community. As a class they possess a comprehensive knowledge of the city's requirements, an appreciation of its resources, and the ability to promote its advancement; and as a class they will invariably be found on the right side of every public question. This organization is made up of men of opposite temperament and varied occupation, but the aim of every single member is the elevation and improvement of his city. They differ widely in many things, but they have a common antagonism to that which destroys and retards. Upon the principle that every member is interested in the commercial, industrial and municipal advancement of the city, this chamber has grown to its present importance, and upon that principle it must stand for the future."

In a recent interview had with Editor Randall he gave the writer to understand that the brickmaker was, as a rule, an important factor in the business circles of our cities. The writer has found this to be true. Brickmakers have secured open doors for him wherever he has sought information, and in the present instance he desires to acknowledge the efficient aid rendered by B. F. Many, Esq., of this city. Intelligent brickmakers in other cities and communities will certainly be interested in the methods of working we have briefly alluded to adopted by the Cleveland Chamber of Commerce.

Written for The Clay-Worker.

A BRICK FACTORY IN A WOODEN TOWN. No. 14.

By L. C. M.

BEFORE DESCRIBING the changes we made in our kilns to prevent so much checking and breakage in our arches, it might be well to consider the nature of the old clay, which burned so well, and the new clay, which did the reverse. Of course, the difficulty all lay in the nature of the clay, for we had taken much greater pains to produce good bricks from the new clay than we had ever done with the old. And the fact that a mixture of the two produced a good brick very much like the old clay made us still more doubtful of the material from the new bank.

Terra Cotta Caryatid. Cleveland Chamber of Commerce Building.

The clay of the old bank lay in two distinct strata. The upper stratum was about four feet thick. It was a coarse, sandy clay of a light gray color. The particles of sand were rough and sharp, but not large enough to need crushing before passing through the mill.

The second stratum was a fine black clay, very stiff and hard to work, and entirely free from sand. These two strata were dropped together and mixed in the proportion of about one-fourth sand to three-fourths black clay. The combination produced as fine a red brick as I have ever seen made by the stiff-mud process. After burning they were very hard and tough, and, when broken, the face of the fractures presented a rough, stony appearance. The clay of the new bank did not lie in strata, but was homogeneous from top to bottom. It was a fine plastic clay of a dark yellow color. It contained a great deal of fine sand mixed through the clay very thoroughly and evenly. This clay did not require so much power to work it as did the old clay, and the bricks when first made presented a very smooth and even appearance. When burned they were as hard as the old bricks, but not as tough, and when broken, the face of the fracture resembled glass more than stone. From these differences that were plainly to be noticed we formed the opinion that the fine sand of the new clay rendered it weaker and more glass-like when subjected to the unavoidable changes of temperature within the arches of our up-draft kilns. Although we used furnaces outsides of the kiln walls, it was impossible to prevent a great deal of cold air rushing into the arches whenever the furnace doors were open. The consequent heating and cooling of the ends of the bricks seemed to cause the heated ends to check and drop off, leaving a broken brick about six inches long. This experience with our two kinds of clay, one coarse and the other fine, led us to form some ideas in regard to coarse and fine sand used in reducing the plasticity of clays. We think that the coarse sand is preferable because its particles do not lie so closely together as do finer particles of sand, and leaves more room for the particles of clay to form the bond which holds the mass together. The extremely fine particles of sand seemed to cut the clay into such minute forms as to destroy much of its plastic nature and render the bond too weak to withstand the violent changes of the arches of a brick kiln. I have found the same true of lime mortar. Mortar made with a rough, sharp sand is much stronger and more durable than that made with a fine, smooth sand.

Terra Cotta Mullions in Second, Third, Fourth and Fifth Stories, Cleveland Chamber of Commerce Building.

There has been much written in The Clay-Worker in favor of grinding clay very fine in order to produce a good brick. But my experience leads me to enter a protest against grinding too fine any material that is to be used for reducing the plasticity of clays. A fine reducing material will enable one to dry their wares without checking, and also make the finished product look very smooth and fine grained, but it will never make as strong a brick as when a coarser material is used. A reducing material with sharp, rough corners is also much preferable to one with a smooth surface to its particles. The reason for this is very plain to one of a thinking mind. The rough, uneven surface affords a much better hold for the clay which forms the bond. In the heating and cooling of a brick every particle of clay must move and slip upon the various particles of clay which are in contact with it, and all this rearranging of particles must take place without destroying or weakening the bond, if the brick is to come out a first-class article. Hence, the necessity of giving the clay every possible advantage in its bonding material, and also making all changes of temperature slow and regular.

Another advantage obtained by using the coarser reducing material is that there is much less lamination than when the fine is used. And, again, the reason for this is very apparent to one familiar with the work of an auger machine. Each blade of the auger sends into the die a quantity of clay, and the next blade to follow forces another mass upon it, which must form a perfect union with the first or there will be a decidedly laminated appearance in the bricks. Where the clay is fine and smooth the first mass of clay has a very highly polished surface as it leaves the auger blade. The second mass comes upon it and finds a surface so smooth that the force of the auger cannot form a perfect union of the two. This is very different where a rough, sharp reducing material is used. The different layers of clay are ground together and do not slip upon each other, as in the former case, and thus much of the troubles resulting from lamination are avoided.

AMERICAN IMPORTS AND EXPORTS OF BRICKS AND CLAY.

THE FOLLOWING exports and imports of bricks and clay are just completed for the month of April, the latest period for which official figures have been compiled by the Treasury Department:

Building brick was exported in April to the amount of 1,474,000, valued at $15,017, against 725,000, valued at $4,723, exported in the same month of 1898. During the ten months' period ending with April, 1899, the exports amounted to 5,915,000, valued at $43,834, as compared with 3,827,000 exported during the corresponding period of the preceding year, valued at $25,357.

Fire brick was exported to the value of $14,682 in April, against $17,422 worth exported in April, 1898. The total exports for the ten months of 1899 were valued at $145,256, as compared with $100,294 worth exported during the same period of last year.

The dutiable imports of clay for the month of April, 1899, amounted to 13,936 tons, valued at $88,867, as against 7,654 tons imported in April, 1898, valued at $57,709. The ten months' total imports amounted to 97,025 tons valued at $658,730, as compared with 84,590 tons imported during the same period of 1898, valued at $591,133.

The dutiable re-exports of clay amounted in April, 1899, to 39 tons, valued at $436, against nothing during April of 1898. The total re-exports for the ten months amounted to 193 tons, valued at $989 during 1899, as compared with 56 tons, valued at $364 during the corresponding period of the previous year.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK. No. 18.

—Physical Testing.—

IN THE CLASSIFICATION of clay tests made by us in the March issue of The Clay-Worker the physical tests follow the chemical ones, and hence we must now consider those topics which belong to physical investigation of clays. We have given "Structure" as the heading of the first discussion along this line, and there is some justification for this, since structure is the first factor with which we must deal in speaking of the products which have their source in the decomposition of rocks independent of all other properties. By structure we mean, first, the character of the mineral components of an individual rock (and clay is a rock, geologically speaking), and, second, the characteristic formation produced by the different kinds of decomposition and other peculiar influences after deposition.

We have one foundational proposition to start with, namely, that all clays are derived from the decomposition of rocks containing feldspar. Now, since such rocks vary enormously in their chemical composition and physical form, they give rise on their decomposition to many different clays or clay-like substances.

Half of Terra Cotta Panel. Cleveland Chamber of Commerce Building.

In order to obtain a better hold upon the subject, suppose we trace a rock through its various transformations. To start with it is a crystalline, hard mass, say a granite, with which all of us are familiar. In examining it we can readily recognize the crystals of feldspar, quartz, mica, hornblende and augite. It looks to us as if it could withstand the wear and tear of eternity. But it will not. Let us imagine that life was given us long enough to watch this particular rock through its metamorphosis.

Depending upon the conditions to which our rock is subjected, it is bound to be gradually broken up by the agencies of water and air and the chemical agents carried by them—carbonic and organic acids—assisted by the action of heat and frost. The crystals of feldspar, which is a silicate of alkali and alumina, are first broken up, while the quartz is not affected, and the mica and augite are but slightly attacked.

But, since one of the mineral constituencies of the rock is removed, the bond is broken, and the whole falls to pieces, and, affording a large surface to be attacked, the residue from now on succumbs more readily. However, we are most interested in the feldspar, which has been leached out from the rock. What has become of it? Is it still feldspar? It certainly is not, for decomposition has changed its entire character. Its alkali has been removed, and a new compound has been formed through the addition of water, and we have what the chemist calls the hydrous silicate of alumina.

In place of the well-defined, silky crystal there is now a soft, more or less plastic mass, which we call a kaolin or clay. The first of it happens to be free fluxing impurities, which is usually shown by its white color; the second if it contains silicate of iron, lime or magnesia.

We can readily see that this depends, first, upon the kind of rock from which the matter has been derived, and, second, upon the sort of treatment which the residue has received. From a rock like our granite, which is composed of minerals which contain a good deal of iron and other fluxes, we have no right to expect a kaolin immediately on decomposition, and, again, a rock with very little iron in its make up may be broken up in bad company, with other rocks high in iron, and thus its residue becomes impure and is called a clay.

But any weathered silicate, when found where the original rock has been, is called primary. We thus have primary kaolin and primary clays, which are readily recognized as such by the mineral fragments still found in them, which gave them a distinct structure which any one who has ever observed it will recognize immediately. A microscopic examination will reveal the different minerals in a striking manner, and thus lay bare the secret of the formation of clays.

Whoever has been fortunate enough to examine a section of a primary clay under the microscope will say that it is a treat. By means of a finely ruled glass plate the size of the sharply defined particles of different minerals can be readily determined. This has recently been carried to such perfection that a European mineralogist actually makes complete analyses of clays by means of the microscope without using any chemical reagents. He first makes a section of the material to be examined and then places it under the instrument. With the help of small squares formed by ruling a glass plate very closely, and recognizing the distinct minerals, he calculates the area occupied by the different minerals by means of an averaging mathematical formula.

Having obtained the areas occupied by the minerals, and knowing their standard chemical composition, he is enabled to calculate the chemical composition of the whole. The results obtained by him were astonishing in their accuracy, being within 1 or 2 per cent. of those from chemical analysis. If perhaps as yet not of strictly practical value, the information thus obtained is, to say the least, very interesting, and in time we will learn to use it in a direct, practical way.

But to return to the product of decomposition derived from our granite rock. Having established the fact that it is a primary material by virtue of its structure, we at once possess some important information in regard to it. We know that its plasticity, as a rule, is not developed to its best, since the original rock structure has not been destroyed, and that in working it it is necessary to do by artificial means what nature has not completed. In the case of kaolin an elaborate washing process will have to be gone through with.

But the vast majority of clays does not belong to the primary order. When our granite has been broken up, nature's work does not stop. It means to destroy the original rock structure completely. The action of water and air still combines. In the great majority of cases the primary deposit is compelled to leave its native resting place and is washed away, forming new deposits. On the way it meets with many obstacles, is rubbed against rocks of all sorts, and is mixed with them in endless variations.

Terra Cotta Bracket in Cornice. Cleveland Chamber of Commerce Building.

It is quite evident that the removal changes the grain of the clayey matter. On being continually ground it becomes finer and finer, so that, when forming its second deposit, being now called secondary clay if impure and secondary kaolin if still pure, it consists of fine matter brought on from the original granite or other rock and other substances gathered on the way. It is obvious that the manner of transportation is of the greatest influence upon the clay. If carried along by a more or less rapidly moving current the finer particles are separated from the coarses ones, the latter being deposited long before the former. Hence, there will be found deposits of mineral detritus followed further along by layers of fine clay.

Similarly, in quiet water, particles of higher specific gravity will be deposited before those of lower, in which case we will have the clay substance and mica flakes deposited on top of the rock detritus, quartz, etc., a fact which can be verified at every clay bank.

Of course, a clayey deposit may be removed from one place to another an indefinite number of times, and each time the original structure is destroyed more or less. In this manner, and by coming in contact with lime stones, etc., the limy clays, marls and loams are produced. A primary kaolin, when moved once or oftener without mixing with nonplastic matter, keeps on increasing in plasticity, but is certain to take up some iron, which we know is present everywhere, which causes it to burn to a more or less buff color. An example of this kind is the Florida ball clay, which is a secondary or tertiary kaolin.

In studying the structure of clays we must always keep in mind the treatment which they have undergone since being removed from the place of decomposition. The formation of kaolin we have discussed, it is hoped, sufficiently clear so that we may understand its character. Let us not forget that it is either primary when found in situ or secondary when removed from the original rock. It does not necessarily follow that secondary kaolins are always less pure than the primary ones. There are cases where the former are extremely pure, although ordinarily the chances are against this being true. An impure clay though found in situ, is never a kaolin, so that when we speak of a secondary kaolin which is not pure it is best to give it some other name, as in the case of the Florida ball clay.

In speaking of the structure of clays we must distinguish clearly between two factors which give a clay its characteristic qualities. The first is its individual mineral composition, its amount of clay base, its contents of feldspathic and micaceous detritus and quartz, together with the size of the respective grains, and the second the influence wrought upon it by the manner of the deposition.

It is not an easy matter to give a clear-cut classification of clays in regard to their manner of deposition, but for practical purposes we may divide clays (not including kaolins) roughly into four classes—drift clays, alluvial clays, shales, fire clays.

The first group comprises all clays moved by the action of glacial ice. These, commercially speaking, are the hardest clays to work, since the irresistible masses of ice moving down from the north have exerted no separating action upon the debris carried along, but have jumbled together all sorts of mineral detritus. As a result we find the drift clay full of coarse rocks, limestone pebbles, etc., and it usually is an unoxidized, tough material.

The alluvial clays are deposited from rivers and streams, and hence are found in river valleys. From what we know of the effect of water deposition we can readily understand that as the water of the river was flowing rapidly or sluggishly the matter deposited must either be coarse, including pebbles and coarse sand, or of varying degrees of fineness. And actually we find the alluvial clays in all variations from extremely fine and plastic deposits to sandy ones, finally ending in gravel. Older and large streams have formed thick banks of this clay, which is quite uniform, while smaller and changing streams deposit clays of extremely variable quality, sometimes too plastic, sometimes too lean. Alluvial clays are of great importance to brick manufacturers located in the great river valleys, and often they are of a most excellent quality, as those along the Mississippi and Ohio rivers.

Shales differ from alluvial clays in being usually deposited from almost still, deep water and having their original structure largely destroyed by pressure, giving rise to a pronounced parallel structure. A chemical distinction between them and clays cannot be made, for any clay, whether pure or impure, if subjected to a metamorphism, gives rise to a shale. If this is carried too far we obtain slate, which is devoid of plasticity. Ordinarily shales become readily plastic in working, and, being to a large extent deposited from still water, they are very fine grained and uniform in composition, which makes them such a valuable class of clays.

Fire clays cannot be said to differ from the shales in manner of deposition, but they have not been subjected to pressure, and hence show no parallel structure. They may have been at one time quite impure, but have undergone peculiar changes after being deposited, being subjected to the leaching action of organic acids, which have removed more or less of the impurities, thus rendering the clays more infusible. Clays where situated below swamps and intense growths of organic matter have been purified in this way, and as a matter of fact the great majority of our fire clays is always associated with the coal measures.

The plasticity of fire clays may vary greatly. In point of refractoriness, one kind of fire clay, and the hardest one, the so-called flint clay, is of special importance, which, though interstratified with plastic clays, shows but little plasticity, but is very pure. The exact nature of the formation of flint clays is as yet unknown.

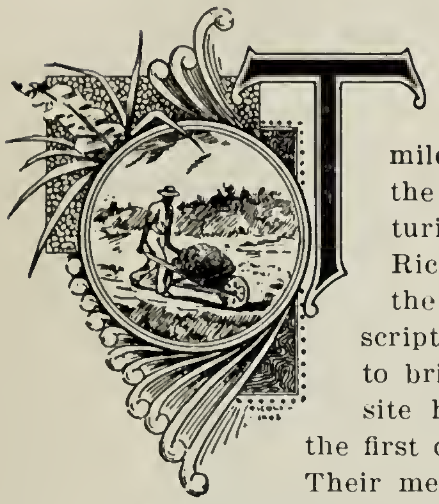
As a subclass of clays there might yet be mentioned the residual clays, usually oxidized red clays, found on top of limestones. These vary much, according to the kind of rock from which they have been derived. Their thickness, as a rule, is never very great.

AMERICUS.

Written for the CLAY-WORKER.

MAKING BRICK IN PUERTO RICO.

A Yankee Enterprise in Our New Domain.



THE PUERTO RICO COMPANY'S brickyards are situated on the Pastillo road, about one and one-half mile from Ponce, the principal seaport of the island. As this is the first manufacturing industry of any size in Puerto Rico that has changed into the hands of the Americans, a short history and description of the plant may prove interesting to brickworkers in the States. The present site has been a brickyard for forty years, the first owner being a Frenchman, Mr. Phillip.

Their method then of working was as follows: They took eighteen inches off the top of the clay. This was soaked twelve hours and tempered twelve hours. The pit was an odd affair about thirty feet in diameter. It had four entrances sloping from the level of the ground. The tempering was done by four yoke of oxen driven through the pit. The mud was carried out of the pit on trays instead of wheelbarrows. The molder sanded his mold, first dipped in water, making two slush brick in each mold. These were left on the floor till dried, and then hacked up ready for kiln. The kiln was a hole in the ground, with sloping furnaces to charge the fires. The capacity was about 12,000.

1

2

4

3

1. Breaking Ground for the New Plant. 2. Laying Foundation Walls for New Kiln. 3 and 4. Resting under the Palm Trees.

After the death of Mr. Phillip the yard was bought and run by a Mr. Foscall. His manner of making brick was the same as his predecessor's. After ten years the yard again changed hands, being purchased by Mr. Focurandy. This gentleman changed the yard into the method of working used up to the time of Mr. Chardon's purchase. He produced bricks of about the same quality as before, and used sizes running from ten by four and a half by two to twelve by six by three. The price averaged about $5 gold per M.

After fifteen years the yard was again sold, this time to Mr. Lino del Toro. During his management the yard reached the height of its prosperity, running full capacity the year round, and getting prices the highest in its history—$12, $16 and $18 gold per M.

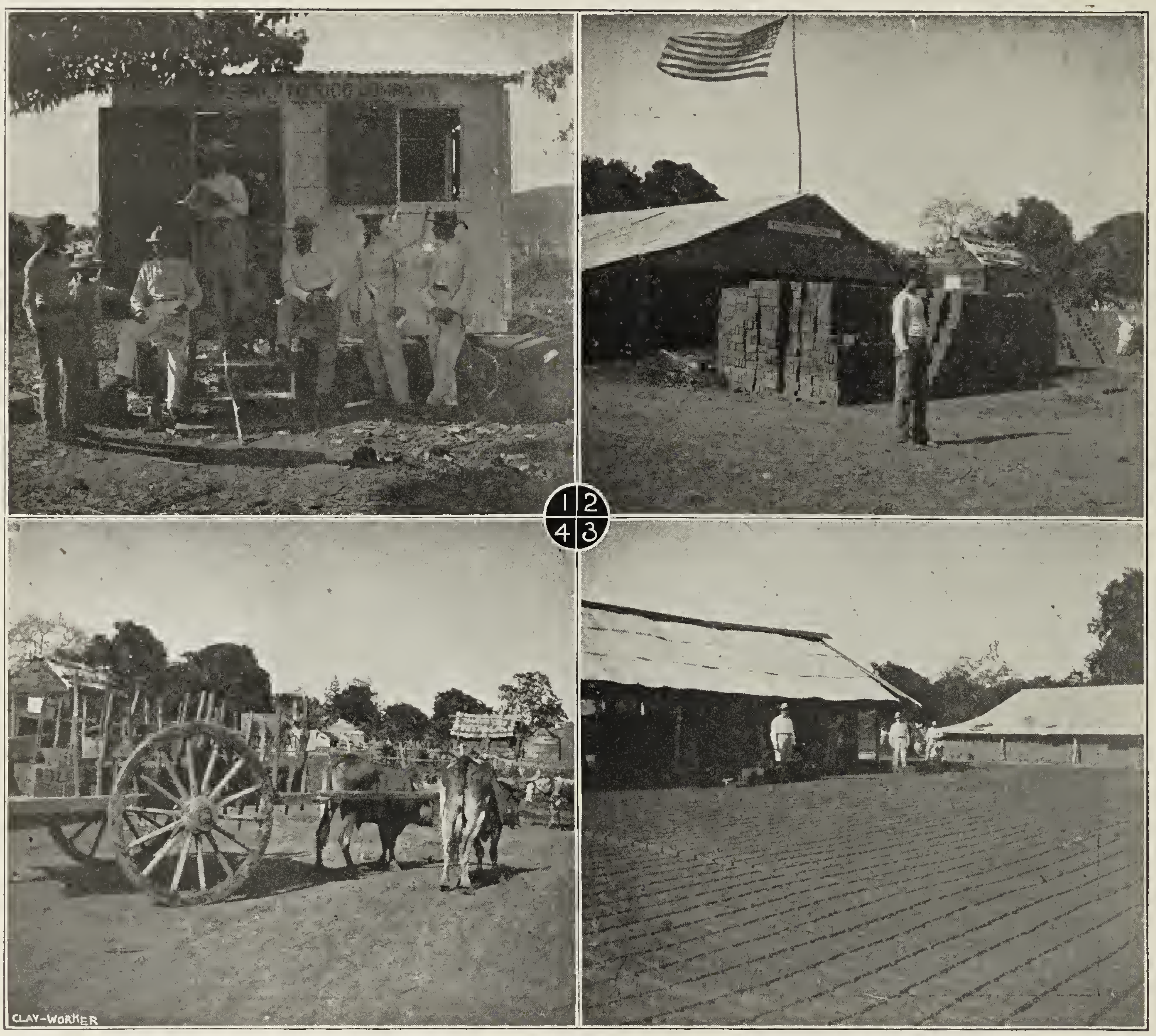
After the death of Mr. Toro the place was abandoned for quite a while, his family not being able to run the business successfully. It was then purchased by Mr. Carlos Chardon, and under the management of his brother, Pedro Chardon, it was brought into its present condition when taken possession of by the company. He made many changes in the yard, one of them being in the tempering pits, putting in a wheel drawn by two yoke of oxen. He also changed the method of burning, building two kilns, stationary bottom, arch high below the ground, one holding about 2,000 and the other 7,000. The burning was done by wood. The sizes were changed to ten by five by one and a half and nine by five by two and a half. The price ranged from $6 to $9 provincial money.

These were the conditions when Mr. William Barger, late of Philadelphia, assumed the management of the Puerto Rico Company. He at once changed the size of brick to the American standard, and increased the capacity of the yard from 4,000 to 10,000 a day, accomplishing this with the help only of native labor. Mr. Barger says the natives are very good imitators, and seem anxious to learn the American ways of working.

The clay is of the finest quality, turning out a first-class brick, and the quantity is practically unlimited for present and future purposes. The company is at present putting in a new plant of 40,000 capacity per day, using Chambers Bros.' latest improved machinery. The location of the new yards is directly across the road from the old one, adjoining a magnificent grove of cocoanut palms.

The machinery is being erected by Mr. P. H. Constable, of

Chambers Bros. Company. The work is being pushed as fast as possible in a tropical country and with the available labor. There is a great demand for brick at present, and the company is many hundreds of thousands behind its orders. Mr. Barger expects to have the plant in operation by the 15th of June and turning out brick fast enough to fill the demand.



Brickmaking in Puerto Rico. 1. The Office where the Clay-Worker is a Welcome Visitor. 2. Old Glory floats over the Old Yard. 3. Drying Hand Made Brick. 4. Native Delivery Cart and Team.

Written for the **CLAY-WORKER.**

BUTTON-HOLE TALKS.

"SAY! I'VE NOTICED you talking with a whole lot of bald-headed men, and I've been guessing as to when my turn was coming. The way I figure it out I am about due now. None of these fellows had any less hair than I, did they? Well, I'll start honest and own up that mine didn't drop out through early piety. Hold on! Don't shy! I've no horrible confession to make, but I will tell you right now that my religious training had a severe setback in my youth. It was sudden, all over in a minute, and the impression was irrevocable. It upset all the long droning, intoning, admonishing advice laboriously bestowed on me, absolutely destroying all its effects. It was simply an old-fashioned country 'hoss trade.'

"My uncle 'Zeke had a nag that was sweenied. The animal was a wreck—totally and unqualifiedly worthless except for hoofs and hide. He doctored and fussed with him, though, coaxing him along until the day my religious training got the shock. That memorable day old Deacon Jones, from over in Slab township, came along with a great, big-boned animal, and 'Uncle 'Zeke' bantered him for a trade. Little lad as I was, I listened with open ears and mouth, while my hair raised the flimsy covering of straw that adorned my head, and my legs warped as I stood, pigeon-toed, expecting to see him fall dead in response to sulphurous fumes from below. He explained to the Deacon how he loved that horse, and dare not tell his wife and family that he thought of disposing of it; how, gentle, kind and well broken it was; of what proud blood it was sprung, and that he wouldn't think of trading it but for the fact that he needed a heavier horse to draw out logs with. Then the Deacon took the floor, or the stump, or whatever you call it, and tuned up the praises of the large bundle of bones at the other end of his halter, saying that he was a wonder, and his staying powers were phenomenal, and that he certainly never would let such a valuable animal go, excepting that he was too heavy for his use, as he required a light horse for the road.

"Often had I listened, abashed, modest and terrified, to these men in the Methodist meetings, and now my spellbound tongue got dry and parched in my feverish lips and my eyes hung bulging from their sockets as I felt of my ears to see if they were really on straight and doing proper duty as I reeled from the awful lies of these idols—now brazen idols—of my boyhood.

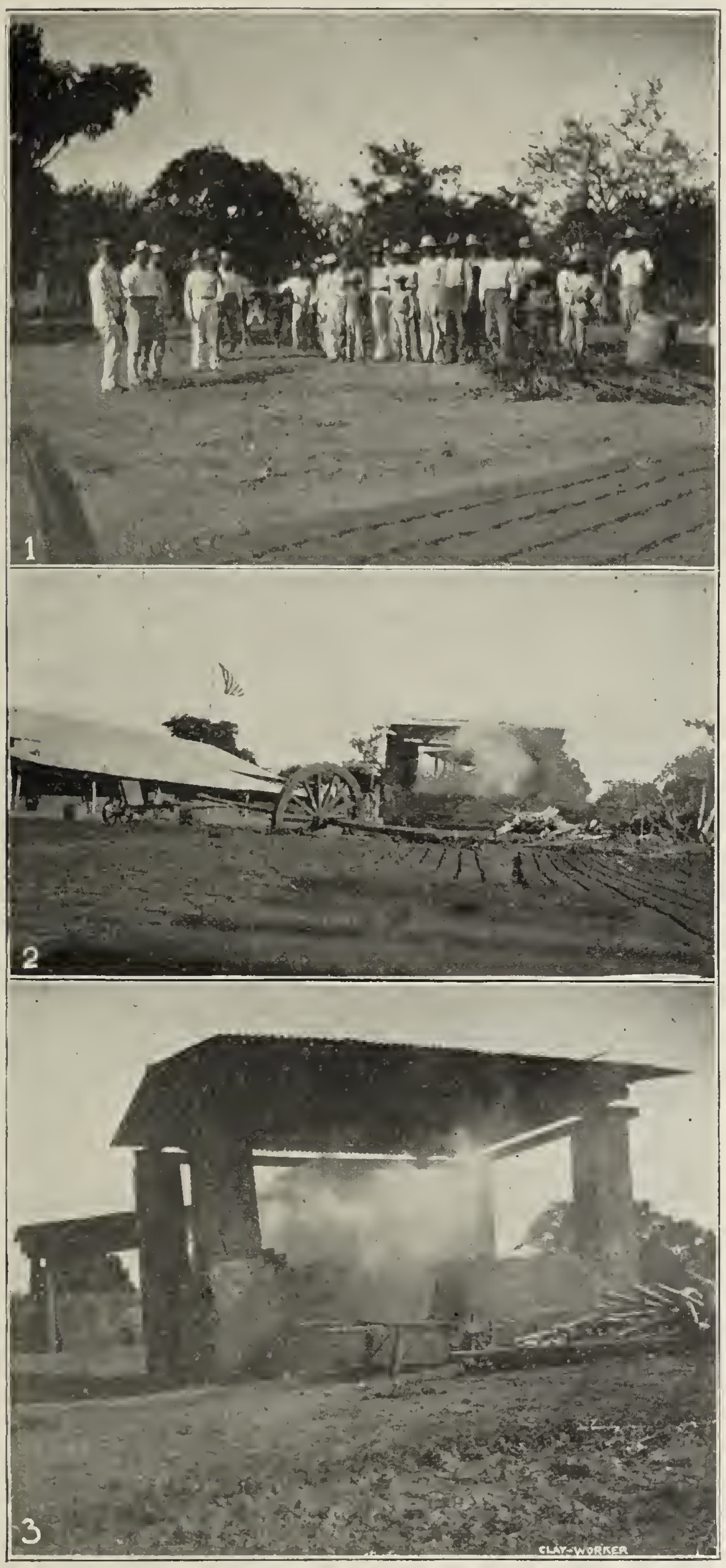
"The horses were exchanged amid pleasant banter, and the two chuckling old men led away their bargains.

"When the Deacon was well out of sight, Uncle 'Zeke, chuckling, hitched 'Ramese' to the log wagon, and shook the lines and chirped, whereat the horse slowly turned his head and looked at him, but never moved. I say never moved advisedly, for that was his strong point—his long suit. He might run away in pasture, or kick up and prance when loose, but, once hitch him up in a wagon, and there he was and there you were, too. His staying powers were the one thing the Deacon had truthfully described.

"I really always had a sneaking notion that the sad, injured look that 'Rameses' wore was caused by the remarks he had overheard between these two patriarchs, and that this look was fixed and kept on exhibition by the language of this patriarch now running the exhibition alone.

"I never knew—I never wanted to know—what the Deacon said when he got his relic home, but I do know that this shattering of my idols warped and twisted my whole life.

"No, Gates, you patriarchs want to remember that you are on exhibition all the time, and that the small boy notices you, not alone when you are on parade, but when you are off duty and off your guard as well." GATES.



BRICKMAKING IN PUERTO RICO. 1. Employes of Old Yard. 2. Dry Floor and Tempering Pit, Native Kiln in back ground. 3. Native Kiln.

Written for the CLAY-WORKER.

BURN LARGE KILNS.

BY D. W. STOOKEY.

IT TAKES ABOUT the same time to burn a small kiln as a large one. The time required to burn a kiln is not dependent upon the capacity of the furnaces to generate the necessary amount of heat, but it is dictated by the facility with which the wares will receive heat without injury. Each individual piece will require just so much time at certain temperatures, whether it be one of those in a small or a large kiln. Its capacity to receive heat is an individual characteristic, and not as one of a whole.

Possibly this should be modified somewhat to apply to the early stages when the moisture is being driven out, for then the dampness from the wares that are nearest the fires is moved first and may injuriously affect the cooler pieces farther from the fires as it goes past them in its way from the kiln. In general it is true that a large kiln is simply a greater combination of units and the size of the kiln may be increased indefinitely by multiplying the number of sections or spaces for holding wares and the corresponding number or capacity of the furnaces for generating the heat required to burn them. As each furnace burns independently of the others, it will be able to complete the work required by its section of the kiln within a certain time, regardless of the number of kiln units and furnace units that may be combined in the kiln, so long as each does its own work at the same time. Thus, by considering the kiln as a combination of space units with their attendant furnace units, it is easy to understand and believe that a large kiln may be burned within as short a time as a small one, so long as the relations between the kiln space or capacity of the kiln and the capacity of the furnaces is kept constant.

This is not only true, but, if I may use the expression, it is more than true. For the larger kiln has relatively less outside surface exposed from which heat is radiated and lost than the small one, and will become heated faster with the same proportionate furnace capacity than the small kiln.

Another argument in favor of the use of larger kilns may be found in the fact that there is a smaller percentage of lost and inferior ware around the sides of the kiln. The larger the space the smaller relatively the amount of outside exposure, with its attendant imperfectly burned and colored wares.

Large bodies of wares together in the kiln will give larger amounts of goods of the same degree of burning and the same shades of colors.

In building and planning larger kilns, greater breadth as well as length should be considered. It is easy to get heat enough to the center of the kilns. The difficulty is always in getting the heat to the ends and sides.

It would be the part of wisdom, then, to put more kiln into the center, more ware into the center, where it will be easily heated. Get all into the center that you can. Make the kilns as broad as they are long. Theoretically make them round, for the circle includes more space for the amount of boundary line than any other figure.

There is one item of expense in the burning of clay goods that does not receive the proper amount of consideration that it should. That is the exhaustion of body that attends the constant watch and loss of sleep of those in attendance upon the kilns.

One of the most common and oft-repeated rules for health and long life is regularity of habit in eating and sleeping. "Early to bed and early to rise makes a man healthy and wealthy and wise" sounds very well in rhyme, but it is a beautiful ideal that is beyond the possibilities of those who attend burning kilns.

The successful burner—that is, the one who makes burns with the least possible expense—must give his fires close and constant attention. The fires burn continually, and the condition of the furnaces is constantly changing, either growing hotter or colder. The most successful burners are those who steadily hold their fires at as high temperatures as the varying conditions of the kiln and progress of the burning will admit. As these best temperatures are different at different stages of the burning, constant watchfulness of the attendant is essential. This constant, watchfulness means constant wakefulness for some one, and, not only wakefulness, but the mind must be on the alert to know the condition of each fire when it is observed, what its changes are to be during the time until it can be seen again, and the method of treating it must be determined at each observation. There is not only wakefulness, but a certain amount of mental activity is required. This draws on the supply of nervous energy. In addition to this there is the physical labor required to handle the fuel and attend the fires, but perhaps the worst of all is the exposure in the night air during all kinds of weather. The man who gives the proper watchful care to his burning will almost unavoidably get warmed up enough at times to catch cold when he cools, and this, added to the other discomforts and drains upon his strength and nervous energy, will surely result in a weakened constitution and impaired health.

Having shown that a large kiln can be burned as quickly as a small one of the same class, it naturally follows that as many kilns will not be required to produce the amount of wares required for the season's output. If as many kilns are not required when large ones are burned, and, as large kilns can be burned as quickly as small ones, it follows that the total time required in burning may be reduced by the use of larger kilns. With the total time of burning reduced, the total loss of sleep, with its attendant exposure and loss of health and nervous energy are proportionately reduced, and the same amount of goods may be produced with less exhaustion.

These all show that large kilns burn more economically than small ones. Having a smaller amount of outside surface from which heat is lost, and near which inferior goods are produced, they have smaller amounts of loss in proportion to the amount of fuel they consume and the amount of goods they contain.

As the time required in burning is the same, and the loss of sleep, exposure and nervous exhaustion are the same for the one who carries the responsibility, the kiln that gives the most in results is the most satisfactory and economical.

Written for the CLAY-WORKER.

THE TRAMMEL FOR ROUND KILNS.

The FAILURE OF THE CROWN of a round kiln is indicated by the gradual sinking of one side and the upheaval of the opposite side. If the crown on one side is in a more direct line from skew back to apex than upon the other, it will have an advantage over the side of greater curvature, an advantage which is greatly increased and made an active force by the action of heat. Do not think that its irregularity in departing from a truly spherical form simply affects its appearance.

There are two features which must be embodied in the kiln to secure longevity—first, the crown must be a part of a true sphere, so that it shall be in equipoise and affected alike in all its parts by the action of heat; second, that the brick in each course shall have the same inclination toward the center of the crown. The angular space between the brick in each course should be the same. It does not appear to the writer to be good usage to lay an irregular course. We should either use a common form of brick or all wedge shaped; then all can be laid on the trammel, and the crown, like the wonderful "one hoss shay," will have no weak spot in it. No mason can lay a crown sufficiently accurate without the use of a trammel. No one should attempt it, and no proprietor should permit it to be done.

A very simple form of trammel, but which can only be used on kilns of small diameter, is shown in Fig. 1.

The center from which the arc of the crown is described on larger kilns is so far below the surface of the ground as to make this form of trammel impracticable with them. B is a step bearing for a revoluble gas pipe A, which has an upper bearing in a cross beam C. The cross beam is supported on posts outside of the full diameter of the kiln. The posts should be well set and stayed.

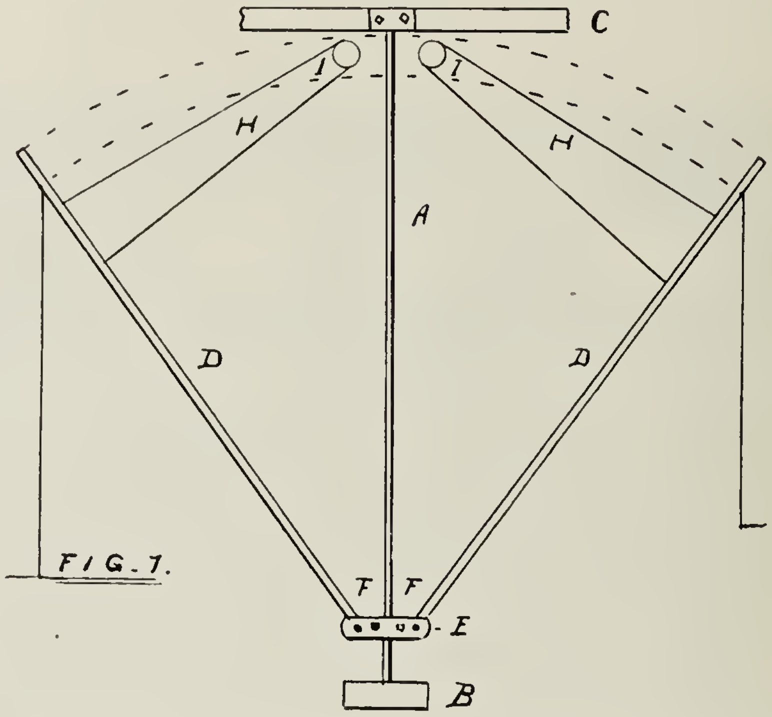


FIG. 1.

The sweeps D D are pivoted in a clamp E, which may be raised and lowered and be fastened rigidly by tightening the bolts F F. The sweeps are supported at their outer ends by cords H H running over pulleys I I. In laying the walls the sweeps are in a horizontal position. They may have vertical strips tacked to them to describe the inner and outer circles of the kiln. The trammel should be used for leveling the foundation and keeping each course of brick level. When the walls are complete the clamp E should be lowered to the center of the crown and the sweeps set in the position shown; then the work of laying the skew back and crown may proceed. Further details may be left to the judgment of a fair mechanic.

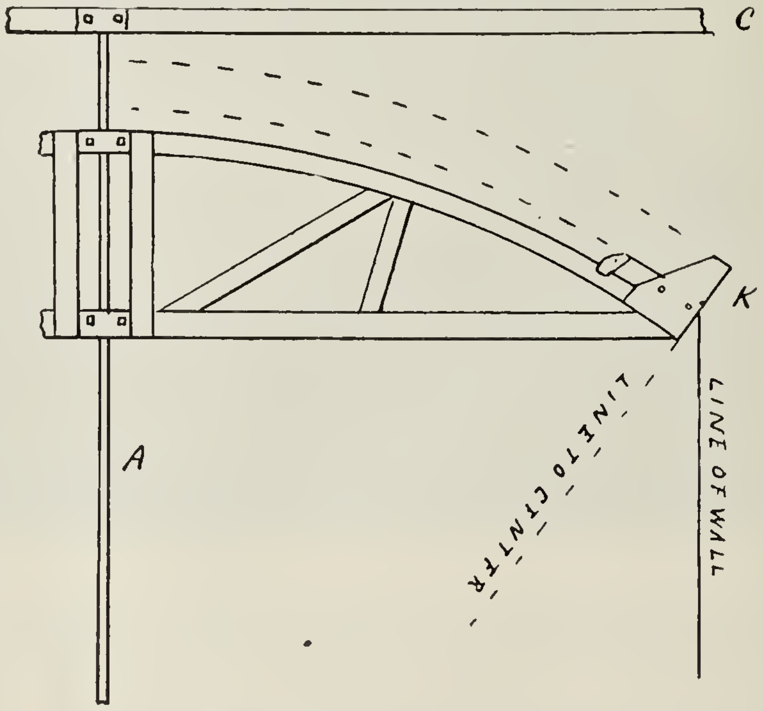


FIG. 2.

A better form of trammel is shown in Fig. 2. It has the same step bearing, cross beam, bearing in cross beam C and revoluble pipe A. The sweep is a series of segments held in position by cross ties, beams, etc. The segments should be described with a radius of four inches less than the crown. The sweep may be raised and lowered and fastened in any desired position by tightening the bearing bolts or by using an iron collar and set screw below the sweep on the pipe A. It is shown in position for laying the skew back. On the edge of the sweep are two riders K K, which may be moved over the edge of the segment or curved edge of the sweep and fastened in any desired position by small clamps. These riders are so made that the outer edge of each, in whatever position they may be in on the sweep, is on a line running to the center of the crown, or, to be exact, to a point one-half the thickness of the brick above the center. This form of sweep does not interfere with the scaffolds. It will be seen that the sweep cannot be bound in any way by the brickwork, for it does not touch it or come near it. The rider is, no doubt, a valuable improvement to the sweep, and is given to the trade with grateful acknowledgment of many favors received from them.

Written for the CLAY-WORKER.

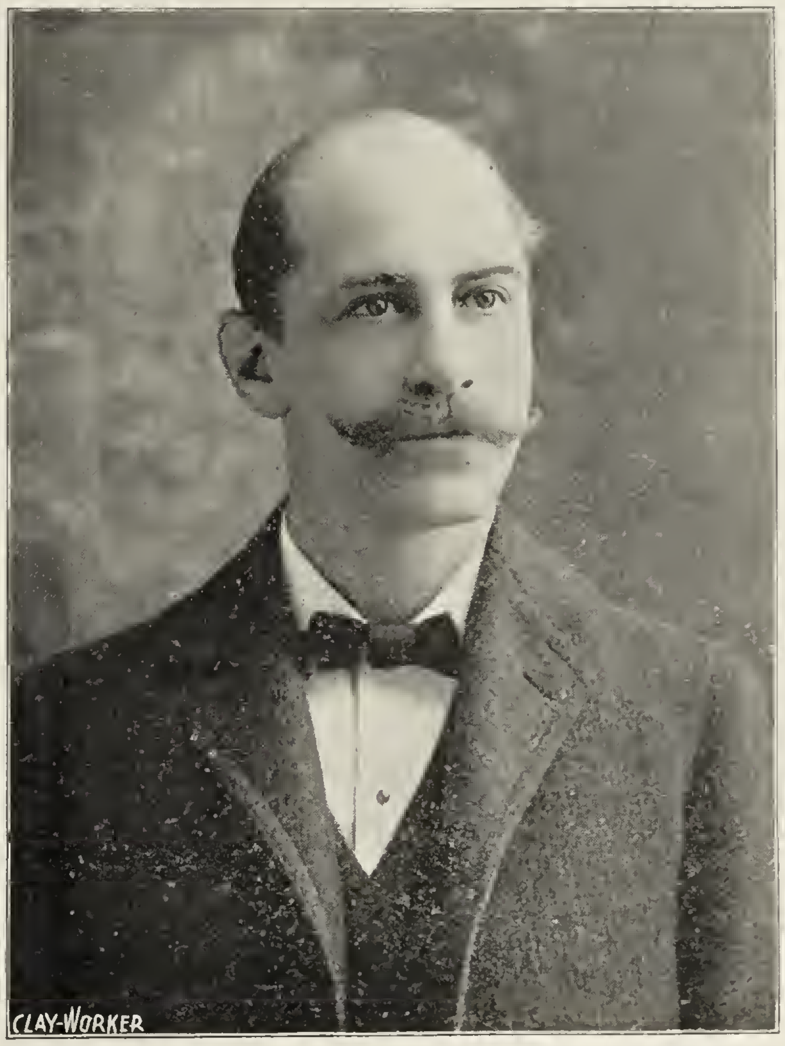
BRICK AND BUILDING AT THE NATION'S CAPITAL.

YOUR CORRESPONDENT called recently on Mr. Theodore Holbrook, president of the Washington Brick Company, and of the business organized last winter and known to some as the "Brick Trust," but which Mr. Holbrook emphatically states is by no means a trust. My desire was to get some facts concerning this "trust," and, talking with the able and affable president a short while, the required correct information was obtained.

The gist of the matter as stated is in the simple fact that Mr. Holbrook and others have formed a business for the purpose of handling the product of Washington brick manufacturers, an arrangement whereby the latter agree not to sell any brick themselves and to furnish their product only upon order from the selling company, which, being a capitalized, incorporated body, in turn agrees to find purchasers for the output of the brick factories, and to guarantee the seller against loss. The orders for material obtained by the selling company are divided among the various manufacturers according to the volume of their output, the largest factory of course getting the largest orders, and the brickmaker gets his money whether or not the sales company collects a cent from the purchaser. When collections are made the company gets a percentage for its services. So the Washington brickmaker is having an easier time than formerly, on account of not having to hustle for a purchaser and from the pleasing fact that what brick are sold bring $7 per M it is only necessary to keep the brick machine going—the selling company does the rest. That the manufacturer is fully conscious of this advantage is seen from the fact that out of the fourteen manufacturers in the District of Columbia nine have entered into the above mentioned arrangement. Of the remaining five, four make only handmade brick, and the fifth, according to Mr. Holbrook, is not in an overhealthy condition. Another evidence of the value of the selling company and of the fact that it is not a trust is that the Washington Hydraulic Brick Company disposes of its material sold in this city through this agency. The Hydraulic Company, which has no competitor here, is doing much through its product to beautify Washington. Its (front) brick can be seen in colors of red, brown, gray, pink, buff and others in many parts of the city, and its output of 12,000,000 to 15,000,000 a year finds a profitable market here and elsewhere.

This company has its plant in Virginia, not far from Washington, and in this State are other brick works which supply material for buildings, etc., in the capital. Virginia furnishes a great deal of fine clay for this purpose, among this being an excellent quality of chocolate colored variety found not far from the long bridge which crosses the Potomac river. Perhaps few know that as far back as 1649 Virginia clay was employed in that State in the manufacture of pottery, but such is so. At that date a number of small potteries did a good business. Of course, there was very little exporting from this early American industry, and the products of the factories were used principally at home, and not in distant towns, but the fact shows that the American potter was early in the field. And it is safe to assume that the brickmaker antedated the potter as an American clayworker, for the simple reason that shelter was a first necessity, that clay and fuel were abundant, and that there was great cost and long time consumed in shipping brick from England to the colonies. Besides this there was the additional expense and time in conveying such freight to inland places.

Another Virginia enterprise, with headquarters at Washington, is that of Kendall & Flick, a firm well known to the readers of The Clay-Worker. They operate a large manganese mine at Elkton, Va., and report trade in their line very satisfactory. Manganese is used extensively by the manufacturers of front brick and terra cotta. Work at their mines and factory has increased recently to such an extent that double-time labor is required. They are shipping manganese to all parts of the United States and Canada and also to Mexico. Mr. Kendall, the senior member of the firm, is a member of the N. B. M. A., and a very genial gentleman, as the reader may judge from the accompanying portrait, as well as a very energetic business man. He is a native of Washington, where his father was engaged in business for many years.



J. B. KENDALL, Washington, D. C.

—Revival of Old-Style Architecture.—

In the olden times, when our colonial forefathers were building their quaint gabled and dormer-windowed houses, using brick, which for many decades ceased to be considered in architecture, those "ancient" people little thought that their ideas in this respect would fail to obtain, and then late in the nineteenth century arise again to claim attention of far advanced people. But in the residence districts of the Nation's capital we find the pre-revolutionary idea in brick and in architecture meeting our gaze in numerous handsome and in many instances palatial structures, evidencing the renaissance of the old-time idea. A new feature in this particular is shown in a residence now under construction here, in which the brick (red) are being laid after the style known as Flemish bond; at least it will to some extent approach Flemish bond. This in colonial days often gave the house thus built a checker-board appearance, due rather to utility than to a desire for ornamentation.

The pre-revolutionary brickmaker usually burned his brick in clamps, being piled on edge, with a half inch space between the brick, and forming their own kiln. In this wood fuel was used, which caused much smoke that blackened the exposed ends of the inner tiers of brick, which were also partly vitrified. The intermediate ones were well burned, but the outer tiers were only partially hardened. But all the kiln produced was used. The soft brick were put inside, and the black ends employed in the outer face of the wall. In laying their brick the old-time masons alternated with binders and stretchers, giving full length to the red and end presentation to the blackened specimens.

The apartment house and office building continue to add their quota to the city's improvements. One of the latter class, to be built at the northwest corner of Sixth and D streets, northwest, will occupy the site of one of Washington's oldest buildings, which began its history about a century ago. This ancient landmark (only recently torn down) was a three-story, barn-roofed structure of red brick, which in its long and useful life has had much to do with many people of note, the majority of whom have long since crossed the Great Divide into the unknown country. In the old house famous congressmen and members of the diplomatic corps found good cheer, for it became a hostelry where the cuisine was of the finest. The building site thus occupied was part of the farm of David Burns, who seems to have owned most of the land upon which the city was built, and, although this old Scotchman was so well off, he lived in a little frame dwelling, while his son-in-law, near by, lived in a lordly brick mansion.

In regard to frame houses in large cities, I do not think there is a city in the United States possessing the general beauty and the incongruity in so many of its structural features. The frequent occurrences of little ramshackle houses (often occupied by negroes) on the finest residence streets, and often nestling up against brown stone and brick mansions, is something which forcibly strikes the visitor at the capital of our country. Of course, there is a law against building wooden houses in Washington, but the owners of such, when they are located on valuable ground, seem to be more willing to live in a shanty in a fine neighborhood than to sell their property and live more comfortably in a less aristocratic place. The time that it takes to weed out wooden houses from a brick city, even where the brick product is abundant, is beyond the calculation of man. But this city is progressing architecturally and in its system of street railways, which have so much to do with building and material for this purpose.

In a few weeks all the principal street railroads here, excepting the Belt line, will be operated on the underground electric system, and the Belt line will follow this in due time. A number of these roads have suburban extensions, shifting from underground to overhead trolley at the city's boundary, and thus traveling several miles into the country. An interesting feature in connection with the railway system of Washington is that which concerns a new source of electric power for operating its greater portion. This will be obtained from a power plant located at Great Falls, fourteen miles from the city, where electric energy to the extent of about 30,000 horse power will be generated by water power. This should be sufficient to run all the street cars and to furnish current for lighting the city.

Work on street roads here has given employment for some months past to a large number of laborers, as has building enterprises, the latter consisting mainly in the smaller sizes of brick houses. While several large buildings are in process of construction in various parts of the city, there is some falling off in this respect, owing to the scarcity and increased price of material, especially iron, which enters so largely into the fireproof quality and strength of the big modern house.

Apropos of iron and safety in large structures, I recently had an opportunity of examining a building situated near this city and intended as a home for a religious brotherhood and also as a theological school. This building, now nearly completed, is about 200 feet long by 50 wide, is four stories in height, and is composed of a white sandstone front and plastered brick sides and back. Outwardly this edifice looks substantial enough, but on going inside I was struck with the evident false economy in the great amount of wood in sight—floors, joist, studding and window frames all wood. The place is a perfect fire trap, which, by the use of iron and tile at a little greater expense, would have been practically indestructible. With the means that the clayworker and the iron manufacturer have placed before the architectural world for its safety, there is little excuse for fire horrors in buildings in this day of knowledge and progress. NICODEMUS.

Written for the CLAY-WORKER.

WHAT KILN SHALL I BUILD? No. 6.

HAVING HAD OUR SAY about kiln walls and crowns, we next discuss, as in due order,

—Kiln Furnaces.—

We are reminded as we approach the subject of a must-be "true story" that appeared in Harper's Magazine "drawer" a quarter of a century or more ago. It was an illustrated story in which two fops were presented, each with an enormous bow to his necktie, much in vogue in that day. "I say, James, how do you manage to secure such a perfect gem of a bow?" asks George. The answer comes: "Well, you see, George, I give it my whole mind."

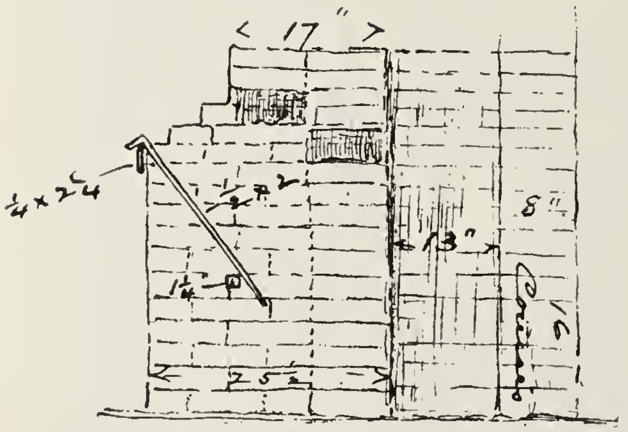


Fig 1.

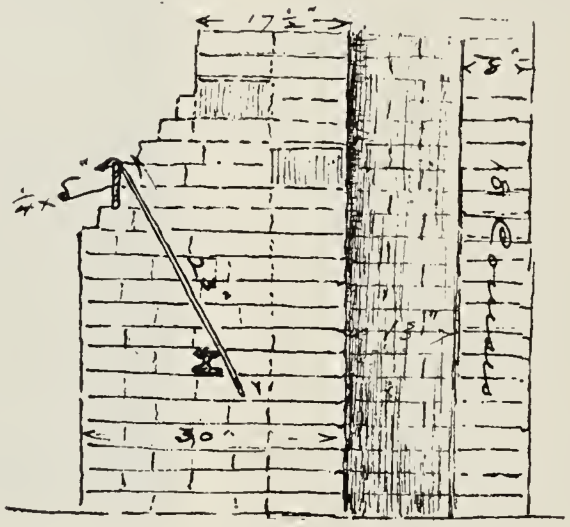


Fig. 2.

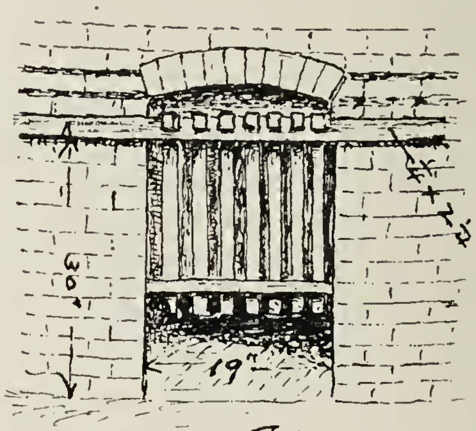


Fig. 3.

Now we are aware, as our readers will become, that we have not given the subject our "whole mind." The treatment of a kiln furnace is worthy of a specialist's pen, and this we cannot claim to be. We have been bold to recommend to readers of The Clay-Worker a certain type of kiln for certain classes of work, and as the months have come and gone since this recommendation was made, and many kilns in different sections of the country have come under our observation, we have been confirmed in our opinions. We are not prepared to take the same course in the matter of furnaces. The conditions are so various and the fuel so different that due regard must be had for these differences, and to one who to-day is building new kilns or desires to improve an old one, not being satisfied with past attainments, we would say, ascertain what is being done by others in similar lines of production and with fuel of a similar character, and profit by others' experience, where the results attained are such as to warrant.

The man who as superintendent or manager of a clayworking plant depends wholly upon following his neighbor's example, however, no matter how good it may be, is a "poor stick," and wholly unfitted for his position. We were recently looking over an extensive Ohio plant which was under the general management of a gentleman who had been, until assuming charge of the plant, a merchant. We found the kilns employed were those of a well-known kiln builder, but in the course of years they had been so changed, especially as to furnace construction, that the builder himself would hardly own them, and the changes had greatly increased their efficiency and value to the owner. They had simply adapted them to their fuel and clays. Another instance has recently come to our notice. Some thirty-foot round down-draft kilns, employed in burning shale pavers, which were built originally with ten furnaces, had been reconstructed as to the layout of the furnaces, so that eight fires were doing the work which ten had previously done, and at a saving both of fuel and of kiln space and labor, and with as good or more satisfactory burns. These parties had copied no one. They had simply become convinced by careful observation that they could dispense with two furnaces and the wear and tear attendant upon them and their bag walls, and had proved in practice the correctness of their judgment. The clayworker who should witness these results, and at once jump at the conclusion that he could make a like change in his kilns, would be very likely to make a mistake. He should first ask himself the question, "Can my clay be burned as satisfactorily under the same conditions, and is my fuel likely to be as effective?" If there is doubt as to the first question, the prudent way would be to send a half dozen or more of his own dried brick for scattering about in such a kiln with reference to securing a practical answer. We are inclined to think that such changes may be made in a large number of cases to the decided advantage of the kiln owners, but it would, perhaps, mean that each individual furnace should be kept in its best condition and be handled in the best manner, but all this care and attention ought to be taken for granted. No doubt slovenly handling often makes the demand for extra fires, and, of course, an equally great increase in fuel expenditures. We recently inspected a plant in which eight firing places were found in each twenty-four foot kiln. This would be equivalent to twelve fire holes in a thirty-foot kiln, but we could see why the eight fires were needed under the system (or rather lack of system) of firing represented. Near the top of each fire bag was a peep hole representing the cross area of a brick, including mortar joints—say an opening through the kiln walls 3x5 inches—and in a majority of cases our observation told us these peep holes were left either partially or wide open during all stages of the burn. The many thousands of cubic feet of air taken into these kilns every hour to absorb and carry away the heat which should have been made effective for burning the wares seemed not to have found any place in the calculations of the burner, who, evidently, was not of a calculating makeup. On calling the attention of the superintendent to this source of waste we were advised that he did not like to interfere with the burner's duties.

There is one prevailing form of furnace in use in round down-draft kilns aside from which all other forms may be considered as exceptions to a general rule. We have often wondered that it should have maintained its popularity in this age of improving upon old methods. It is certainly open to the objections of being both wasteful and unscientific. In saying this we have in mind the fact that it is only within the past three or four years that so high an authority and so careful an observer as Professor Orton has in the columns of The Clay-Worker practically conceded to this form of furnace the place it occupies in the clayworking industry as merited by its performance. We give in Sketches 1 and 2 cross-section views of this style of furnace, Fig. 1 being of a twenty-four-foot diameter of kiln constructed for hollow block and fireproofing purposes, and Fig. 2 of a thirty-foot diameter of kiln used for paving brick purposes, each being well suited to its work.

In Fig. 3 a front view is presented of the furnace shown in Fig. 1, the width of the furnace being nineteen inches as shown, and the height to top of grate bars about thirty inches. The shaded brick in Fig. 1 show the fire arch brick which are sometimes carried down as shown to make a second and lower arch, with a view of preventing the entrance of too much air above the grates and also of bringing the air in contact with the live coal, thus securing more perfect combustion, while preventing carrying into the kiln an unnecessary quantity of air—that is, more than is actually necessary for the process of combustion. This lower arch is indicated by the dotted line in Fig. 3 also.

We have sketched this style of furnace or fire hole and grate in what have seemed to us to be as well planned and proportioned as any that have come under our notice, the dimensions of the iron band, the furnace bars and supporting bar being given and the number of courses of brick also being shown. The fire bags as we have shown them also represent what we have deemed the best practice. It is most common to lay up the fire bags in fire clay mortar to the whole height of the bags, but our own preferences are to dispense with mortar above the point at which fuel is likely or liable to come in contact with the bag wall. In walls so laid there is less liability, indeed none, to the large cracks and fissures to be seen in so many bag walls, and the dry wall can be counted upon to maintain its integrity against anything but careless knocking or banging on the part of kiln setters or clearers. If disarranged from any cause, a few moments serve for resetting.

We have said that notwithstanding the fact that this style of kiln furnace is so generally accepted that we consider it both wasteful and unscientific. Any one who has spent much time in a kiln yard where such kilns are under fire knows that usually at every stage of the burn clouds of unconsumed carbon are common, emanating from the fire holes, and especially so during the earlier and later periods of the burn, and the volumes of smoke are greatly increased in case of winds or even a light breeze, and all know that these volumes of unconsumed carbon carry much heat with them, and are in themselves a visible measure or indication of fuel loss. In the early stages of a burn, before the heat of the fires has reached the point of incandescence when the draft is insufficient to supply enough oxygen for complete combustion, more or less of loss must occur, but this may be considerably decreased by drawing the air supply through the burning fuel in the early stage, instead of allowing it to pass over it, thus choking the draft and hindering combustion. Were we running a plant to-day, and were our kilns supplied with furnaces of the character under discussion, we would certainly attempt, and we believe we would succeed in remedying in large measure the evils alluded to, by supplying our fire holes with hinged covers, to be used or not used, as circumstances and conditions might require. A simple way of providing these would be to place a band of iron—say ¼x2 or 2½ inches—about the kiln at a point where it might rest upon the upper projecting course of brick laid at the top of the fire holes. This band would simply serve to hinge the covers of the fire holes to, wrought-iron eyes being riveted thereto to receive the hinge rod or pintle. To make our method plain we sketch in Fig. 4 such cover in position for use, and in Fig. 5 the cover when not in use or when fires are being fed. In the use of such covers fires could more easily be kept under control during the prevalence of a wind, and these covers, which answer the same purpose as furnace doors, might further be supplemented by screens of sheet metal to hang from the kiln band supporting the upper end of the grate bars, and so inclosing a portion of the ash pit. A set of screens made of varying lengths, to accommodate the varying conditions of wind and weather, would go far, if used intelligently, towards controlling and modifying those unfavorable conditions which often result in the over or underburning of one side of a kiln. We show such a screen in Fig. 6. The cover and screens may be made of such thickness of wrought iron as may be deemed best. Our judgment is that a tank iron one-eighth inch in thickness would be about right for the purpose. Let us give our reasons for the opinions we have expressed.

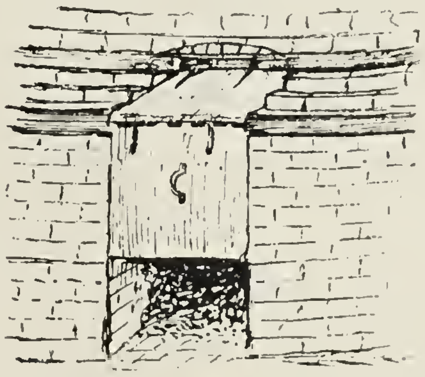


Fig. 4.

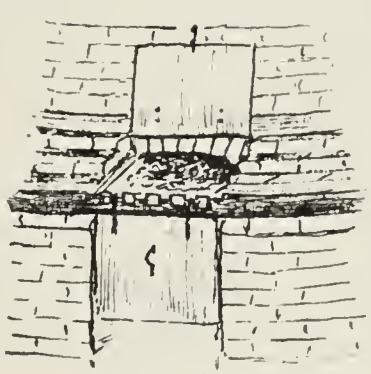


Fig. 5.

Discussing with an intelligent and able manager the advantages of a kiln furnace with doors of the usual type—that is, a cast-iron door hung in a cast frame, set vertically in the furnace wall and opening upon an horizontal grate—he told us that in making the change from the ordinary method of construction we have been describing he had made a handsome saving in his fuel bill, which, as we remember, was about 10 per cent. Such change was attended with no little expense, requiring the extending outwardly of furnace walls to secure room for needed length of grate, etc. This expense would, no doubt, deter many, and yet in this case it was shown to pay.

By the comparatively simple method we have proposed, which involves little cost and saves to the user the cheap pitched grate bar and the supposed advantages and conveniences attending upon the use of such bars, there can be secured also all the benefits arising from the use of the closed furnace, such as the closer regulation of the air supply and protection against varying weather conditions, also the saving of no little loss from the external radiation from exposed fires, all this without requiring the burner to make any radical changes in his methods of firing, save to use reasonable judgment in the use of his covers and screens. One beauty of such procedure would be that no change in masonry would be required, no building out of furnace walls, etc. The chipping off of the edges or a portion of the corners of the brick abutting the fire hole, say an inch or more on each side, to make a shelf on which the two sides of the cover might rest, and then the laying of a brick on each projecting course abutting the fire hole to secure a reasonably close joint for the cover, for the exclusion of air, would meet all requirements in the masonry line. If parties would like to test this plan before deciding upon permanent arrangements it may be done in the following manner at a cost of not over $5 to $8 for a kiln: Make a set of covers and screens from, say, sixteen-gauge black sheet iron; cut the covers large enough to lap an inch on the brickwork each side of the fire opening and to turn up, say three inches, to rest against the kiln wall and cover the arch opening in the wall; rivet a strip of iron, say, one-eighth by one inch, of sufficient length to turn down, and, passing between grate bars, engage with the inside of the band supporting the bars, so answering as a stop to hold the cover in position. Cut screens from the same thickness of iron and supply with hangers; lay bricks upon the projecting courses, as before described, to insure a reasonably close joint and for the exclusion of air. In recommending this we are aware of the difficulties a manager or superintendent often meets in the indifference and frequently in the opposition of his burners to any "new-fangled notions." It will as a rule, no doubt, require the personal attention and following up of the superintendent in order to arrive at any safe conclusions concerning the value of the improvement. The test cannot, of course, be made until the superintendent has accurate information concerning the amount of fuel used in the several previous burns, and the test of value should not be confined to a single burn, but to several. The superintendent should know certainly—as he may and will if fitted for his position—that his plans and requirements are being carried out faithfully both night and day. We are not discussing an immaterial or unimportant proposition when we treat of the saving of fuel. We have recently visited works in which, in the one case, one pound of fuel was used for every four pounds of clay burned, and another in which similar wares (shale pavers) are burned with not over one pound of fuel to five of wares. The plant of the first named was, in theory, the better of the two, and to our mind the difference was very largely in the management, the holding to account, the following up of each kiln in so systematic a way that if a half ton more of fuel was used in burning a kiln than usual the weather or the burner was expected to account for it. It helps wonderfully to have a system by which each employe knows that his superintendent can with accuracy measure his performance, both its amount and its quality, and in the case last cited the manager's office contained a record of daily performance in each department of labor, and of the quality and quantity of the results, that rendered him master of the situation.

We were at works a few days ago where coal was shipped in from distant mines, and where 1,500 tons per month were being consumed. It made no little difference with the owners whether four or five pounds of wares were being burned with a pound of coal; in this case the difference would have been three hundred tons per month, or ten tons per day. So please don't dismiss our suggestions of savings in fuel as unworthy of your consideration, if you are interested in the burning of clay wares.

"Like master, like man," is an old adage. The superintendent or manager who has a man who is not willing to heartily co-operate with him in his efforts to introduce economies cannot do a better thing than to "weed him out." We have fallen upon times, after years of struggle, in which all are telling of prosperity, and we are likely to forget some of the lessons we should have learned in our near six years of hardship. We yesterday saw an iron furnace (a modern plant, but unfavorably located for sharp competition) which had been idle since 1892 or 1893. It was in full blast. The time had come in which the demand had increased the market value of its product until it could run with a margin of profit in its favor. Now the handicap of bad location was to this iron plant what slovenly management is and may be to a clayworking plant. Money can be made by it only in flush times, and it shuts down to save loss at seasons in which more skillfully managed plants, with no better facilities, are running at a profit, the difference being in the savings. Take the case of the plant last mentioned by us. The difference between four or five pounds of wares burned with one pound of fuel would mean in a year the nice little lump sum of about $5,000, and you may be sure that the management that would permit of the loss or waste from such source would permit also of an addition of an equal amount of loss through other channels connected with the running of a clayworking plant.

In hard times the management of a clay or any other manufacturing plant is burdened with the question of finance and of difficulty in the way of disposing of product, making collections, etc. Let those who are, by the approach of good times, relieved of financial cares apply themselves to the problems of more thorough organization, and a more careful utilization of the raw material which comes into their hands to be shaped and fitted for the market. We are aware that the reverse of this course is the more likely to follow; that good times are more likely to breed even greater carelessness on the part of those already careless; but it is a good time to make the suggestion to the thoughtful. The old adage, "In time of peace prepare for war," is applicable to the present, for the time is sure to come in which we are to have other object lessons of the "survival of the fittest." FLAME.

Written for the CLAY-WORKER.

CHICAGO PAVEMENTS—PAST, PRESENT AND FUTURE

Third Paper.

TO THIS POINT our observations concerning brick pavements laid in this city have been confined to those laid upon sand and gravel foundations, with the exception of a small patch laid upon the refuse of a lumber yard. We now come to notice a stretch of about one mile of pavement laid upon an old macadam foundation which had been patched and mended year by year until it had become quite reliable as a foundation. This stretch is about two miles in length, and is that part of Wentworth avenue running from Fifty-fifth to Sixty-third street. This is a busy marketing street for that section of the city, the character of the traffic comparing well, we think, with that of the main business street of a city of 25,000 to 30,000 people. This old macadam roadway was regraded and covered to a depth of about two inches with sand, upon which repressed Galesburg brick were laid in the usual way, upon edge, and a tar filler was applied. The present appearance of this pavement, after years of service, indicates that a good, thorough job was performed. A careful inspection of a half mile or so of it failed to show anything in the way of a settle at any point or any appreciable wear upon the face of the brick. While we have referred favorably to the common square-edged brick made by the Galesburg people laid elsewhere in the city, we could not but observe quite a difference between the two when the comparison was made, the rounding corners of the repressed brick presenting a clean, straight edge, as against the nicked edges of the square brick. We are advised that not a dollar has been expended upon this pavement since it was laid, and if the half mile or so of it which came under our inspection is a fair sample of the whole, as no doubt it is, it seems safe to predict that the contractors will, without any demand being made upon them for repairs, see it pass into the city's care in excellent condition for further years of service. A section of this street is shown in one of the accom-

Wentworth Avenue, Chicago.

panying engravings. It will be noticed that granite blocks were used in paving between street car tracks, of which there is a double line. We noticed no lines of special wear upon the brick in consequence of the wheels of vehicles following the grooved rails.

This experience of laying a brick pavement upon an old macadam foundation, and with such successful result, is likely to bear fruit in the future for the paving-brick maker to gather. When we remember that the close of this year will find in Chicago about 390 miles of macadam, it will seem to be in due order of things that, as these streets take on new importance and the building improvements warrant, such oft-mended and dusty roadways will call for a covering of brick, as in the case we have been considering. The worn and consolidated macadam seems to be the half-way stage of the proceedings, and the other would seem quite sure to follow. These macadam roadways are laid either upon sandy or stiff clay sections of the city. The black, mucky soil of the prairie, on which the eight hundred miles or more of wood block pavement is mainly laid, has a way of submerging macadam which renders the undertaking unsatisfactory and expensive, hence the recourse to blocks, which, as we have before stated, cost about the same as the broken stone roadways.

Among the first streets or avenues paved with brick, laid on a concrete foundation, to be found in Chicago, we may mention Ogden avenue, which is to the west side of the city much what Wentworth avenue is to the south side—a street largely given up to retail business purposes. It commences at Randolph street, and runs in a southwesterly direction, crossing Madison street, which may be denominated the main artery of the West Side and given up to business purposes, two blocks from its starting point. This pavement presents a very handsome appearance, as far as the brick are concerned, but as there is a double street car track, between the rails of which granite blocks are laid, the street, as a whole, loses much in general appearance. The same condition exists in many parts of the city. The photograph of Wentworth avenue shows it to be a feature of that avenue also. These granite blocks were laid by the street car companies when horses were employed for moving the cars, and were no doubt laid long prior to the advent of brick on these avenues, and will no doubt long remain to detract from the good looks of the streets, being shunned by those driving on the street, the brick naturally being given the preference. We find nothing to criticise on this avenue so far as it relates to the brick portion of it. The filler used was tar, and we have noticed that the joints of a tar-filled pavement are more open—that is, not as well filled to the surface of the pavement as sand-filled sections. This is accounted for by the fact that under a hot sun the filler softens and runs into the gutters, where we have seen it accumulate in successive wave-like formations. The sand or dirt of the street does not adhere to it, and hence the cracks or spaces between the brick remain practically but partly filled, one of the results being a more pronounced rattle attending the passage of vehicles than in the case of a good sand filler. At any rate, such are our conclusions after a careful study of the matter. It may be well to state that the "tar filler," as it is denominated and used here, and sometimes by courtesy called asphalt, does not become hard after months, and even years, of use, where not exposed. I am informed that on taking up sections of pavement laid a year or two before, this tar filler was found in a green or viscid condition; but our observations concerning asphalt fillers, so named and used in other cities, is found leaving the joints and accumulating in the gutters as here. Evanston avenue has a half mile of brick pavement, with Murphy grout filler, and it shows practically no wear. Chicago has so far employed no cement filler; only sand and tar have been used to date, so far as we can learn.

Ogden Avenue, Chicago.

Odgen Avenue, Chicago. Wood Block Pavement

—An Object Lesson.—

We present two views of Ogden avenue pavements, the first, of a section lying immediately south of Washington boulevard, being of brick, and the other, immediately north of the boulevard, being cedar block, though the picture itself furnishes no indication of the material used; neither would a careful examination of the pavement, unaided by a hoe or other implement. At the time we first visited these pavements, in the month of May, the cedar block section was one continuous mud puddle, and an unpracticed eye would hardly have detected any indications of a pavement. The photograph was taken six weeks later, when a June sun had dried out the mud and the traffic of vehicles had served to level the surface. But to our object lesson. The residences lining the east side of this block and north of Washington boulevard are, as the photograph shows, a good character of stone front dwellings, and the location is exceptionally fine, fronting, as they do, one of the prettiest small parks in the city, a view of which, taken within a stone's throw of the section shown, is presented to the reader. This section is reached by an elevated electric road, a block distant, that will transfer one from the business center of the city in about ten minutes, and is also reached by various sur-

Union Park, Chicago.

face car lines only a block away. At the time of our May visit five out of seventeen of these dwellings were standing empty, with "To Rent" placards in the windows. Looking south from Washington boulevard, on the north side of which the dwellings in question stand, we strike the brick-paved section. In this block, also facing the park, we find fourteen residences and a church. All but one of these residences were occupied. They were of no better character, hardly as good, and, being nearer to Madison street, a busy thoroughfare bounding the block on the south, are hardly as desirably located. We were convinced at the time of our May visit (the May moving season having passed) that the condition of the street, unwholesome and uncanny, was responsible for the vacant houses, or largely so, as we would ourselves have passed them by on this account. A few days since, mid-June, we took our photo. Three of the houses were still vacant, and, the renting season having passed, may long remain so. A well-paved street is a source of revenue to a real estate owner, is the moral that may be drawn. The Ogden avenue brick pavement has been selected because a long, and hence important section for reference, as is the Wentworth avenue section. Many handsomer sections, not traversed by street cars, would make finer pictures, if this was what we were seeking.

Milwaukee Ave., Chicago.

We now turn to an object lesson of quite a different character, though we shall not find in it the satisfaction we have found in the presentation of other pavements mentioned. Milwaukee avenue is a main artery, we may say "the" main artery, of the northwest section of the city. Starting from the junction of Lake and Canal streets, just west of the river, and running northwesterly, it reaches, in passing the length of a block, a network of railway tracks, which are crossed by a long viaduct covering twenty of them. Another viaduct of similar character converges with the Milwaukee avenue viaduct, and the two unite on the north sides of the track system. The avenue from this point traverses the edge of a heavy manufacturing and dock district lining the north branch of the river, and, being the best paved street of the district traversed, it results in the concentrating upon it of the vast traffic of that busy section of the city. Great freight depots border the railway tracks, coal and lumber docks and large manufacturing plants line both railways and river, and, besides this, perhaps 300,000 people do their principal marketing and shopping on the line of this section of brick pavement running from Lake street north to Chicago avenue, about three-quarters of a mile, we judge. On this busy street brick is having its hardest testing in Chicago, and the test is being made at a decided disadvantage. We do not know whether the contractors or the city are responsible for the fact that the earth has settled to the width of several feet, on the west side of the street, for the entire length of the pavement north of the viaduct. It seems that a water main had been laid a little previous to the paving, and the earth had been laid a little previous to the paving, and the earth had not fully settled about it. The foundation for the pavement was of Portland cement concrete, laid six inches in thickness, which, if properly laid and of good material, in proper proportions, evenly mixed, and then given time for setting before using, should have insured better results than are to be seen by inspecting the pavement to-day. It is quite evident, aside from the sag of pavement over the water pipe, that the foundation, in places, was insufficient. There is no other way of accounting for depressions aside from those which too frequently occur as a result of tearing up a street to reach water and gas pipes, etc. In places there may be seen lengthened depressions, running parallel with the street, which cannot be accounted for by any wear of the brick, and to us it seems impossible to account for this on any other hypothesis than a yielding foundation. Whether this occurred while the concrete was yet insufficiently hardened, or whether because it was poorly mixed or not properly compacted, a careful examination by a removal of a section of the pavement at points in question should determine. As there are stretches of the pavement which are subject, and must have been subject, to the same conditions of traffic which wrought injury at points immediately adjacent, and which have not been injured, we are shut up to the conclusions we have presented. All know that what may be called the normal wear of a paving brick is many times increased by the shock and grind of traffic when it is but partially supported by the brick about it; that a smooth, even surface has only to support a rolling weight, while a hollow or depression brings distinct shocks or blows of wheels, and, at the same time, heavier and sharper blows from iron-shod hoofs, while any turning of wheels from a practically straight course, when on an uneven surface, results in what may be fairly denominated a grinding action. We do not think the manufacturer of the bricks which are laid on this avenue furnished anything to be ashamed of; but many of them are being subjected to the tumbling barrel test conditions, and the contractor who laid the pavement will no doubt be called upon to do some work in the way of repairs before his ten-year guarantee expires. A view of this pavement is given, which we think fairly represents its average condition. There is so much of accumulated filth on this street that, while we have visited it on three occasions, each some days apart, in order to secure such illustrations as we desired, we are unable to furnish all we sought.

There is one other piece of pavement which, while it extends but two blocks, is worth the notice of those interested in brick pavements who may visit the city. As it is in the heart of the city, it will be likely to come under the eye of visitors, and for such our brief statement concerning it is mainly made. It was evidently laid as an experiment, as it involved what may be called a very severe test of the capacity of brick to meet conditions which it is generally supposed only granite blocks are adequate for. This may be found on La Salle street, running from Randolph to Madison, bounding the City Hall and the Chamber of Commerce building on the west. No other pavements save those of granite are to be seen in this region. The bricks used are Galesburg repressed. A portion of this pavement was laid in 1893. For that on the east side of the street, between Washington and Madison, broken stone only was used for a foundation, as the time granted for laying (six days) was insufficient for concrete work. The balance of this stretch was laid in 1894 on a six-inch concrete foundation, and a tar filler was employed. The traffic is very heavy at this point, and a double line of car tracks, paved between with granite, adds to the stress of the traffic, from the tendency of heavily loaded trucks to run with one wheel in the grooved rail, so that a definite line of heavy service is thrown upon the brick. There is some indication that along this line some repairs may need to be made before the five-year guarantee shall have expired, but the sponsors of this bit of experimentation have nothing to apologize for in our judgment.

E. G. DURANT.

MIDSUMMER IN MAINE MUD YARDS.

FOURTH OF JULY marks the half-way journey of the brickmaking season in the State of Maine, and from Kittens on the south to Fort Kent on the Canadian border line the brickyards and brickmakers are humping themselves like all possessed. Never before in the long history of brickmaking in eastern Maine was such a profitable half season known. In 1893, after Boston had been laid in ashes, there was a month or two of profit and promise like this, but it never equaled it in profit, and in promise it proved a fraud. But this season builds a success upon a firm foundation, not one erected upon the fitful excitement of conflagration times, but upon the solid bed rock of a booming prosperity that cannot be retarded or discouraged.

Already the yards of Maine have turned out and burned more brick by a few million than all last season's output amounted to and the latter half of the season will (weather permitting) exceed the first half season's output by a great deal. And, speaking about the weather, it seems that all the fates combined and conspired to make the Maine brickmaker spend a joyous Fourth of July this year, for the like of such brickmaking weather has not been recorded in the ever-ready memory of "ye oldest inhabitant." To the weather is largely due the fact that in one-half season the output of brick in this section has exceeded the full season's output in other years, although, of course, the incentive of advance contracts has set more men at work in the yards than formerly.

The International Paper Company's big enterprises in pulp and paper mills at Millinoket, north of Bangor, in the east, and at Madison, north of Augusta, in the west of Maine, has had much to do with encouraging the brickmaking industry. Indeed, it seemed until within a few days as if Maine would be unable to supply herself with brick, but present indications are that the supply will barely equal the demand, leaving no brick to carry over. Had it not been exceptionally favorable weather season Maine must surely have been compelled to import brick, which would have looked even more strange to us than the carrying of coals to New Castle. But, though we have not been obliged to import, many particular changes have been wrought by the boom. For instance, Boston, having her small Maine supply completely shut off, turns to the opposite point of the compass and imports brick from Haverstraw, N. Y., and Hackensack, N. J. Bangor, the mother of eastern Maine brick shipping ports, has taken all the brick offered for sale along the Penobscot river for forty miles, and the strange sight is seen daily of schooners, brick laden, being towed into Bangor wharves to unload where, ever before, the brick cargoes went in the opposite directon.

I mentioned before that Bangor is erecting four or five great office buildings, and these, with the pulp mills, have heightened the demand. Brick are sellling readily at $6.50 to $7 per thousand up and down lots at the kiln, and every man in the business in this section is bound to lay up for a rainy day, or a dry one, a handsome sum of profits this fall, and this is not a pipe dream.

The mud yards used to raise a wild whoop of joy years ago when they got a twelve-arch kiln burned before the Fourth of July, and when it happened the crews were generally given a day off. This year every mud yard nearly has burned two twelve-arch kilns, and to-day every yard is fully manned and pounding out the brick to jig time. The sand-machine yards at Brewer and Bangor have done better. Hugh O'Brien's yard at Brewer has turned out 1,400,000 brick so far this season, and will turn out more than 1,600,000 more before closing. All of them are spoken for at a handsome price.

It was the alacrity with which Hugh O'Brien and Sam Holyoke grabbed the hint given in a former Clay-Worker in regard to Millinoket and the present boom that discouraged a movement to make brick near the site of the big pulp plant. The promoter of that enterprise having enlisted the services of the editor of The Clay-Worker to help him get machinery on the quiet, found, after he had looked the ground over and read the heaps of handsome catalogues and the stacks of friendly letters from brick machine men, that he had waked himself up about one month too late to go on with the enterprise, for even as he pondered the smoke was flying from O'Brien's first kiln, and on his return from Millinoket Holyoke was shipping brick red hot from the first kiln.

These and other circumstances made the erstwhile ambitious promotor stop and think, and, as he who hesitates is lost, so in hesitating Millinoket lost her brick plant and some enterprising machinery firm failed to get a fat order for machinery. But there is another day if we are only awake in time.

The entire output of the Penobscot Bay yards will be shipped to Bangor and transferred to B. & O. cars for Millinoket. Brick laying on the mill building will begin in October. Though prices range high in Bangor and Augusta, in the coast and bay yards prices are low, though all running to their fullest capacity. Brick are being purchased by the kiln, lots in Penobscot and Orland for $5 per thousand, and they make good brick there, too. One hundred new large dwelling houses are to be built immediately at Millinoket. The stumps are still standing upon the home sites. An immense saw mill is being built nearby the pulp mill site. Ten miles beyond, or eighty miles north of Bangor, another big pulp and paper mill (brick) is to be erected early next spring.

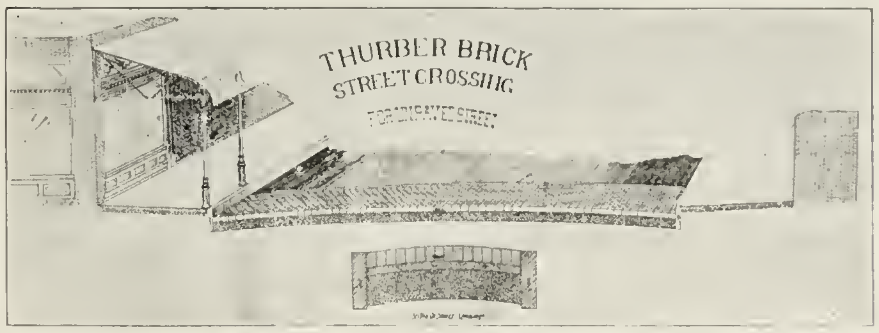
Talk about piping times. Its an exceedingly hot and oppressive Fourth of July, but the Maine brickmakers are feeling quite well I thank you. Let her boom right along.

BRIAN J. DUNN.

BRICK CROSSINGS—HOW THEY ARE MADE.

By A. O. Jones.

A vitrified brick street crossing three feet wide can be put down cheaper than a wooden crossing, when the question of 10 or 15 years' use without repairs is taken into consideration. What is known as the crown crossing is put in this way: We begin by excavating to a depth of about fourteen inches below where the crown of the cross walk will be needed. Then make an excavation dip from center of street both ways, so that should moisture in a wet season get to the foundation it will drain out into the gutter at both ends. Thus the foundation is always dry and consequently firm. When the trench is properly leveled we place eight inches of broken stone, brickbats or gravel and ram or roll until quite solid, then spread two inches of sand on top and level correctly and it is ready for the brick. Before the lower foundation is laid a curb of stone or a row of brick laid on end is placed in position to act as curb on both sides, a little below street level, say one inch or more, so that when the wheel of a vehicle strikes the walk it will not strike the curb but the rounding rise of the arched brick crossing. After two inches of sand has been laid on the foundation it is rounded to about three inches of a crown and the brick laid lengthwise of the crosssing and at right angles with the street, close to the curbing. We afterwards cover with dry, clean, fine sand to a depth of an inch; brush or work into all joints, as this sand will form an impervious filling or cement against water and rain and keep the foundation perfectly dry.



Reports of fire departments show that 75 per cent. of all breaks and damages are caused by making runs and from abrupt crossings and unseen chuckholes in the roadways and streets.

Now, with the brick crossing you glide over like a boat over a wave. Furthermore, the present crossing causes a jolt to the wheels of a vehicle, and in muddy weather loosens the mud and it drops right on your crossings, which become nearly covered with deep mud. With brick crossings it is different. The wheels of a wagon glide over the arched crossings easily, and carry the mud further on. Every shower washes it clean and every gust of wind blows it dustless. It is always in order, and, when you have your whole street paved with brick, the brick in these crossings can be taken up and used over and over again for an indefinite time.

Written for the CLAY-WORKER.

THE NEW YORK BRICK MARKET.

THE BEST OF WEATHER, active demand and good prices for stock up to July 1 has caused the brickmaker to be contented with his returns for labor and money invested for the first half of the season of 1899. If this season had as frequent rains and showers as 1898, resulting in curtailment of production, the market would have been short of stock to an extent that would have retarded building. The condition of the weather is directly opposite of a year ago—then no molding, and the men growling because they could not make full time. This season there has been less than a week of lost time since they began molding.

—The Outlook—

Is certainly bright for a very successful year of brickmaking, and prices should not fall below the six-dollar mark, if any judgment is used in shipments. When seventy or more barges of brick are taken off the market every week, keeping it practically clear of stock, why should it fall in price? The price has fluctuated, and certainly no one is to blame except the shipper who allows his brick to be sold off in the face of a demand, present and prospective, which has not existed for years. It certainly goes to show that it is time that there was a change of management; that men should take hold of the helm who know a good thing when they see it.

—The New Organization,—

Which reports tell us has assumed definite form, will, no doubt, reform the trade so far as the selling of the stock is concerned. The past month I mentioned that, if formed, there was one whom I thought would have a prominent position. About the time the matter was written it seemed that the officers and directors of the company were named, and the gentleman of whom I referred was chosen vice president of the American Brick Company. The choice of Robert Main for that position was no mistake, as he will bring knowledge of the abuses, if they can be called such, which are now allowed to govern the selling of brick, as "Bob" is on, and has been on the inside of all movements of the market. Among the other appointments the men who are directly connected with the manufacture of brick are conservative men, and one would say that nothing but good, sound business principles will rule. No drastic measures will prevail, thereby causing capital and labor to conflict.

—New Ideas—

May be brought forth by this concentration in few hands which will be to the benefit of all those who labor on the yards, as well as those who invest their money in the enterprises. Some say that they do not see how there can be any further reduction in the number of men employed, or, in fact, any way in which the cost of production can be reduced. Five years hence the bosses of to-day may be heard to say, "I did not think it possible." Nothing is impossible, so it is said in the matter of reducing the cost of making the Yankee is without a peer.

—Waste.—

Can it be that such exists around the brickyards of to-day? There is a scrap pile around all factories, and no doubt many of your readers have visited other yards and seen evidence of such around his neighbor's yard and congratulated himself that no such was found on his, when the same state of discarded stuff was lying around, possibly not of the same kind of material, but waste. How produced—by accident? No. By foolish investment? Yes. It is a broad assertion to make, and requires some explanation. Is it not a foolish and wasteful investment to buy some piece of machinery without giving due thought as to whether it will serve its purpose? It is done every day. Walk around a yard and you will see a sight, "Not in use." For instance, take the patent sander. (I am not against its use.) The boss may make brick in a section where the sander gets drunk, and very often a pit is lost because he is in no condition to sand. The boss is heard to say, "If I live till next year there will be no cause to lay still." The next spring sanders are put in, and he is a happy man. It is not many days before he is a most unhappy man, for the belt or chain which runs it breaks or slips, or the many erratic things which happen from nonattention from those who should attend to that part of the plant, and the machines are an hour behind other yards getting out. Instead of improving, things get worse, and truckers leave as the result of the machine getting out so late. It is of no use to-day to try and keep a gang of truckers if the machines are not out as soon or earlier than the next yard. He manages to get through the season. The next season any one who visits the yard will see sitting out in the weather one or more sanders, without any protection from the rain, and that is not beneficial to iron. If that is not waste, what do you call it? It was a case of anger in the first place, and, if he had taken time to think the matter over, carefully considering the condition attached to the output, he would have saved the cost of the sander, which would have been quite a sum. In the spring of 1898 one of the yards here put in sanders. The spring of 1899 sees them replaced with the man behind the box. A short time ago I was on two yards. One of them has twelve sanders rusting down, the other six—a nice sum of money wasted for want of proper forethought.

—Progressive,—

In his own estimation, is the majority of bosses, and he will not stop to consider, if he makes up his mind that he will do better work if he makes his molds a trifle larger or smaller, as the whim strikes him, and he does so. Result, his brick do not burn right, and his kiln shows a larger per cent. of light brick. He tries the second kiln with like results. He then sends a hurry order to the mold maker for an outfit of molds of the same size as former years. By the time these molds come in, the pale brick cut off some of his returns. That is a sort of progressive waste. Represented in one way by, say two sets of molds used a month or two, but now piled away in the engine house, of no use to him or any one else, except he takes them home and makes walks around his house. Many molds but little used have I seen put to that use.

Another wasteful measure, one practiced to an extreme, which would seem to court loss, is experimenting with coal, and then they say they cannot see how it is that they make nothing. It certainly is a sheer waste to put up temporary kilns for the use of coal. If determined to burn with coal, put up a coal kiln of some well-known make; then engage some one who has burned with coal and given satisfaction. Many a dollar that was needed in the business has been wasted in the endeavor to burn with coal, as they thought it could be done with less cost per M, or, in other words, be the first in their locality to use coal. Is it not a waste of money to buy coal dust that should be screened before putting it in brick, as it was so coarse that many of the brick burst in burning, causing swelled brick and loss? If screened, there is the cost of the man employed at that job.

—The Best of Everything Used in the Manufacture of Brick Is None too Good—

Should be pasted in the hat of every brickmaker. This is one other source of waste, and a costly one it is—the buying of wood which is not fit to use; first, green wood; second, too old, and, third, too heavy. How a boss expects good work when the wood he buys is round, heavy and in many cases not seasoned is a mystery. "Oh, it is good, strong wood," he tells the foreman. Yes, and, if properly split, would be good and strong, but the size causes the use of a dozen sticks where one properly split would answer the purpose better. Not many miles from here there was a lesson taught the boss that would be satisfactory. When the time came to heat up, the wood pile had been overhauled to get the small wood till there was none on hand, and all that could be done was to make some, and the boss with five others had to split up the heavy logs. Where was the saving? Was it not a waste of money, all that extra work? Brickmaking will not allow any experimenting Close attention to details is required.

—The Market—

Is all right, so far as absorbing brick goes, not so the price. A good, active demand should hold up the rate. Not so at present. It has fallen off at least a dollar in the past month. You pay your money and take your choice. Between $5 and $6 may cover the rate. The future may not show up as well, as there seems to be "something" that can push things down on a market that is bought up close each day. What is it? Why is it? A. N. OLDTIMER.

Written for The Clay-Worker.

MAKING AND USING BRICK.

How the Art is Taught Colored Pupils at the St. Augustine's Industrial School, Raleigh, N. C.

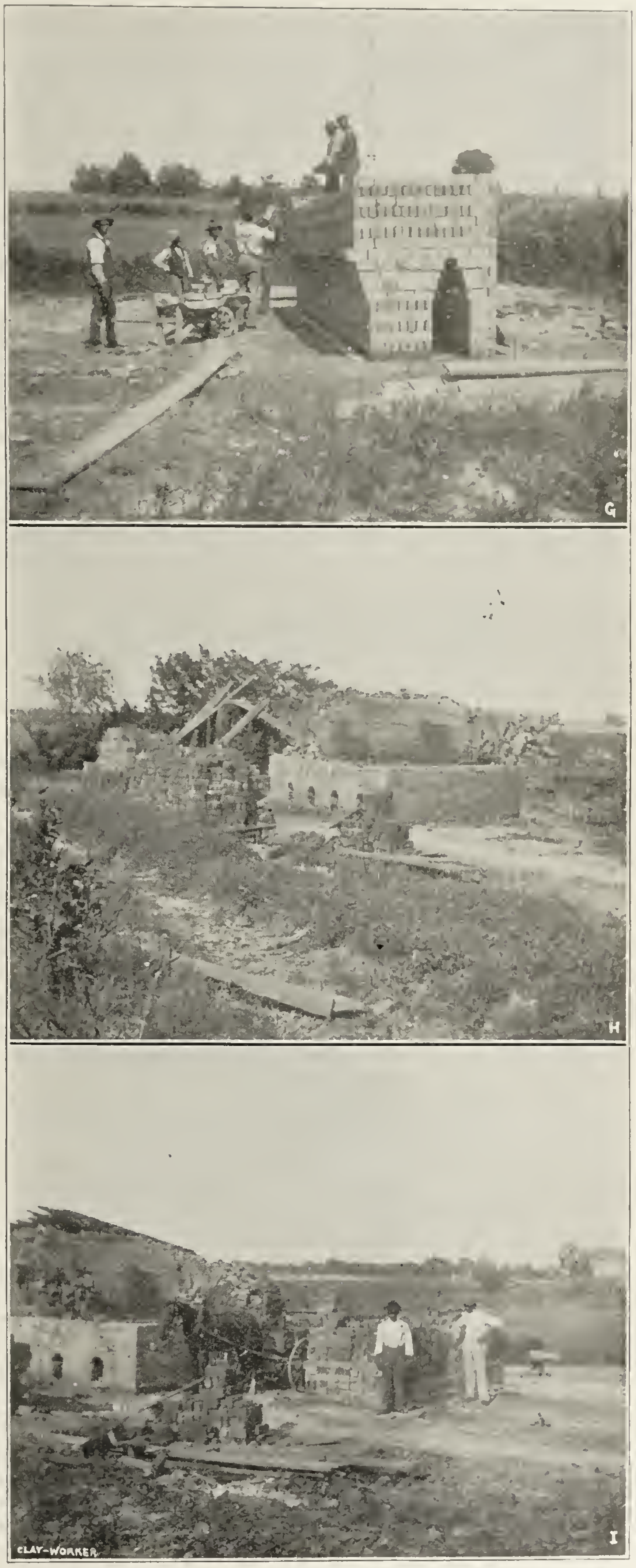
INDUSTRIAL EDUCATION is a growing fad, therefore the subject is of general interest. At St. Augustine's School, while it is primarily a a normal and collegiate institute, the industrial training has a large place in the development of the students. We should say rather that there is great care taken with the trades education, for here the instruction is in various trades in which the boys are taught to be mechanics. The trades department comprises classes in bricklaying, carpentry and printing, but since the readers of The Clay-Worker are most interested in brick and brickmaking I will confine myself to this branch of our work. There is upon the school grounds an excellent clay bed, strata of which excel any other clay in the vicinity, so that we are able to turn out besides the ordinary colors and qualities a white and terra cotta brick of peculiar hardness.

The brickyard is admirably situated. The machine is on a rise of ground, with the yard for drying below it, and the kilns below this, so that the brick are taken down hill, requiring less labor and facilitating the work greatly. The clay is drawn from the pit on cars by steam power and dumped on a platform above the machine. The arrangement of the whole yard is a credit to the Rev. Mr. Delany, a negro priest, who superintended its construction, and who has charge of this work, in addition to his duties as vice principal and teacher in the school.

The boys of the bricklaying class spend the first year of their apprenticeship on the brickyard learning to make brick, and also learning values of the different kinds of clay, so that they may the better understand how to lay the brick. The output of the yard is about 10,000 per day; one kiln of 200,000 has been burned, and a second is being filled.

The brick are used largely in the improvement of the school. The bricklaying class has built a four-story addition to the boys' dormitory and a stone library building. They are now building a brick laundry and a clergy house, the basement of which is of brick. The specimens of work done by the boys at this school would convince the most skeptical that it is not a waste of time and money to teach the negro a trade, and we believe that the increase of tradesmen among them means their ultimate elevation and independence, and this is the only way to save them from pauperdom and criminality.

H. L. M.



Making and Using Brick—Starting a New Kiln. An Old Kiln. Sorting Brick from Old Kiln.

For bargains in machinery, experienced workmen, desirable situations, etc., look through the "Wanted, For Sale," etc., columns of this issue.

Written for the CLAY-WORKER.

THE AMERICAN POTTER.

The Slow Progress Compared with the Iron and Steel Industries.

A VERY PLEASING and interesting article is going the rounds telling of the favorable impression the United States is making on the European nations by the rapid progress in iron and steel in the way of quality and cheapness. Now, why should this be so? Europe is a much older country than the United States, and has been in the iron and steel business much longer. For years and years iron and steel was one of our heaviest imports, but to-day we are exporting it in large quantities to Europe. The secret of this phase of the iron and steel industry is just this:

The American manufacturer has accepted the difficult problems which the chemist has worked out for him to prevent him from stumbling over the same old block from time to time by not knowing of what his raw material consisted, for, as he shoveled so many pounds of each of the ingredients to make up his charge, little did he know what the result would be until it was drawn, and at this point his loss would be very heavy. To-day, however, one can hardly find an iron or steel plant of any note but that it is run under the supervision of a chemist, and not a charge is put into the mill without the expected result, and there are a vast variety of industries which have been very much improved by the application of the science of chemistry.

But there is still one industry in this country which I would like to draw your attention to, and that is the clay and pottery industry. It is the oldest and most important of all industries in the benefits which it has conferred on civilzed man. Still it is to-day one of the tardiest to accept the aid or rather yield to the control of chemical technology. Have you ever stopped to think of the real value of clay—think of something which can be made in which clay does not play a part, direct or indirect? Yet how quick will a manufacturer condemn certain clays which do not yield good results to his application, without any knowledge of its chemical, physical or pyrometric properties! Why should the clay manufacturer expect to handle the clay industry without any heavy loss, any more so than the iron and steel manufacturers? You have noticed with pleasing results the position the United States has been placed in its iron and steel industries by other nations by yielding to the control of chemical technology. But, in looking at our pottery industry, one would judge, if not closely connected with the business, that it is almost perfect in its mechanism and quality through its long years of experience, but I am sorry to say that the pottery industry is still in the field of speculation; but the writer can see no reason why we should not make as good ware in this country as they do abroad. But there is little hope for the present manufacturer to make a better class of ware so long as he continues by his present rule of thumb system. It is a shame to have the foreign manufacturer bring his goods so far and reap the profit of our own market, when we have every means for making as good ware in this country as they have abroad. Here are a few figures showing the value of the crockery imports from 1890 to 1898:

1890, $5,967,626; 1891, $7,525,390; 1892, $8,293,769; 1893, $8,931,949; 1894, $6,351,633; 1895, $9,646,283; 1896, $10,109,641; 1897, $8,479,302.

Such startling figures as these ought to put the potter to thinking, and try some other means of making than the present, and not continue turning ware upon the market of inferior quality.

Let us stop for a moment and notice what the potter is doing. Then we may be better able to tell why he does not improve upon his ware. The writer has seen a great many cases of this sort where the potter has bought a receipt for the composition of his ware, and also the glaze, and began the manufacture of ware. Now, what does this receipt mean to him? It means this, that, if nature had formed all the clays alike, regardless of the condition in which we find them, and the receipt was a good one, and he understood the mechanical manipulation of it, he would likely make a good piece of ware, but here is where he experiences a serious difficulty. While the potter's recipe calls for so many pounds of spar and so many pounds of clay and so many of flint, he doesn't always get the same results; but little can he tell until the damage is done, for, while he takes for granted that clay is clay, spar is spar and flint is flint the world over, there is a vast difference in its chemical, physical and pyrometric effect. While a pure clay is practically made up of silica, 46.47 per cent.; aluminum, 38.82 per cent.; ferric oxide, 0.89 per cent.; lime, 0.2 per cent.; magnesia, 0.25 per cent.; potash, 0.63 per cent.; soda, 0.12 per cent.; combined water, 13 per cent., and pure spar is practically made of silica, 64.32 per cent.; aluminum, 19.41 per cent.; ferric oxide, 0.14 per cent.; lime, traces; magnesia, 0.35 per cent.; potash, 12.90 per cent.; soda, 2.10 per cent., and flint is practically made up of silica, 98.52 per cent.; aluminum, 1.04 per cent.; ferric oxide, 0.04 per cent.; potash, 0.40 per cent., it is very seldom that we find two shipments alike.

They differ very widely in their composition, physical structure and pyrometric effect, and, while each one of the above ingredients plays a very important part under the action of heat, but once assured of our facts we may be certain that they are immutable in the made-up composition of our ware. So it is very important that the potter should know of what his raw material is composed, for, while he shovels so many pounds of clay, spar and flint to fill his receipt to make his ware from time to time, he has no assurance that he is getting the same results, for he keeps his mechanical manipulation as near the same as he can. It is astonishing to see the heavy loss the potter experiences in the first burning by this rule of thumb system. Could the chemist at this point cut the loss down but three-fourths he would be saving the manufacturer, after deducting the expense of having a chemist, over $10,000, not considering the improvement in the quality of his ware. These figures may seem large, but, nevertheless, they are true, if applied to the greater part of the manufacturers of to-day. It is just as important for the potter to know the composition of his raw material as it is for the iron or steel manufacturer, and we are aware of the advantage to the iron and steel industry of the application of chemical technology.

We find that the German and French potters are much farther advanced in their line of work than the American potter, due partly to the long experience, but mostly to his willingness to accept any new problems which the chemist has worked out that may be helpful to him in making better ware and also in bringing his work more to a system. Now, the evidence of the better ware can be noticed every day. Walk into almost any crockery store in your city and ask to be shown a good piece of ware, and almost invariably they will show you an imported piece of ware. Why should this be the case? Not because we haven't the raw material in this country, for it has been proven without a doubt that we have as fine clay as in foreign countries. It is the unwillingness of the present manufacturer to yield to any other system than the rule of thumb system which he now has. The American potter pays a great deal of attention to the different styles in shape and decorations, but little or no change does he make in the quality of his ware, and for that reason has the same old defects.

The American potter puts me in mind of a lady I once knew, who spent a great deal of her time trying to keep up with the styles. She paid the highest prices to have her dresses made, got the best of trimmings, and her dresses looked very nice at first, but her dresses did not look nice very long, and she wondered why it was. Some one asked her once what kind of material she used, and it developed that it was cheap goods. Thus the problem was solved. The American ware looks very nice, when it first leaves the factory, to any one who is not thoroughly acquainted with it, but, hold a piece of it between you and the light, and you will readily see that it is opaque. It doesn't have that translucency which a fine piece of porcelain has. Take a piece and chip the edge a bit, and apply black ink and try to wash it off.

Ware, through domestic use, gets chipped more or less, and, when it is put into dirty, greasy water, it absorbs it and leaves a black mark which is not very pleasant. The last, but not least, of the defects is the crazing. How embarrassing it is for a traveling salesman to sell a bill of goods to a customer and when he goes to call on him the next time finds that his first bill is on the shelf, all crazed! The song they all sing you is, "Oh, our ware doesn't craze any more; that was a bad batch of clay we just got in and didn't know it," but they have no assurance by the present system of making that their goods will not craze.

I was at East Liverpool, O., not long ago, when a person told me that one of the oldest established firms there had shut down a certain part of their works to burn over the ware which had crazed on their hands.

What does this burning the ware over again mean? Why, this: They heat the glaze to a fluid condition to cover up the cracks, which are due to crazing, but it doesn't prevent it from crazing again sooner or later. What is the cause of crazing? may be asked.

—What Causes Crazing?—

To answer this question in full would make this paper rather lengthy, but I will answer it in brief, so the reader may have a conception of what causes crazing. It is a known fact that gases, liquids and solids expand upon heating and contract again when cooling, so, for each degree of temperature you raise the gases, liquids and solids, they expand differently, gases the most, liquids next and solids last, so the amount for each degree they expand is called co-efficient of expansion; so while the composition of the ware in all stages of the process of manufacture is called a solid, and the glaze while forming itself on this solid is in a liquid condition, if the contraction of the glaze is not in harmony with the composition of the ware it will cause a tension between the body and glaze, and sometimes the tension is so strong that the ware crazes before it leaves the factory, but the smaller the tension between the body and glaze the longer the ware will stand without crazing. So you can see why a piece of ware will craze if only kept in the warehouse of a factory. You can judge for yourselves the good it is to burn a piece of ware over which has once been crazed. While the body of a piece of ware is practically made up of clay substance, feldspar and flint, and the glaze is made up of oxide of lead, oxide of zinc, carbonate of lime, clay substance, feldspar and boracic acid, the potter shovels so many pounds of each of the above ingredients, regardless of the purity of any, knowing little of the result until it comes out of the kiln.

It is feasible to make a body and glaze which will work in harmony with our American material, if we go at it in a more systematic way than the present rule of thumb system. But talk to the potter of the ceramic science, he will only laugh at you and refer you to so many chemists who have made little or no progress in the pottery industry through the chemical process. Why did they not progress by the chemical application? The reasons which have united to produce, or rather retard, their progress are possibly many. First, he might rely too much on the chemical analysis and not enough on the physical and pyrometric data of the clay; and, besides, the chemist has not always been able to see the connection between the results of his analysis and the practical facts they are supposed to explain. But could the chemist take off his apron and fill the different positions, from the mixing of the body and glaze to the burning of it in the kilns, I think he would make a much better progress. Because some have made little or no advancement by the application of chemistry is no reason why the potter should condemn the ceramic science. We should condemn the chemist for not knowing more about the science.

The reader may think the writer very much of a critic on the pottery industry of this country. I think I have very good reason to be, and if you understood the position of the writer you would not censure him for it. The writer spent four years of his time at the Ohio State University, at Columbus, getting the chemical and theoretical part of clays, completing the course in 1896. He then entered the pottery field in a practical way, for he had realized the value of the practical knowledge in connection with the chemical. While he filled the different positions, from the mixing of the body and glaze to the firing of the kiln, he finds it a very up-hill business, with all that, to make a livelihood, due to the jealous disposition of the foreman with whom he comes in contact, who holds him out at arm's length, as though he were some desperate character.

A CERAMIC CHEMIST.

NOTES FROM TIDE WATER, VA.

On June 10 lightning struck the engine house of the Nansemond River Brick and Tile Company's plant and set fire to it. It happened at 10:30 at night, and by the time it was discovered the entire engine house and machinery room wos on fire, and was entirely destroyed, with all tools, etc. The loss is estimated at about $2,500 with no insurance. They will rebuild as soon as possible.

Brick are now $8 per thousand in Norfolk, an advance of $1.50 per thousand over last year's prices, even at present prices the supply is short and there are a number of jobs delayed in Norfolk on account of the short supply. Terra cotta and cut stone have both advanced.

Mr. John A. Pilcher, of Philadelphia, Pa., will start the brick plant at Broadway on the Appomattox river to running soon. This plant has been shut down for some time.

Mr. Geo. Stayer has leased the Oldfield yard at Oldfield, Va., on the James river, and expects to start up as soon as the yard can be put in shape.

All the yards in this section are very busy trying to keep up with their orders, and from all appearances the summer yards will shut down this fall with very little stock for the winter and early spring trade.

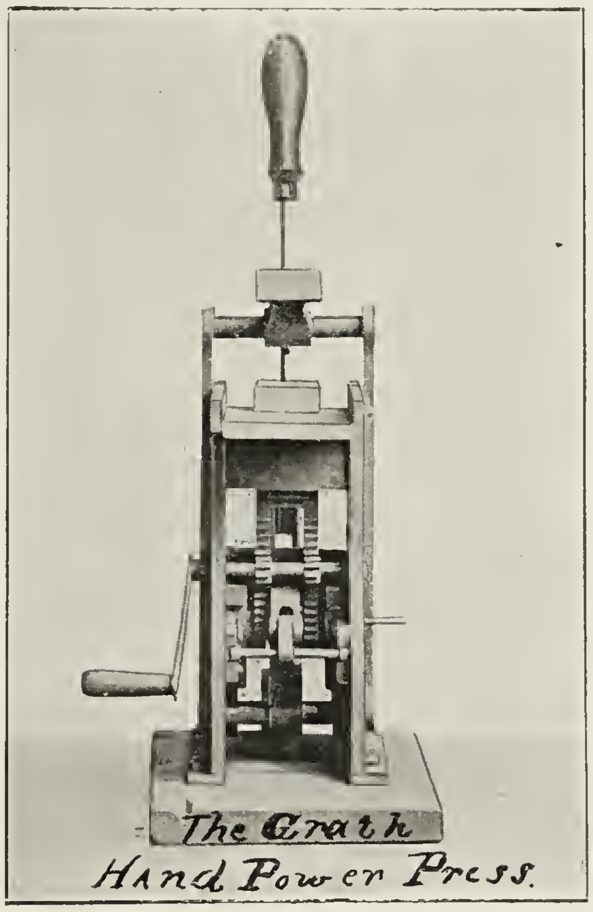
Dr. G. B. Wood, of Belfield, Va., is putting in new and larger machinery in his yard at that place and expects to double his present capacity.

H. L. JACOBS.

Suffolk, Va.

A NEW HAND-POWER BRICK PRESS.

We are pleased to present a cut of the Grath dry clay hand-power press on page 74 of this issue. This press is simple, durable and very powerful in construction. By the combined lever and double toggle movement great pressing power is obtained. The inventor claims that as much power can be applied to the brick as can be obtained from any steam-power press. This press is for both plain and ornamental brick. Either dry clay or semi-dry clay can be used. No brickyard is complete without the use of the hand-power press, as orders for small amounts of special ornamental brick or ornamental brick which are not in stock are constantly received. By having a press of this sort a stock of ornamental brick can always be kept full and special shapes can be turned out with very little expense. For small yards making nothing but common brick this machine is a bonanza, as two men can turn out from 1,000 to 1,200 first quality press brick every day, or from 600 to 800 first quality ornamental brick. Further information can be obtained by addressing the Illinois Supply and Construction Company, St. Louis, Mo.



ADVICE FROM "BUSINESS."

If in this world you wish to win
And rise above the common chump,
Take off your coat and pitch right in;
Don't wait—lay hold, hang on and hump.

Don't wait until the iron's hot,
But make it hot by muscle.
Don't wait for wealth your father's got—
Take off your coat and hustle.

BY THE LIGHT OF THE KILN FIRE

OLD-TIME BRICKYARD CONTESTS.

THE LIGHTS AND SHADES of human character are shown in the brickyards as in other places of which more is written. I'm thinking now of some of the episodes of a past generation and of the many strong proofs of the common brotherhood of man that have had their origin in the mud and about the kiln. We all know that forty or fifty years ago the brickyards of New England were manned by natives almost exclusively. They were a hardy set, and as strong in character as they were physically. Descendants of Puritan ancestors, though poor their vocation, they inherited the Puritan dislike for foreigners, particularly the Irish foreigner, who came among them. In manly fashion, too, be it said, by sheer force of muscle and sinew, they kept the brickyards free for years from the foreign element that essayed to enter there.

But now and then a foreigner was found who stood the test, and, despite the "running," as it was called, managed to hold his own and his job. It might take three weeks or three months to satisfy the crew that he was fit to remain among them, but, when it did come, there was seldom a radical distinction made by the men thereafter.

When Pat Murphy landed from his Irish home, some fifty-odd years ago, he followed the railroad then building north from Boston, and in course of time found himself near a brickyard in a certain Maine town. He was a magnificent type of manhood, and had turned his hands to every form of manual labor but brickmaking. He was young, too, and filled with the courage of hope that comes to every immigrant on his arrival in the land of the free from a land of poverty and persecution. So Pat Murphy hired to work in the brickyard. He was not the first foreigner to come among the Yankee crew, for many Irishmen had tried before him, only to be run out in a day or two, and so, when Murphy showed up in working togs, and asked, in mellow Irish brogue, "phware" they were going to put him "fusht," the crew made no attempt to disguise their purpose to run him out. There was no mean advantage taken, however. I seldom saw a mean advantage taken of an opponent in one of the old-time brickmaking contests. The "greenhorn" was taught to "strike" and "carry off" to hake and fill tread with impartial interest, but in the work of it he was put to the utmost limit of endurance.

I have heard it said how one Howard, a famous brickyard bully, once dumped his mold of brick upon the back of a slow greenhorn who learned too slowly to turn molds, and many similar things were credited to Howard, who was looked upon as the champion brickmaker and terror to greenhorns and foreigners among a score of brickyards. It was against this Howard that, at the end of three weeks, greenhorn Murphy was put striking. Howard was far from being bad-hearted, but he was to worry and drive out the foreigners from principle. "Now, Irish," he said, as they were dressing for the mud, "when you can't hold out any longer, just tip your mold wrong side up and quit, and don't ever come back to try the brickyard in these parts, and you'll be all right. But if you 'aint got sense enough to know when you have enough I'll be the death of you." Murphy allowed that when he had enough that Howard would be far from as fresh as he then was, and then began one of those fierce contests that only a brickmaker who has been there can understand.

The forenoon striking passed like an exciting show. Every man in the crew, no matter where employed, was watching hour by hour for the Irishman to throw down his mold, which was equivalent to throwing up the sponge. As the forenoon shortened, and Murphy still kept pace with his opponent, the excitement grew, and, when noon came and found him keeping even pace with the terror, the admiration of the men was boundless. The contest lasted during the afternoon at wheeling and tossing, at haking, and again in the evening after supper there was more wheeling and tossing, till darkness fell upon all and stopped the contest. For two hours after the regular day was done the crew drew around and watched this battle of the champions—the Yankee against the foreigner—and not a hair's breadth of advantage could one show over the other. There was no sympathy for Murphy in the morning, and there were no words of admiration in the evening, but every man there could take the Irishman's hand and tell him that he was a trump. But they didn't.

That night Howard passed much of the night drinking with the boys, and expressed unbounded admiration for the plucky Mick. Next morning he complained of feeling ill from the effects of drinking, and staid in bed. No one thought seriously of it. Next day, however, Howard was dead—from what cause no one knew. He had been a generous-hearted, convivial spirit, and his money had gone as freely as the wind. There was not a cent to give him burial. Pat Murphy said nothing, but from his greenhorn's wages of $16 a month passed $5 to the boss to help "give a dasent man a dasent burial." At first this act of generosity paralyzed the crew, and then they cheered Murphy and followed his example. Howard was given a rousing brickyard funeral, and Murphy for forty years afterward was a brickyard foreman and burner, respected and loved by those who knew him. No green hand was ever too severely pushed where Pat Murphy bossed, and, in fact, since his advent, racial prejudice dwindled from many causes of which his manly action was no insignificant one.

A YANKEE MICK.

There was an Irish crew a few years ago in a neighboring brickyard. The Irish had begun to come in flocks then, and they flocked together. They hung out no warning signs, but, if one understood the native tongue of Galway and Cork, he could plainly understand that "no Yankees or Frenchmen were wanted" in that yard. One day a pleasant-faced young fellow came to the yard, and, in the most perfect English, applied to the proprietor for work. The proprietor liked his looks and hired him. It is needless to say that the "Yankee greenhorn" caught fits from his Irish fellow workers each day, but every night he was cheered and encouraged and advised by the members of the Yankee crews near by.

At the end of a few weeks he occupied the most prominent position in the thoughts of the brickmakers of the town. As a champion of Yankeeism his little velvet cap was leading the Irish competitors to a faster and faster contest, and at length Yankee pride could do no more than suggest a regular out-and-out brickyard duel between Pete the Yankee and Pat the Mick. Pat was known as one of the best strikers in that section, and the contest was easily brought about. There was lots of fun in arranging the preliminaries, and Yankees and Irish dropped over occasionally to see how things were getting along. Along about 10 o'clock a wild Yankee cheer told that Pete had begun to gain on his opponent. In a short time the faintest doubt was dispelled. Pat was vanquished. Pete stood victor triumphant.

Yankees were glowing with satisfaction. Irish were looking black and disappointed, while poor Pat slowly dragged himself in front of the machine. Pete gave him one final taunt. "Hurry up, Mick," he said, and then, to the astonishment of all, he added, in the most mellifluous Gaelic that ever passed a Connaught man's throat, "Arra Faugh a ballagh go Magh as Shoidh. Punkawn magh as Gallcava Misha." Get out of my way, man; get out of here. I'm a Yankee for you out of Galway, Ireland." The Irish were astonished, the Yankees were astounded, but it was too good a joke to leave the faintest sting, and between the Irish and the Yankees in the various yards there was a better feeling thereafter. Pete afterwards distinguished himself for bravery under fire in several battles dring the civil war with the famous Second Maine Regiment. His name was Peter Welch.

FROM THE BRICKYARD TO THE BATTLE FIELD.

When Frank Hurd and Peter Haggerty met about the brickyard there was always trouble. Frank was a Yankee from Yankeedom. Peter Haggerty was Irish from Ireland. Frank became a mason, and sometimes Pete was sent to tend mason, and found that mason to be Frank Hurd. Then there was noise and sound of international strife, while fellow workmen listened and laughed. The war came on, and the Yankees were driven back at Manassass. In the rush and roar and disorder of retreat, Pete Haggerty, with a Union uniform on him, was sprinting as fast as a well-developed constitution would permit.

Lying in a hollow in the field, groaning, was a Yankee soldier. His eye caught a glimpse of the flying Irishman. "Pete Haggerty!" he called; "for God's sake, Pete, come and lug me out of this. I will be trampled on and killed." Pete halted suddenly. "Is it yourself, Frank Hurd, and phwat the divil brought you into the army anyhow, you d—n fool?" "Oh, don't stop to talk, Pete, but lug me out of here quick," cried Frank. "Well, of all the fools I ever saw there is no fool like a fool of a Yankee," commented Pete, as he reached for his pipe and prepared to light it, adding, as he felt for a match, "Frank Hurd, with the sweetest wife and purtiest family, God bless them, and him out here to be shot. Phwat ails ye, Frank?" "Oh, Pete, can't you see my whole underpinning is shot away? For God's sake, man, don't delay, but carry me out of this." "Wait till I light me pipe," said Pete, and, having done so, he tenderly lifted Hurd, and, with smoke issuing from his mouth, he went like a steam engine with his burden across the fields, commenting on and condemning the Yankee "ijet" on his back at every step.

They passed a litter supported by four men, carrying a wounded officer. One of the bearers was wounded and weak from the loss of blood. "Put down that man and bear a hand here," commanded the officer of Haggerty. "Yes, put me down, Peter; don't disobey orders," said Hurd. "Put down nothing," yelled Pete, answering both. "Frank Hurd's life is jist as good to him as yours is to you. He's nothing but a big fool of a Yankee, but I'll be shot before I leave him." And Peter didn't leave him until he landed him in the hospital wagon. Peter Haggerty died last year, and Frank Hurd mourns him as for a brother. These little sketches, each born in the brickyard, each true as they are told, show that the brickyard has its uses as a leveler of social and sectional line fences.

A Hand Gang "Setting Out."

THE DREAMER.

Written for the CLAY-WORKER.

BALTIMORE BUILDERS AND BRICKMAKERS.

IN RESPONSE to an earnest invitation from the Baltimore Master Builders' Exchange, I found myself a participant at the yearly meeting, election of officers and the hearty spread which usually attends that annual event. As no other scribe was on hand, I felt that it was a delicate compliment to The Clay-Worker, and I tried my level best to show my appreciation of the compliment and the good things provided for the inner man. There's no use talking; you've got to be in Baltimore to eat and enjoy chicken a la Maryland.

But to the business of the occasion. The genial president, P. M. Womble, jr., and all the officers were unanimously reelected. This included brickmaker August Wehr as second vice, president and big-hearted Charles H. Classen as one of the directors. One thing I notice while at the Exchange, and that is something I haven't noticed elsewhere, and that was that the brick men were much in evidence. Usually, I think, the attendance is more confined to contractors, master plumbers, plasterers, roofers and steam-heating men. At noon sharp the men congregate, orders are cheerfully given and as cheerfully received, in the good, easy, fraternal way of "Say, Charlie, I wish you would send over 5,000 hard and 10,000 sand brick as early as you can." The architect drops in with an invitation for bids on a prospective job, and the entire crew are called on in the sum total of the specifications; all materialize and vanish to their respective quarters in less than sixty minutes. It's an hour well spent, men have rubbed shoulder to shoulder, and one hundred words spoken nicely and to the point beats a letter of five hundred words all to atoms.

—August Wehr's Trim Brick Plants—

Stand at the end of the line of East Monument Place, where, within the graphaphone distance, can be seen Klein & Bros. and the yard of Smith & Schwartz. Breaking through the fifty-three acres and up along the tempering pits, I came across W. F., the stalwart son of August Wehr, who extended the glad hand of welcome and showed me around. His pleasure was undoubtedly due to the pride he took in having everything in clean, ship-shape condition. Wherein he invests the interest of the master wtih the inherent pride of the master workman. He pointed out with great satisfaction the spotless condition of the 50-horse-power Atlas engine and the 60-horse-power boiler, which were shipped to them over eight years ago from Indianapolis, during which time it was worked in and out of season to their highest expectations. In the same yard stands one of the York Manufacturing Company's, of 35-horse-power, and a Deusmead & Son boiler, of 65-horse-power. These are used as alternates for the lower end of the yard, thus running the machine and the pits. The machine, a Martin, is an excellent one, and, when they want to, they can speed her to twenty molds a minute, although, as a general rule, they run from twelve to fourteen. Adjacent to the machine shed is the sand dryer, and extending right and left of this are the six seventy-five-foot tempering pits. Thus the entire line is in continuity, backed by the famous clay bank, already down to a depth of twenty-four feet, with little or no shale, but a good, tenacious clay. Running contrawise are the hacking and drying sheds, which run close up to the four ten-arch and one nine-arch up-draft kilns, centralizing by the office, and closed at the one end by the seventeen-stall stable, as clean almost as a Dutch kitchen, and at the opposite end by the fourteen to eighteen-hand gang.

Wehr's Good Clay Bank.

Here was a splendid bit of color combination. The colored gentleman and the marvelous carmine colors of the clay blocks set out on a bleached drying floor, top mounted with a bright blue sky, afforded a golden opportunity to the scheme of color photography, but that is not yet within our grasp. The Wehrs can keep from 150 to 180 men going, and turn out common, sand, press and repress brick to the tune of 15,000,000 to 17,000,000 every year. Father and son both shake with the right hand, and, possessing the senses of good workmanship, discipline and executive ability, rarely find themselves standing idle. Over on the smaller yard, which covers some seventeen acres, one meets with the same economic conditions. In this I came across two Martin machines and two sanders, no pugger and screens. Owing to the soft condition of the clay this is rendered impossible. One of the machines has been worked since 1892 without giving the Wehrs the slightest trouble, except it might be the breaking of a bolt—a mere bagatelle. Here they hack and dry, and, after drying put them into green stock sheds. The kilns are fed by two flues to each arch, in place of the one flue formerly used. This they deem a great improvement, and, in order to stand the test of the great heat and expansion from the enlarged fire room, they have taken the precaution to line the inside of each kiln with good fire brick—a little more expensive at the start, but giving better results. For over fifteen years here and eight years at Canton and Delair the Wehrs have been successful in brickmaking and better still in the selling. Baltimore can and will turn out this year 150,000,000 to 175,000,000. So, boys, all along the line, look out.

W. P. LOCKINGTON.

PACIFIC COAST NEWS.

NOTWITHSTANDING the fact that it is now midsummer, and that there is a notable falling off in nearly all lines of trade, the brick and pottery men seem to have about as many orders as they can fill. The pottery plants in particular are working to their full capacity. The complaint of low prices of brick is still heard, but there seems to be a tendency just now for prices to stiffen.

Articles of incorporation of the Independent Pottery Co. have been filed in San Francisco. The objects of the concern are to do a general pottery businesss, manufacturing and selling it, etc. Chas. A. Hug, F. S. Samuels and others are the incorporators. The concern is capitalized at $100,000.

The Steiger pottery at South San Francisco, Cal., is running full time and full handed, employing over 100 men.

A large shipment of brick, terra cotta and pipe was recently shipped from the pottery at Lincoln, Cal., to Honolulu, H. I.

The Haines brickyard at Haines, Alaska, is making brick at that place. This is the only brickyard in Alaska, and everything points to the success of the industry. The proprietors are arranging to put scows on the canal for the purpose of transporting the output to Juneau and Skagway, where they will be able to find a ready market for it at paying prices.

V. Holz & Son, at Grangeville, Idaho, are now making from 15,000 to 20,000 brick per day. Fifteen men are employed in the yard.

James J. Hanley has been appointed local agent at Navada City, Cal., for the well-known Sacramento, Cal., brick.

Articles of incorporation have been filed of the Southern California Marble and Tile Co., with the principal place of business at San Bernardino, Cal. The capital stock is $100,000. The incorporators are F. W. Armitage, H. O. Maynard, H. F. Bradburne and Henry Ingram, all of that city.

Neuhaus Bros., proprietors of the Neuhaus brick kiln, two miles from Baker City, Ore., have just finished burning about 200,000 brick of a superior quality. A new bank of clay has just been opened, which is even better than that now being used. There is an abundance of the clay, and, in addition to the ordinary brick, they are now making an ornamental brick which is very fine.

Claude Hancock has begun work on another brick kiln at Riverside, Cal.

John Kusler has started his brickyard at Oakesdale, Wash., employing a force of seven men. He will soon add six more.

As the harvesting season is now on in this State, several industries throughout the country are short of help. Holt & Gregg report that it is impossible to secure enough men in their brickyard at Anderson to run to its fullest capacity, although they pay good wages.

The next kiln of brick at the Curran & Lindgren yard at Bakersfield, Cal., will be burned with crude oil, as they are now figuring on putting in a plant with forty burners.

L. C. Hulse, of East Pine, will soon start a brickyard at Carson City, Nevada. His brother will also be associated with him in the business. Both are experienced in this line of work, and they will, no doubt, make a success of it. Mr. Hulse is a chimney builder, and will combine this work with the manufacture of brick. He already has a good many orders on hand.

J. A. Dyer, of Cloverdale, Cal., is now burning a kiln of brick to be used by the Sugar Pine Co. in laying the foundations for the engine and other machinery for the mills.

Jos. Klineman, who has been in the brick business at Hillsboro, Ore., for several years, will go to the mining districts during the early part of this month.

The crown of one of the large pipe kilns at the Pacific Clay Works at Corona, Cal., fell in a few days ago just as it reached the right degree of heat for salting. It was filled with pipe, which will be considerably damaged.

Another kiln containing 225,000 brick is now burning at the Nelson, B. C., yard of the West Kootenay Brick and Lime Co. Eighty thousand brick from the Balfour yard were landed in Nelson a few days ago.

J. R. Cooper is doing a fine business just now at his brickyard at Independence, Ore. He has a large force of men at work on the yard, with contracts ahead for over half a million brick for this summer.

A stock company, composed of six American and two Mexican gentlemen, has been organized in the City of Mexico, with Col. J. H. Hampson as president. The brickyard will be established at Cuernavaca, and the analysis of the clay, which is found in great quantities at the location of the plant, showed such fine results that the contractors for the city sewerage of the City of Mexico have agreed to take 1.000.000 brick as soon as they can be manufactured. The establishment of this yard is an excellent undertaking, as the question of obtaining brick for the sewerage work has been a difficult one ever since the work was commenced. The analysis of the clay indicates that the brick will be of an excellent quality. The company is capitalized at $100,000.

O'Connor Bros. fired a kiln of 150,000 brick at Red Bluff, Cal., a few days ago, and will soon commence work on another one.

John Mitchell, who is in charge of the Henry Hill brickyard at Clifton, Ariz., has on hand 137,000 brick, and will soon have completed 200,000.

A kiln of 280,000 brick were recently burned in the brickkiln of Phillips & Randall at Corona, Cal.

The clay on the Kreigher property, near Pinole, Cal., is claimed to be of exceptionally fine quality. The pottery people have been using it, and it is reported that they are trying to purchase the property from Mr. Kreigher.

Fifty men are now employed at the Patent brickyard at San Rafael, Cal., and more are wanted.

The Weston, Ore., brickyard has now delivered the long expected brick for the new school building at Walla Walla, Wash., and work has again been started on the building. Piles of the Spokane light dial pressed brick for the outside of the structure have been on the ground for some time, but the difficulty has been to get ordinary brick for filling in. The Weston yard now has 650,000 brick on the ground, and no more trouble will be had in getting material for the work. The new Whitman College building will also use the Weston brick.

SUNSET.

OBITUARY.

—Death of George W. Carnell, a Pioneer Brick Machine Manufacturer of Philadelphia.—

George W. Carnell, proprietor of the Philadelphia Brick Machine Works, who has been established in business at Fifth and Germantown avenue for more than thirty years, and who is well known to the clayworkers of America, having been a constant advertiser in this magazine since its very first issue, fifteen years ago, died at his residence, 1849 North Fifth street, on Friday evening, July 7, of Bright's disease. He was in his 68th year. He was born in this city on the site on which his factory now stands, and spent his early years in Philadelphia After learning his trade as a machinist he established himself in business in Baltimore, where he continued until the close of the civil war. On leaving Baltimore he returned to his native city, and began manufacturing brick machinery, which he conducted till his death.

Mr. Carnell leaves a wife and five children. He was a lifelong member of Cohocksink Presbyterian Church, and for many years one of the trustees, a position which he resigned less than a year ago. The deceased was prominent in the Masonic order, being a member of St. John's Commandery, K. T.; No. 4 Lulu Temple, and the Masonic Veterans of Pennsylvania. Other organizations with which he was connected are the Royal Arcanum, I. O. O. F., Lenni Lenape Tribe, No. 3, Imperial Order Red Men, and the Knights of Pythias.

SOMETHING ABOUT BRICKWORK.

THE ORDINARY bricklayer is seldom called upon to lay his bricks in old English bond, or in Flemish bond; at least this is the case when the wall is laid up with common brick. When laid with pressed bricks or Roman bricks the case is, of course, altered. There are times, however, when Flemish or English bond must be employed, and to meet these situations it will be necessary for the bricklayer to be conversant with the various methods of bonding. The ordinary running bond generally employed in this country consists of four or five, generally five, courses of stretchers, then a course of headers to bond or tie the wall together, and, if the wall is only one brick thick, this method of bonding does very well, but, when the wall is one and a half or two bricks or more thick, other methods of bonding should be employed, as shown in Fig. 1, while the face of the wall may show the ordinary running bond. Three diagonal courses may be laid in the wall at regular intervals, and the direction of the diagonals may be reversed alternately. If the wall is very thick the diagonal courses may be laid as shown in Fig. 2, with a course of headers laid over them on the face of the wall and a course of stretchers laid on the inside, the space being filled with cross diagonals.

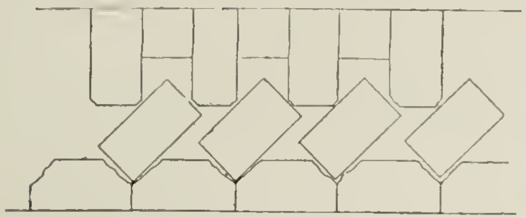


Fig. 1 Diagonal Bond.

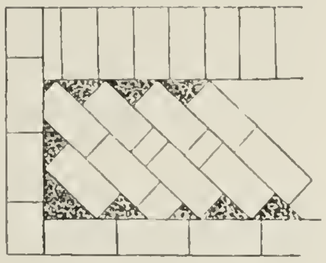


Fig 2. Diagonal Bond

The face of a wall built in Flemish bond will appear like Fig. 3, and the manner of making this wall, when one brick thick, is shown at Fig. 4. This bond is laid with alternate headers and stretchers in each course, the headers being placed exactly over the center of stretchers below it. Closers are used to give the proper lap, as shown by the shaded bricks. English bond shows first a course of stretchers, then a course of headers, and so on throughout, the proper alignment of joint being adjusted by the insertion of closers, as shown at Fig. 5. This bond is a very strong one, and should be used in cases of piers or buttresses that may have to bear great pressure. Flemish bond has the best appearance on the face of the wall, and, when beauty is preferable to strength, it may be used with satisfaction. A wall one brick thick laid in English bond has in one course all stretchers throughout its whole thickness, while the next course is laid with all headers, and so, alternately, until the wall is completed.—Exchange.

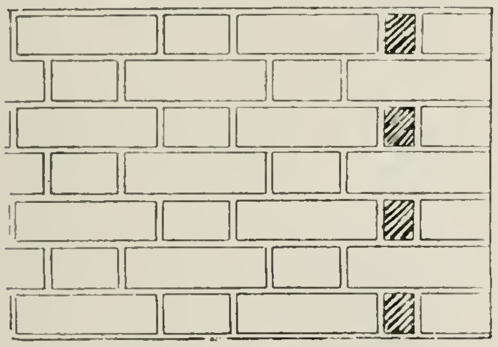


Fig. 3. Flemish Bond.

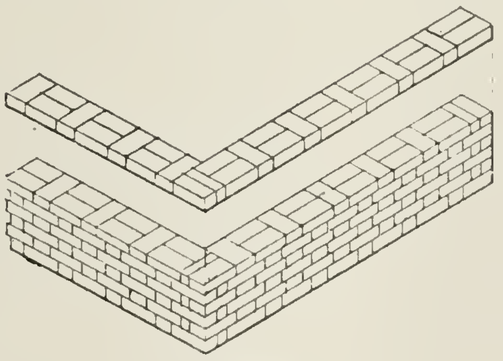


Fig. 4. Flemish Bond.

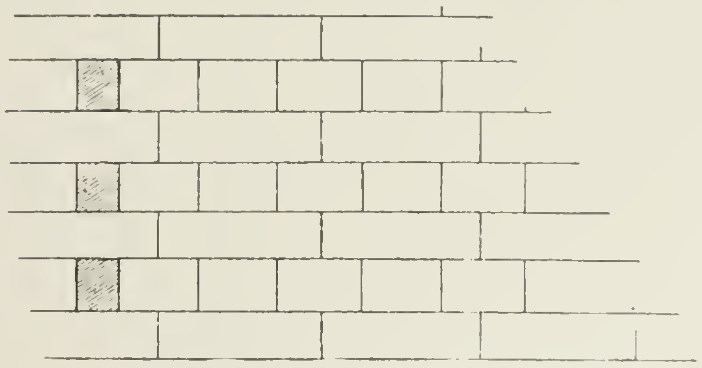


Fig. 5. English Bond.

Tell it Again and Again.

The public has a great deal to remember, and its memory is mighty short. It needs to be constantly reminded of your business. And the man who knew and bought of you yesterday may be dead to-morrow. Meanwhile a youngster who never heard of you is making his first purchase to-day. Don't depend on past prosperity.—Ad Sense.

Written for the CLAY-WORKER.

CLAY PRODUCTS IN THE NATIONAL MUSEUM.

Mexican Pottery and Terra Cotta.*

TO DESCRIBE the magnificent and highly interesting exhibition in the National Museum of objects produced by the prehistoric peoples of the western hemisphere would require months of labor and research, and the result would occupy several good-sized volumes. But a brief and concise description, with some archaeological and historical information, will give the reader an idea of the vastness of the collection. The antiquity of the South American peoples, notably the Mexicans, is almost unthinkable, and probably antedates the Christian era many thousands of years, and is coeval with the peoples of the Eastern and European continents.

This may be readily observed from the close analogy of their implements, forms, designs, materials, models, sculptures, religions, etc. That the prehistoric Aztecs and Incas of the American continent must have had some intercourse with their tribal and nomadic cousin races on the Asiatic continent has been too often explained, and may be best understood by the many analogous illustrations cited above. Indeed, the Aztec hieroglyphics, although at present but vaguely deciphered, may in the future show that the picture language of Egypt was as widely disseminated in prehistoric eras as are the modern languages in our own era.

We can only give in this paper a description of the articles enumerated by divisions in cases and where the objects are numerous and of lifelike design. Four shelves are devoted to ancient objects—first, sculptured images; second, pottery—household utensils; third, implements; fourth, artistic imitations of faces, masks, images of deities and animals. These vary in material, color and design. The total collection comprises upwards of 5,000 objects.

The first collection is in a glass case with seven divisions, each fifty inches wide and 100 inches high. The middle shelf contains the pottery and clay objects, of which some 300 specimens are shown, comprising cups, saucers, bowls, pitchers, decanters, vases, urns, dishes, jugs, jars, ladles, cans, etc. Many of the dishes and utensils are provided with handles; others are poised upon tripods whose legs resemble short stumps. Their colors range from a deep maroon to a black and granite gray hue. Many of the flat discs show three legs of like formation, with wide surfaces. Their ornamentations consist of dark colored line and figure work, both inside and outside. Quite a number of both vases and urns are without handles or bases, and resemble in form the Egyptian, Phoenician and Cypress Island forms. These objects vary in size from one and a half to ten inches in height, and show deft manipulation.

The second exhibit consists of a series of tufa and terra cotta or clay images, comprising about 1,080 objects, such as heads and faces, masks, stamps, ornamental impression seals, rosaries, hemispherical whorls for spinners and weavers, incense burners, with long, hollow handles and serpent heads at ends, and beads of various sizes and colors for stringing together as ornaments. A series of hand vessels, with orifices for dipping the fingers, are shown. The colors vary from white to dark hues, and in size they vary from four to five inches in height. The images are exceedingly grotesque, and many of them, no doubt, were placed in niches as representative deities. Others of this series are statuettes, with regular bases, the figures being clad in prehistoric costumes and the usual plumage. Very many of them are figures of animals, some standing erect, others squatting or reclining. The miniature medallions of faces and masks are, many of them, works of art, depicting most beautiful features, whether of real or imaginary types. A certain advanced state of civilization must have been reached for such figures to have been molded thousands of years before the dawn even of the Christian era. That many of the forms and figures are almost prototypes of Egyptian works of the same character is readily apparent.

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In the third exhibit are found the larger terra cotta vases, comprising some 350 specimens, and named "effigy vases." They are recognized as among the most ancient of the Mexican objects, and were exhumed from the ruins of cities in the State of Oaxaca. These vary in size from four to twelve inches in height, and most of them are in a squatting posture. Some have animal heads on human forms. A few rest upon square bases. The extraordinary formations and embellishments around the heads and faces cannot be easily described, and only a photograph can give a comprehensive idea of the art and skill displayed in the production of such works. There are, indeed, few archaeological exhibits which show so many evidences of prehistoric races and their handiwork as does this exhibit.

In the fourth division the lower shelf has been set aside for the larger objects, and contains by far the most important objects in the exhibit. They are also of clay, terra cotta and earths, with figures so quaint and grotesque as to baffle description. Among these primitive objects are designs of which the modern nineteenth century even has no conception regarding their use or application. The "Orizaba yoke," of which several specimens are shown, would seem to indicate that they were either cast and baked or hewn out of granite rock, for they are solid. One or more are embellished with glyphs, and are of varying sizes, from eight to sixteen inches in height. Some are round, and one or more present flat surfaces. Among other interesting objects are the "gladiatorial stones," plaster casts from the originals in the Mexican National Art Museum, of which two specimens are shown. The many glyphs on the upper discs and around the edges are unquestionably the most artistic designs produced by any prehistoric peoples. In diamter they vary from twelve to fourteen inches on top, and are about three and a half inches thick. The rim especially shows the minutest engraved and sunken figures. These objects were likely given as prizes to the victors in the gladiatorial arenas held at those ancient times. Among the magnificent vessels composed of dark colored clays, some standing as high as eighteen inches, are pitchers, vases, bowls, statuettes, deistic images, masks and children's ornamental rattles. These are all of unique shapes, but of a certain classical aspect from an archaelogical standpoint. A few vessels are lifelike representations of huge snakes and serpents, and for form, shape, coloring and general details, no modern sculptor can surpass them. Some of these models are so deftly shaped that one coil of the body forms a handle. A number of these are life size, and have a truly venomous aspect, although fashioned out of inanimate clay. The rattle snake and boa constrictor species are specially well imitated. The vases and urns shown therein are likewise of a high art design. The most of them rest upon tripods of short stumps, many of them standing twenty inches high, and what singles them out as artistic works are the raised images on the necks, globular bodies and bases. These images are in line with the decorations and fashions of the Aztec eras —that is, decorated with much plumage, pearl-shaped necklaces, large earrings, and glyphs are embossed upon these, possibly designating the name and order or station of the wearer.

In the Lorillard collection the figures and glyphs of these prehistoric peoples have not yet been deciphered. They are similarly reproduced in nearly all specimens. Those taken from the temples and palaces of the Palinque of Yucatan and Mexico, of which many grace the stairways of the Smithsonian Institution in square and round impressions, hang there suspended, together with the colossal images chiseled in stone and elevated upon imposing pedestals. A comprehensive deciphering and translation of the records left by these earliest of American peoples seems not to have been attempted or encouraged by our government; and yet the historical data might be of economic value. If philologists have evinced an inclination to decipher Egyptian hieroglyphics and cuneiform clay tablets, they are certainly derelict in neglecting our probably much older prehistoric American glyphs, of which quite a large exhibit is at their disposal.

The National Museum contains an exhibit of modern clay, terra cotta and earthen objects in colors, which deserves special mention and description. This collection was given to the National Museum in 1877 by Mr. E. Palmer, and shows not only the ceramic art as now pursued in pottery but a modern system, with materials, tools, etc., as executed and performed by the Indians of Guadalajara. It shows, moreover, a complete transition from the ancient crude forms. Thus noted persons of modern celebrity, local scenes, animal life and characteristic scenes are reproduced in clay and terra cotta with such lifelike fidelity as to render them articles of virtu. That they aim at true portraiture is very plainly shown by many of the objects herein described.

A bust of Cura Hidalgo (the Washington of Mexico) is an imposing statuette in civil costume. It stands eight inches high on a square pedestal of white clay. All features are said to be true to nature. The color of the hair, eyes and skin, and even the particular fashion and folds of the costume show the most artistic conception.

A bust of Maximillian, ex-Emperor of Mexico, stands eight inches in height, in regal costume, with all the titular insignia. It stands upon a pedestal three inches in height. The position of the head is striking, and the face seems to indicate a benevolent disposition. The costume is excellently colored, and the features are delineated, even to the minutest details.

A Mexican revolutionary character is a lifelike statuette, standing eight inches high. The face is very stern, and the body is draped in appropriate costume.

A beautiful statuette of Porfirio Diaz, president of the republic of Mexico, stands eight and one-half inches high, on a well-shaped pedestal, and is said to be a true likeness of that statesman.

A bust of Grover Cleveland, late President of the United States, stands eight and one-half inches high, on a neat pedestal. The features are remarkable for their fidelity, even the warts and moles being shown.

All of the statuettes are executed first in clay, not in molds, but as a sculptor would make his first model in clay. When baked the pigment and coloring is applied, and the whole again subjected to heat. For a primitive people to have attained such perfection in art speaks eloquently in favor of the progress and advancement.

A group of gamblers at cards consists of five persons, the faces betokening different emotions. Their postures are so natural and graceful that it well repays close study. This subject is especially typical of Mexican life. Even the exact imitation of the Spanish naipe (playing card) are reproduced. This group is represented as upon a plat of ground about a foot square. Some of the figures are lying flat, others sitting and some in a kneeling posture. Females preparing potions or making tortillas are attentive witnesses.

A toreador astride of a bull is a grotesque reproduction of another familiar feature of Mexican life. The characteristics of both the man and the bull are minutely delineated, and the group is as artistic as real.

Fruit venders and water carriers, carrying their wares upon their heads, in their native garbs, stand from six to ten inches in height, and are true to nature in their forms, features and costumes and graceful attitudes.

A policeman in conflict with a drunkard is a frequent scene. Close examination will reveal the expression of authority in the face of the one and fear in the face of the other.

A kitchen scene depicts a woman with a frying pan in her hand, leaning over an open-air hearth, another type of Mexican life, true to nature in all its details.

A representation of a mother bathing her boy reminds one somewhat of the scene so often depicted.

A series of scenes representing peons (the laboring and vassal classes of Mexico), who are drivers of mules for transporting merchandise over the mountains, show the manner of packing and incidents of the life of the men and the animals alike. These interesting objects are so lifelike and so remarkably typical of these peoples that the visitor is especially attracted to them.

The lower shelf in this collection is devoted to the primitive vessels formed by the ancient Aztecs, of which but a few forms, vases, urns and dishes, are shown. The various kinds of clays and earths are shown, also the few tools required, the pigment colorings and the simple machines for incorporating the clays and other materials, and the miniature kilns and ovens for annealing and vitrifying.

Written for the CLAY-WORKER.

SUPERINTENDENT OR FOREMAN.

THERE SEEMS to be a passing away of the name of foreman and substituting the name superintendent, not but that the majority of men who would make a good foreman would be incompetent as a superintendent, as that office is supposed to be filled. The name foreman is not high-toned enough for some who have had, by good luck, charge of a yard, and, to judge by the work done by them, "foreman" would be a misfit. An agent for a directory asked one of that class of men his occupation. His reply was, "I am a brick manufacturer." The name foreman was not high-sounding enough for him. Such cases reach the long-handled shovel state on a yard early, to make room for more competent men.

The foreman of the past was a hard-worked man. He was always the first on the yard in the morning and the last to leave at night. His value to the boss was in the amount of work that he would do individually, as well as pushing all the others to do all that it was possible for them to do. The yards were not so large, the pit would hold only about eight thousand, one-third as many as the average now—twenty-four thousand. With the increase in the number made, steam came to relieve him of some of his labor. In the olden time the foreman had to look after the sick horses. As each machine required two horses on the sweep, those that were in use were as poor a lot of horse flesh as could be found. The result was that there were some always sick or sore.

—Steam Power—

Was introduced about 1854 or 1855. With it the foreman was relieved from taking care of sick horses, but his duties around the machine were increased. With horses, if anything went wrong, "Whoa!" stopped the motive power. Not so with steam. Run to the engine house and tell the engineer, another hunt up the foreman and have him come to the machine and see what is the matter, as he is supposed to know all about the machine. To-day the moulder is the man to keep the machine going. If a stone gets in the clod cutter or a mold catches, he, with the help of the gang, takes out the front or drops the table, as the case may require. (Speaking of the drop table as used on soft mud machines, it was first used and was the idea of a man who had always been a farmer till he, with his brother, leased a yard and proved successful brickmakers.) If the engineer required any assistance the foreman was the one he went to, not to a man on the yard. He was on the go from sunrise to dark.

Increased output on some yards was like trying to put a quart in a pint measure. He had to have extra hacks in those days; no alley ways were thought of; carry off all loose lumber, and only battens for one side of hack. What to cover the extra hacks with put him in a quandary from which there was only a partial way out, and that was take off the shed boards and make use of them the best he could. The foreman of to-day has a picnic to what the one 40 years ago had. One point was not reached till about the seventies, and that was the number of men employed. The boss did not have so much competition, and his profits were good for those times, and he was satisfied. It was a help to him in getting his green brick off the yard. Those days all brick had to be set just so dry. If they did not get dry enough in the hack they were wheeled off and hacked under shed and set in during rainy weather.

—Brickyard Reminiscence.—

The best men were in demand during the high prices of brick from 1869 to 1871. The foreman who could make good, uniform brick, as well as keep up his work, had the call at $200 per month and overtime, which would make his pay about $260, and was the beginning of more work with less men, as well as weeding out many foremen who were looked up to as the best men in the country. The year 1873 was a trying time to many, as the fall in price of brick had not been fully met by reduction in what goes to make brick, and the men had the call to take the place of some of those who had the credit of burning good brick. When the men they had with them around the kilns were hired on other yards and the "snap," I may say, was broken, it showed who was doing the work. There was one foreman who did not stay around the kilns during the first two nights (during the day, of course, he was on the yard) till the time to heat up, and then he stayed around the kiln till it was out. Go under the shed, night or day, you could see him sitting on a wheelbarrow, the second hand taking charge of the kiln. Wherever he was hired he always wanted to name the second hand—for good cause. The same man had the credit—if it can be called the credit—of the average of six hundred brick to the man, when it should have been nearly double. He became a back number. Younger men have been in charge from year to year. As one looks at the work done now, and compares it with the best of earlier days, the old fellows are not in it. The foreman of to-day, when he has a wideawake boss, has to keep going with the least number of men and keep up his work. What does he do? Well, he has no sinecure by any means; if he keeps his work up he cannot lean against a post or sit down on a wheelbarrow. The man who has charge of a two-machine yard, or one of four, has to look after all the work that is done, as well as burn all the brick. As kilns will run from fifteen to twenty arches he will have from three to four men around the kiln, as he requires them, and when he has no extra men when he is not burning it keeps him as an individual very busy. He will do his best to keep the work from getting too far behind. Between times he will level off kiln ground and start arch or lay down wheeling plank from hack to shed, so that no time will be lost by the men when the pit is out to start to wheel in the green brick. If during the week a boat comes in, she must be loaded, as it does not pay to have four or five men on her doing nothing; so he may have to knock off a machine gang to the best advantage possible. There will be two pits lost, but there is no help for it. The way yards are run at this day there is no way of getting ahead of your work, and running an extra pit now and then as in times past. When from 44 to 46 M are molded per day and thirty- three or thirty-four men are used to do the work, the man who can hold that gait up need not be out of a job. The man who seems to see that things are not going along right for his pocket, and says to his friends that he does not see what his foreman finds for so many men to do when not molding, and does not make any move to change such a state of things, is an easy boss. As he looks on his neighbor's yards on wet days he sees no one at work, while his men, or the major portion, are at work under the shed. As for the boss, he will be busy at something all the time. The forman will be under the shed holding down a wheelbarrow or leaning over a tool box reading a newspaper. It does seem that there would be a strong call for a change. I have seen just such cases, and, too, when the boss was no stranger to the trade. The foreman of to-day on open yards has no easy task, especially where yards are so plentiful as on the Hudson. There are always plenty of men to take the place of any who may die, and I do not think that there is any line of trade where a man has to inhale so much coal gas as it comes from kiln or sweltering around a kiln tending fires, and then probably have to go out on the yard to help batten hacks for a shower and get wet through and have to stay around the kiln for several hours. Long live the name of "foreman," as it is the rightful name, for he has charge of a gang of men, and is so called the world over. ON THE HUDSON.

CORRESPOND-ENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Prosperity Reaches Helena.

Editor Clay-Worker:

I see by the reports in The Clay-Worker that the brick men in most sections of the country are again busy. Trade revival has finally reached Montana, and the building season is opening up here very satisfactorily. Our firm is about to begin on a contract with the city to furnish a large quantity of paving brick to go down on Sixth avenue. This will be the first brick pavement laid in the State I believe. There is also a growing demand for vitrified paving brick for sidewalks. The building season is just beginning. There are a number of large contracts in prospect, of which we expect to get our full share. We booked a contract for about a million common brick to be used in building a large paper mill at Manhattan, Mont., where they will manufacture pulp and paper from barley straw gathered from the famous Gallatin valley, a very rich farming country. Our fire brick trade is very much better than that of last year, and the same may be said of our sewer pipe trade. In the latter line we have furnished quite a large lot of pipe for a system of sewers at Livingston, Mont. As you know, we manufacture a line of flower pots, which we make on one of the Rockwood machines which are made in your city and which does good work and a whole lot of it. The demand for flower pots has been unusually large this spring. We have made a few minor improvements in our brick plant, which is now in excellent running order, and we expect to turn out more building brick this year than for several seasons. The trade outlook is good in all lines, so I hope to make enough of the "needful" by the time the snow flies again to enable me to make my annual pilgrimage to the convention and enjoy another love feast with the good fellows of the N. B. M. A.

Helena, July 7. C. H. BRAY.

Hints on Dry Press Brickmaking.

Editor Clay-Worker:

The Clay-Worker generally is so chuck full of good things that it takes a fellow quite a while to get the whole thing down, and, if he is pushed for time, is mighty apt to skip some really good little letter for something more pretentious. I did that myself, but at another chance I dropped on it. (No, it wasn't Gates's Button Holes. I never miss them.) The letter I refer to this time is a "Brickmaker's Observations on English Brickyards," page 445, May issue. There was a picture on same page which was a credit to both designer and artist, and spoke volumes on the advancement of the brick industry of the South. It certainly was a unique exhibition.

Going back to the letter, which I read twice, I found that, while it really was "English, you know," it hit pretty hard some yards I have seen in our United States. Notice the second paragraph over the leaf, take out the names, substitute some of your acquaintances (perhaps you won't have to go far from your own yard), and it will seem as if made on the spot. There are lots of brickmakers to-day breathing anathemas on brick and kiln men which would be more apt if headed for home. Quantity at the expense of quality! Regulators that are not regulated! If these things were only looked after with as much vigor as the "cussing" is done the latter would soon be obsolete, at least under that head. The evil of making unequally pressed press brick does not end (though it begins) at the machine, but works havoc through the whole circuit. I take it we are talking of dry pressed bricks. Some are over pressed, which means that the bond has been made and broken, and the brick afflicted with "pressure crack" of more or less magnitude. If the machine man notices these they are thrown out at the machine (loss); if not, they go to the setter. If he notices them they are thrown out, probably on the kiln floor (loss of brick and labor), or may be sent back on truck to machine (ditto). If the setter does not notice them he sets them and they are burned (loss of brick, labor and fuel), and finally land on the dump.

Brick insufficiently pressed are even more of a loss than their harder brother, especially if set down in the arch or immediately above it. Not being able (without bond) to support the superstructure, the settle is premature and wasteful. I do not know of any one branch of brickmaking that will run itself successfully, although it has been tried by many people many times. A constant watchfulness from clay bank to consumer is the only straight road to success.

The concluding portion of the letter is, I think, full of brickmaker sense. It may be, and is, easy enough to build a kiln. There are kilns and kilns. The walls may be like sieves, and the throats any old distance apart, or any old size, for that matter. There may be doors or there may not. It's all right, boys; go ahead and burn it, but ,if you get soft heads or ragged arches, or burn too much coal, or fall into any of the numerous pitfalls we have dug for you, somebody "will get it in the neck" sure.

If you want to be in a position to hold your men strictly responsible for their own particular branch, you must first satisfy yourself that conditions are favorable. It is extremely difficult for you to go to a particular man and demand an explanation, or tell him frankly that that sort of thing won't do, when you know in your heart he was not wholly to blame. Get your machinery and kilns in a No. 1 condition, and then your men will know that excuses won't excuse. Your own load will be lighter, and the whole tone of your plant raised several degrees. PRESS.

What Happened to Gates.

My Dear Clay-Worker:

I had intended to spread myself on the work of the "Wizard," which gave such tone to your June number, but the scarcity of the almighty dollar and the necessity of getting together enough pennies to make one must be my excuse for failing to make the effort. I never felt, until I saw the first page of the June Clay-Worker, how much Gates had mistaken his calling. I never realized how beautiful a squaw he would have made. My imagination has run riot, trying to see him in his proper place. Pocahontas, Alfaretta, Minnehaha and the beautiful Indian maidens immortalized by Cooper were not in it with the heroine of your illustration. I glory in her (or his) beauty, and my mind goes on wondering why a full-length portrait was not given. Those of us who know the original need not to stretch the imagination to see her (or him), tall, lithe and supple, with every movement of grace and virtuous dignity. A shadow comes over the picture as still in imagination we go through life with this beautful representaton of the tribe of Button Holes. We see her joined in wedlock to one of the bravest of the tribe and carried away to his wigwam. The years roll on, and again we see her on the tramp through the tangled woods and unbroken forest, leading by each hand a little Button Holer and carrying a still younger one strapped on her back. Time, labor and child-bearing have left their marks on the once beautiful face, and, although still young in years, she is, to all appearances, an old squaw, haggard, wrinkled and evidencing changes which can only come with years of deterioration. Those of us who knew this squaw in her bright Alfaretta days turn back from the end and wish that she might always retain the beauty and freshness which characterizes the picture of her youth and prime. May the shadow of Big Chief Button Hole never grow less. D. V. P.

Chicago, July 14, 1899.

Paving Brick—Room for Improvement—Galesburg Output, Etc.

Editor Clay-Worker:

To one who has been interested in the manufacture of brick for many years, any special branch of that industry is always interesting, and to me, especially, is this true of paving brick, because I studied this branch of brickmaking with a view of engaging in it.

Many improvements have been made in manner of making and burning paving brick, and yet there is room for improvement. This is especially true in regard to some better means of annealing or toughening the brick. The want of this improvement threatens to discredit and limit the use of paving brick very materially. This is so obvious to any one who will examine a brick pavement which has been laid for several years, and on which there is much and heavy traffic, that they will wonder that this essential improvement was not even mentioned at the last annual meeting of the National Brick Manufacturers' Association. The silence of the Association on this very important subject would seem to indicate that improvement in the direction named was either regarded as hopeless or impossible. If this view is entertained, I think it will be dispelled ere long. The life and prosperity of the business depends in a measure on this improvement being made, and it no doubt will be made. I merely call attention to this want that it may receive the thought its merits demand.

I have recently had an opportunity of looking over the several paving brick plants at Galesburg, Ill. The output is about seven million a month. Of this the Purington Company's output is nearly five million. I am informed that during the month of June last 6,061,000 paving brick were shipped from Galesburg. When one remembers that these paving brick each weigh fully seven pounds, some idea may be had of the immense amount of labor required for such an output. Large orders for Galesburg paving brick have been placed from Chicago, Leavenworth, and even Lincoln, Neb. Leavenworth, it is said, needs 28,000,000 of paving brick. The Galesburg paving brick are inferior to none, but the large demand for these brick is not due to their good qualities alone, but to the fact that the Galesburg manufacturers are able to take and promptly fill the largest orders.

The manufacture of paving brick is no "child's play." The outlay for machinery and kilns is very large, and the wear and tear is enormous. This is especially true of the kilns. On account of the great heat required to vitrify that shale the strain on the kilns is enormous. The Purington Company has twenty-seven double-length kilns, equal in capacity to fifty-four ordinary length kilns of forty-five to fifty feet. To keep these in repair requires a small army of masons and helpers.

A very serious difficulty which confronts the manufacturer of paving brick in many places is the presence of sandstone in the shale bank. In one instance it has been found about ten feet thick, with shale above and below it. Another difficulty in many places is the heavy stripping overlying the shale. In one case I know of it is about twenty-five feet thick. The removal of this adds materially to the cost of manufacturing paving brick. In selecting a location for making paving brick this should be carefully considered. The beautiful little city of Galesburg is a striking object lesson in the use of vitrified brick for street paving. About seventeen miles, including the principal streets, are paved with brick, and present a thrifty and well-to-do appearance, and cost about nothing for repairs and but little for cleaning, as the heavy rains do a good deal of this. If municipal officers of other cities needing paving will look on the well-paved streets of Galesburg, if they have any doubts in regard to the use of vitrified brick as a paving material, these doubts will be quickly dispelled. J. K. CALDWELL.

Building Conditions in the South.

Editor Clay-Worker:

The brick trade here in Rome, Ga., is fully up to the average of previous seasons, with promising signs of a rush of orders in the later fall months. Building operations in the extreme South are usually suspended during the summer months, no foundations being placed on account of the fear of yellow fever. This is always felt in the brick trade during the midsummer months, and is followed by a corresponding rush of orders as the season closes.

Both yards are stocking up in anticipation.

The iron furnaces and cotton mills are all busy, those already established running day and night.

At present there is a prospect of two more new cotton mills to be added to the three already in operation and under way. Promoters are endeavoring to start a new cotton mill upon the co-operative plan. The Rome Brick Company agreed to furnish the brick to build the plant, and place the same as stock in the concern. The plan is deserving of commendation, and the Rome Brick Company has certainly made a very generous offer. The low price of cotton retards investments in real property and residence construction. The advance in the price of iron has stimulated trade, and local merchants will reap the first fruits, and building trades will get their share of business.

The South seems to be on the eve of a new era in the cotton manufacturing industry. Should there be no disturbing cause we may fully expect to hear of a general rush southward of the large part of all newly contemplated cotton factories, as was the case with the iron industry a few years back. Cheap fuel, cheap labor and unlimited water power are the prime factors in the cause, with an immense saving of freight rates on all southern trade. The old war cry of proslavery times that "cotton is king" is about to be realized in its fulfillment. Hasten the day, for it enlargeth our borders.

Rome, Ga., July 10, 1899. SOUTHERN.

Ontario and Her Brickmakers.

—Brick Pavements Growing in Favor.—

Editor Clay-Worker: .

I have read with much interest the different articles which have appeared in The Clay-Worker of late months telling of the advantages of brick pavements, and am convinced that no other paving material possesses more merit and fewer objections than vitrified brick. In the various experiments which have been made and reported, I notice that invariably where a test pavement is to be laid that a block is selected which is subject to the heaviest traffic. Trial pavements are never laid on residence streets or business thoroughfares where the wear would be moderate, but instead streets are selected which are subject to the worst wear and tear. Considering the severity of the tests it is little wonder that those unfavorable to brick pavements occasionally find opportunity for adverse criticism. The same would result if any other paving material was laid under similar conditions, and to a still greater degree.

This feature of the paving brick situation is due in a large measure to the brick manufacturer's desire to attract attention by placing his brick in the most conspicuous locations. He succeeds sometimes to his own disadvantage, for, should the pavement show considerable wear during the first few months, as is very apt to be the case, the pavement is apt to be considered a failure, especially by those interested in other paving materials, who are not slow to call attention to what seems to be a poor piece of pavement. Very often the same pavements stand up under heavy traffic for many years, the pavement showing no particular wear after the first few months. I have noticed this several times. I have seen a number of brick roadways which showed as much wear after being laid four months as they did four years later. Taxpayers soon learn these points, and in the long run prefer brick pavements to those made of less durable material. At any rate, such is our experience in Ontario. We have tried asphalt on residence streets, but find it an expensive luxury. In a climate like ours, where the ground freezes to a depth of three or four feet, the upheavals from severe frosts crack asphalt pavements badly, necessitating expensive repairs, and cause a drain on the taxpayer's resources which will prevent that material from becoming popular here. Just now there is appearing a new enemy to asphalt. It is claimed that the gas which leaks from the mains beneath the pavements injures the asphalt badly. The asphalt people have called the attention of the gas people to the fact that the gas is leaking under portions of asphalt pavements which have given out. The gas company denies the charge, and investigations are being made. The taxpayer is sure of one thing, however, and that is that the asphalt pavements, for which he has paid a good round sum, are badly out of repair, and, when he has to foot additional bills, there will be more trouble for the asphalt man. Another thing we are sure of is that neither escaping gas, standing water or freezing and thawing has any harmful effect on a good brick pavement.

Sidewalk brick are coming into pretty general use here. Curbing is invariably of stone. Why is it that clay manufacturers have not introduced a terra cotta curb? Surely it could be made of plastic clay or shale on an ordinary auger machine by using a special die for the purpose, cutting into suitable lengths for convenient handling. I believe such a curb could be made to compete successfully with stone, both as to quality and price.

—Why Not Dry-Pressed Roofing Tile?—

I read with much interest Mr. Tiffany's article in the June Clay-Worker on roofing tile. We have a fine example of domestic made roofing tile made here, not to any extent Spanish. Tile which were made some fifteen years ago seem as fresh and bright in color as when they were first put on the roof. They are nonabsorbent, and every rain leaves them clean and bright. I heard one architect object to this feature. He has seen tile used on the continent which became yellow and mossgrown with age, and wanted to produce the same result here. We might have accommodated him with some soft burned tile, but we doubt if they would stand the rigors of our climate. I once made a few semi-dry clay tile, flat shingle-shaped, and believe that good results can be obtained by that process with good clay. Of those who smile at absurdities I might ask, do you make anything more desirable in texture by present methods than the plain floor tiles? And by the dry process there need be no repressing, an item worthy of consideration.

—Another Sort of Big Indian.—

The transmigraion of souls having been alluded to in your last issue, and as only two have been debarred from discussing it, I feel myself privileged to take a hand. It has been a pious belief with many that the soul did transmigrate, and that it went from the higher to the lower, that all departed clayworkers entered into the white horse. Now a new theory has been brought to notice here by a worker in clay—that he can transpose the soul from the living to his model, and still the model moves, lives and has its being, as much as Big Chief Buttonhole. Had Brother Gates's magician worked in clay, and not wax, which melts and changes; had he the model of the grown, developed manhood of the Indian, instead of the pappoose, he would not have had to use up the whole vocabulary to abuse the fully developed production of the reservation. This magician of ours, with clay, has imparted the soul of his model into his statue of Oronhyatekhu. He has no warpaint or feathers, but is attired in the everyday garb of a gentleman, button holes and all. When you met this big chief, be it in his Temple building, from where he governs the largest insurance society in the world, at his wigwam, at his Foresters' Island Park or in his secluded private mansion among the pines, you feel you are in the presence of one of nature's gentlemen, polished by education and endowed by nature, which must have deep food for reflection for Uncle Sam, and one asks how in Canada the Indian takes his place among the best, while in the States he has degenerated, for, if only half as bad as described, he must be low indeed, while in Ontario every Indian is a brick and naturally a red one, too.

While Ontario is a wooden country, self-preservation is teaching every city to enlarge its fire limits, restrict the territory from erecting wooden buildings, necessitating those who otherwise would not use brick to do so.

While our republican neighbors are endeavoring to produce a style of architecture that may be known as distinctly American, though not up to the expectations of a new order of architecture, we are endeavoring with our means to imitate the best, quite regardless of any national sentiment, with confidence in ourselves, like our cousins of the Windy City, to have the best, and, as far as possible, to do so without precedent, if found desirable. The cities of Ontario have gone through the boom days of shoddy, and our builders are starting now on solid bases to develop the substantial and the artistic, into which must enter the product of our kilns—burned clay.

M. JAY.

Philadelphia Notes.

Editor Clay-Worker:

The terra cotta works of William Galloway, located at Twenty-third and Walnut streets, described and illustrated in the April issue of The Clay-Worker, was almost totally destroyed by fire on the morning of the 25th ult. The recuperative qualitites of Mr. Galloway's makeup did not permit him to stand and mourn his loss. With Spartan-like courage and activity he, on the following day, Monday, commenced the erection of a new shed, 40x80 feet, and by 10 o'clock had started half a dozen men making molds. One pleasing incident marked the otherwise forlorn situation—the kilns remained intact, and, hastened by the fire, he was able to draw the contents and thus continue the shipments of his orders, which embrace the terra cotta details for three large office buildings, some work for the Paris Exposition, and a large amount of work for the Paris Export Exposition to be opened here in September.

It has been decided by the City Council that out of the sum provided for the repaving with asphalt, Belgium block, etc., of the streets of Philadelphia the following named streets shall be paved with vitrified paving brick: Atlantic street, from Eighteenth street to Nineteenth street; Bexley street, from Pulaski avenue to Morris street; Bryan street, from Durham street to Mount Pleasant avenue; Budd street, from Ogden street to 200 feet northward; Durham street, from Germantown avenue to Bryan street; Dyre street, from Frankfort avenue to Willow street; Fleming street, from Dupont street to Leverington avenue; Hagert street, from Twetny-sixth street to Twenty-seventh street; Howarth street, from Frankfort avenue to Willow street; Orkney street (unpaved portion), from Clearfield street to Indiana street; Osceola street, from Haines street to Center street; Silverwood street, from Leverington avenue to Gates street; Seventy-first street (unpaved portion), from Greenway street northwest; Thirteenth street, from Butler street to Pike street; Upland street, from Seventy-first to west line of Seventy-first street; Wakeling street, from Frankfort avenue to Willow street; Washington lane, from Germantown avenue to McCallum street; Winona avenue, from Morris street to Laurens street.

ANON.

Anent Big Chief Button Hole.

Editor Clay-Worker:

That was a very pretty picture on the first page of your June number. Don't tell me it's Gates—it's too good looking. But if it is Gates, he had better dress that way. When I saw it I said, "That is the handsomest Indian I ever saw." But say, Randall, did you ever see a curly-headed Indian? You might as well try to curl a horse's tail as their hair. Can it be that Gates has missed his calling? I would go a long way to see him play the part of Minnehaha. Any how, Chief Button Hole is a good Indian, and we are not prejudiced against him on account of color.

I. SMOKE.

ST. LOUIS NOTES.

WHILE GENERAL LINES OF TRADE seem quite active, the building trades here in St. Louis are rather sluggish, and the brick business is not nearly so good as our brickmakers would like to have it. The weather has been more favorable lately, and consequently most of the yards have harvested a good supply of clay, and will continue to add to the pile under the sheds until enough is under cover to run the balance of the season.

The Ittner yards at Belleville are running to full capacity, and they are building additional clay sheds, which, when stocked, will insure them enough dry clay to run right along, regardless of the weather. Warren, Anthony Ittner's youngest son, has returned from the School of Ceramics at Columbus, O., where he acquitted himself with much credit, and has taken entire charge of both plants. His elder brother, Ben, who has been superintendent of the works for several years, goes to the city office to help in the sales department. It is rumored that the latter will soon take unto himself a wife.

As has been stated, the Hydraulic Press Brick Co. have either leased or reached an agreement with all the yards in St. Louis, except the Progress Brick Co. and the Sanders Press Brick Co. Prices are more stable as a result, and average as follows: Merchantable, $6.25 per M; ordinary, $6.75 per M; strictly hard, $7 per M.

It is claimed that the companies not in the "combine" are taking an unfair advantage by cutting these prices 25 cents a thousand, thus getting more than their share of the sales, though they make less on what they do sell.

The stock market is more satisfactory, red stock brick selling for $15, whereas they were selling for $10 per thousand two months ago. A more active demand will probably set in soon, when a more cheerful lay will reach you.

The fire brick sewer pipe and terra cotta industries report their trade good and most of them behind their orders. Prices in these lines have also advanced, and the outlook bids fair for a more prosperous year than any of them have had for some time.

James Walton, for several years fireman for one of the hydraulic yards, goes to Omaha as superintendent for the Omaha Hydraulic Press Brick Company. He has well earned his promotion.

The world's fair scheme has gone too far now to fail, but it is hard and up-hill work getting subscriptions for five millions of dollars. The first two million was easy, but the committee are now working hard for every gain in the subscription list. Brick men generally are counting on the impetus this fair will give the trade. Contracts for public improvements are tied up on account of a recent decision of the United States Court releasing property owners from paying full assessments made against their property in special tax bills. Some of the contractors here agreed to go ahead with contracts and take chances, but the work don't seem to start. The strikes all seem to be over, and we hope to give you more encouraging news when fall trade begins. A SAINT.

BRICK PLANTS COMBINED.

Twenty-two Local Concerns Are Absorbed.

The details for the combination of the brick manufacturing plants of Baltimore by Boston and local capitalists are nearing completion, and an authoritative statement is to be issued at an early date. There are twenty-two plants in the combination, embracing all local brick manufacturers. These concerns have a total annual capacity of about 200,000,000 of bricks, and their product ranges from the finest pressed brick that sells for $15 a thousand to the cheapest salmon article. The finer grades are shipped to various parts of the country, and Baltimore pressed brick is frequently specified for important buildings in the larger cities of the United States, even at a higher cost, in preference to local bricks. It is authoritatively announced that there will be no advance in prices on account of the combination.

The stated policy of the combine is, by economical management of the various properties, to reduce the cost of production so that lower prices can be made and the consumption of brick increased. It is from increased production and the economies of a centralized management that the combine hopes to profit. Just now there is a heavy demand for bricks, and the various plants will be worked to their full capacity so as to keep up with orders and work up a surplus stock. When this is done it is contemplated to close the smaller yards, which cannot be worked economically and concentrate the machinery at plants better adapted to producing brick at the lowest cost. It is also contemplated to build a supply depot in the northern annex, where the various grades of bricks used in building will be kept on hand to meet demands.

Mr. Joseph R. Wilson, president of the Baltimore High Grade Brick Company, will be the general manager of the combination. Mr. Wilson has spent most of his life in the brick manufacturing business, and is recognized as an authority. The company which absorbs the brick companies is known as the Baltimore Brick Company, and was chartered under the laws of New Jersey, with a capital stock of $2,100,000. —Baltimore Sun.

ASPHALT PAVEMENTS AN EXPENSIVE LUXURY.

Last year the city of Buffalo expended the sum of $85,560.58 for asphalt repairs. This year the Board of Public Works asked for an appropriation of $120,000 for repairs. The Common Council has cut that amount to $90,000, and there is a good likelihood of a deficiency in the appropriation.

The statement concerning the asphalt pavements of Buffalo in last evening's Commercial must have awakened the community to a realizing sense of one or two important facts.

One of these is the inordinately heavy burden of expenditure the taxpayers are bringing upon themselves by the policy of drift, grumble and do-nothing, which is about the most effective check the Barber Asphalt Company and its brood of off-shoots has ever had to deal with in Buffalo. Another interesting feature is the short life and expensiveness of the asphalt pavement itself. Still another, is the apparent inability of any company to guarantee a good job for the large sum of money the owners of property have been induced to put into asphalt pavements.

Some pavements are good, some bad, some indifferent from the start, but nearly all require extensive repairing inside of eight years, and about as soon as the company's guarantee expires the unfortunate taxpayers are confronted with the announcement by the city officials that it is better economy to lay a new pavement than to repair the same, "as it is evident that with the last prices received for resurfacing, the cost of maintaining exceeds the cost of a new pavement." If the eighteen streets affected by this statement are resurfaced the abutting property pays the cost by local assessment. If the pavement is "repaired"—ineffectually patched two or three times in a season—the cost is heavier, but it is a charge upon the general fund and tends to swell the too large tax rate. That is the municipality's dilemma. It is awkward for all concerned, apparently, except the Barber Asphalt Company, which has what is called a "cinch" on this community.

The situation would not be so irksome if the city officials had held the asphalt companies to sterner and stricter account. There are pavements in this city—every man who drives or rides knows them—that the companies should have been forced to relay inside of six months. There are scores of others under "guarantee" which they have neglected to keep in good condition. The result is that taxpayers are now about to deal every year with some thirty miles of pavement that will cost more to repair than to relay!

What is the remedy? Asphalt pavements are a luxury, and they come high. Are they not coming considerably higher than the average householder can afford?—The Buffalo Commercial.

THE "HERCULES," THE "BEST SOFT-MUD MACHINE."

The following letter from Minear Bros., well-known brickmakers, Iowa, is self-explanatory. The Hercules is pictured on page 78 of this Clay-Worker. The manufacturers will take pleasure in explaining its merits to any of our readers who will write them about it:

Horton M'f'g Co., Painesville O.:

Gentleman—Thinking you would be pleased to know how we are getting along with the Hercules and Mold Sander, will say that we have been delayed somewhat on account of rainy weather this spring, hence could not run very steady. We wish to say that we are well pleased with the machine. It makes nice, square brick. We think the Hercules the best soft-mud mill on the market. The Sander is working fine. Inclosed please find balance of settlement.

Respectfully, MINEAR BROS.

DesMoines, Ia., June 6, 1899.

THE CLAY-WORKER

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SIXTEENTH YEAR OF PUBLICATION.

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CURRENT COMMENT.

There is a marked falling off in building throughout the country, owing to the increased cost of all bulding materials, but chiefly of structural iron. In one way this lessens the sale of brick, while in another way it may tend to increase the demand.

* * *

The scarcity and cost of steel has caused the postponement of the erection of many large buildings—"sky scrapers"—which cannot be built without it, and may encourage the building of smaller structures, which can be built of masonry construction alone.

* * *

There is an abundance of capital seeking investment, a large portion of which is sure to be used in building. If tall buildings are too expensive to promise a reasonable interest on the investment, this capital will find its way into another class of building till such time as steel can be bought at reasonable prices.

* * *

This time may come much sooner than many think. The productive capacity of structural steel manufactories is being increased every day. On the other hand, purchases are made only by those who cannot do without it. Great production on the one hand and restraint of buyers on the other will surely check the upward tendency of prices. In our judgment the manufacturers who sell steel at the present prices for delivery next year will make more money than those who hold off.

* * *

Some of our brick friends regard tall buildings with disfavor, for the reason that the steel structure requires less brick than the old-style building. While this is true, it is just as well to view the situation philosophically. The tall building has come to stay. It must be built of steel, for sky scrapers are commercially impossible with mere masonry walls. Tall buildings and steel construction are facts, not theories, so brickmakers might as well submit to the inevitable gracefully.

* * *

Instead of wasting one's breath deprecating tall buildings it is much wiser to use it in advocating the extension of fire limits and the restriction of the building of frame structures. In this way brick men may promote the best interests of their respective communities and at the same time increase the demand for their products—certainly desirable ends and none the less commendable because actuated by personal interest.

A SPLENDID STRUCTURE.

We think our readers will find the Cleveland Chamber of Commerce building, which is illustrated on preceding pages, worthy of more than a passing glance. There are few buildings in the country, or the world anywhere, for that matter, that compare with it for elegance of design and perfection of execution. The ornamental details are remarkably bold and beautiful, and, being executed in terra cotta, demonstrate the superiority of burned clay as a building material when patterned by a master hand. It is a splendid monument to the clayworking art.

FIRE-PROOFING PRICES.

Through competition which has been developed through cement fireproofing hollow tile fireproofing has come to meet the prices of this inferior product. While the necessity for meeting the prices of an inferior product with a superior one is to be regretted, nevertheless it must be known that the conditions were such that this has been made almost a necessity. The owners of buildings have not been so anxious that they should be made fireproof as that they should be regarded as fireproof. The average owner of rental property is merely anxious that his buildings should have a reputation as fireproof. The fact does not concern him seriously. Thus, through changes in methods of manufacture and sale, hollow tile fireproofing of good quality has come to take the place, on grounds of equal cost, of an inferior material.

TRUSTS AND BRICKMAKERS.

We were saying to a friend of ours recently that the question of trusts did not concern us; that with the brickmakers we did not see that the trust was a possibility. The gentleman is familiar with this question, and what he said may be of interest to the readers of The Clay-Worker:

"The brickmakers are a good deal nearer a trust, as this misnomer is understood, than they were ten or fifteen years ago. The use of the word trust, as applied to the present organizations which are formed under this name, is a misnomer, and altogether confusing and misleading. The organization of to-day is not the trust of a few years ago, which was a body organized for the purpose of controlling competition. The organization of to-day practically does away with competition through the means of absolute ownership, and is a body difficult to get at through law or other means without absolutely disturbing private and public rights. The organization of to-day—call it trust, if we must—is simply a large business organization, founded, conducted and managed according to the same general principles as any one of the smaller organizations of former years. Laws may be passed, political parties discuss, and we all may think what we will about this question. It is a great public movement, and, without discussing the question of the merits or demerits of the system, it has come to stay. We must accept it. The man who fights it, who stakes his capital or his time against it, is butting his head up against a wall."

"What do you mean by saying that the brick business is nearer the form of a trust than it was fifteen or twenty years ago?" we asked.

"I mean this: There are relatively more large establishments in existence now than there were in times past. The price of brick is so low that they cannot be made at a profit by the smaller establishments. I mean that this condition will continue; that the number of large establishments will increase, and that in the natural course of events, through the movement of this great business current, there will be a few mammoth organizations controlling the brick business of America. To my mind it is a question which admits of no argument. The idea is an avalanche."

"Do you not think that this immense capitalization will be fatal to the trusts—that they will fail through their own dead weight?"

"Why so?" he answered. "Has this destroyed other mammoth organizations? Have the railroad companies of the world gone out of business on this account? Have the steamship companies divided for this reason? Of course, we all understand that a great deal of this stock is mere paper, and, if it cannot be made to pay, it will go just like other paper. It will be wiped out. This is the water which is in every organization of that character. Sometimes it is worth something, and sometimes it is not. It goes for whatever it is worth. Of course, there will be liquidation, but the business will still be there, and will, in the end, survive on its legitimate basis."

While we do not subscribe to our friend's views as a whole, his ideas are worthy of consideration. We will hear much of trusts during the coming months, and much that we will hear will be rant and rot of the worst sort. We advise our readers who are worried by this trust specter to keep cool and reflect occasionally on the abiding truth of Garfield's memorable words, "God reigns and the government at Washington still lives." We will not all of us go to the "demnition bowwows," even if New Jersey continues to authorize certain schemers to incorporate stock jobbing concerns.

THE EVOLUTION OF THE BRICK PAVEMENT.

Those of our readers who are directly interested in brick pavements, and we are all of us interested at least indirectly, for the paving problem affects every property owner, will find food for thought in Mr. Durant's instructive paper on "Chicago Pavements" in this issue. Students of this subject are beginning to understand that we have much to learn about laying brick pavements. Heretofore the question of the quality of the brick has been paramount, and little attention has been given to the manner of laying them in the street. The manufacturers of paving brick have demonstrated fully that first quality of paving brick are more durable than other competing materials. The only serious objection to brick pavements is that they are rough and noisy. It is now dawning upon us that these features are due to faulty methods of construction, and not to the nature of the material. It is being demonstrated that if brick pavements are properly constructed they are neither rough nor noisy, but, on the contrary, wear smooth and clean, making an ideal pavement. The quality of a pavement depends more on the manner of laying than the quality of the brick. This may sound queer, but we believe our correspondent will demonstrate it clearly in his next paper, in which he will describe brick pavements that wear smooth, illustrating with views of pavements that after years of use are perfectly smooth, the edges of the brick showing no signs of chipping. We have learned how to make good paving brick. Now we must learn how to lay them. The lesson will be outlined in the next Clay-Worker.

A MIDSUMMER MEETING OF THE AMERICAN CERAMIC SOCIETY.

The first midsummer meeting of the American Ceramic Society occurred at Cleveland July 4, and the programme as announced in the June Clay-Worker was carried out. Returning from the meeting Prof. Orton writes:

"We had a royal good time, and I think the summer excursion will be a fixed feature in our work from this time forward. There were no papers; nothing but informal talks, committee work and discussion, but we did not get nearly through after three days of it, so you can imagine that things did not drag with us. There were thirteen members present out of thirty-one, which I think is exceptionally good for the first time."

A special representative of the Clay-Worker was in attendance and will make a detailed report for our next issue, having been unable to complete it in time for this number.

The next meeting of the American Ceramic Society will be held the coming winter just previous to the N. B. M. A. Convention, and at the same place, of which full announcement will be made in due time.

BRICK CROSSINGS.

The law makers of the thrifty city of New Albany, Ind., have passed an ordinance licensing vehicles, the proceeds of which will net the city in the neighborhood of $2,000 per annum. The city engineer says the money is to be used to make brick street crossings to take the place of the present two rows of stone, which are nerve racking and vehicle breaking. A brick crossing costs about $30, and the fund derived will make some sixty-odd street crossings, so it will be but a few years until every crossing in the city will be made of brick.

BETTER WAGES FOR LABORERS.

During recent months prices paid to labor have been increased in all lines. This came about, of course, through improved business conditions, through advance in prices and the not unjust demand of labor itself. Happily, this changed condition has come about without friction in the form of riots, boycotts or other struggles of like character. It is to be noticed that when it is possible to meet the demands of labor without loss it is done without friction, and that only when demands are made on a falling market are labor adjustments accompanied by serious struggle.

GLASS HOUSES OF GLASS BRICK.

According to an item now going the rounds glass houses are the latest scientific improvement in the building world. It is claimed that glass can be manufactured into bricks that are almost as cheap as the ordinary clay product and are far more durable and healthy. A glass brick is practically indestructible. It will not absorb damp or poison, and it is absolutely noncombustible. But perhaps the greatest advantage of all is that glass is the best nonconductor known, and a glass house or barn ought to be safe from electrical storms. A writer in a French journal describes a room in a glass house built in Brittany, of tinted translucent blocks, and speaks of the sedative influence of the pale green light that came through the walls into the study, producing, he says, the same calming effect that one feels in a glen where the light is transmitted through tender leaves. But, after all, a glass house with an electric light in it rather gives a retiring man a shiver, to say nothing about a retiring woman.

STILL DOING BUSINESS AT THE SAME OLD STAND.

The business conducted under the name of R. B. Morrison & Co. in the sale of Morrison's improved brick kiln and hot floor drier plans will continue at the old stand. The death of Mr. Morrison, the senior member of the firm, will not interrupt the business, and all parties contemplating the building of kilns or driers are invited to correspond with them relative to the same. See our advertising pages. Consult index.

BRICK VENEERED BUILDINGS.

In our March issue a subscriber in Clayville (T. C.) took exceptions to some remarks made by a correspondent who had denounced "veneered" houses as "shams and frauds," and he ended his communication with a request that he would like to have the opinions of those of our readers who had any experience in the erection of this class of buildings. Since then we have received several letters on the subject, some favorable, some unfavorable to the "veneered system," and in a future issue we will endeavor to condense these communications and submit them to our readers. The subject of "veneered houses" is an important one, and deserves the attention of builders to a greater extent than now obtained.

It has never yet been satisfactorily settled whether a veneered house has any decided advantages over the solid-wall house in cost, efficiency or comfort.—National Builder.

COLOR PHOTOGRAPHY.

Boon to Potters if It Proves Practical.

The potters of Trenton, N. J., are being solicited to experiment with a new process of photography, invented by Mr. John A. Taylor, by which a photograph may be taken of a flower, a landscape, or in fact any object, and when finished all the natural colors are brought out as in real life. No after coloring with a brush or pencil is needed, the camera taking the colors as they appear. The patent and rights are owned by Parker L. Walter, of New York city.

The invention will be valuable to the potters in many ways. For instance, a photograph may be taken of a beautiful decorated piece of ware, and the result will show all the colors, making a valuable picture for sample uses. Mr. Taylor has several samples which are unusually brilliant, the colors being very lifelike. One is a photograph of a woman, showing the complexion and dress effects; another is of a group of the inventor and his friends standing on the board walk at Atlantic City. In both cases the tints are lifelike and perfect.

Whether the present method can be used by amateur photographers cannot be learned, but there can be little doubt but that the time will soon come when the "man with a box" will catch nature as she is.—Trenton Times.

ADVANTAGES OF GOOD PAVED STREETS.

The industrial and social effects of paving a city are of great importance. Paving the streets to some extent reduces the price of material hauled over them. On a well-paved street the traction may be perhaps but one-sixteenth of that on a dirt road, and in case of bulky material, such as coal, where the cost of local delivery is a considerable item, the saving due to the larger loads which may be hauled is reflected in the retail price. It is, however, from a sanitary point of view, that paved streets are most desirable. Smooth, clean streets are almost necessary to the health of a community. The prevention of the accumulation of filth and the corresponding decrease in disease is one of the chief benefits of paving. When a city is paved with brick and its sewers are laid with the same material, the streets may be cleaned with a stream of water from a fire hose without fear of the sand cutting either pavment or sewers. A small gang of men may thus clean a large area in a short time. Attractive streets serve to draw trade, and of two similarly situated towns, one paved and the other unpaved, the former will have the advantage. Well-paved streets stimulate municipal interests and civic pride. When the people have paid for having their streets put in good condition they feel an interest in keeping them so. Franchises for street railroads or for any enterprise requiring the tearing up of the streets, are scrutinized with greater care, and almost invariably a provision is inserted prescribing that the corporation using the street shall help pay for the paving. In Iowa, for example, street railroads pay for paving a strip seven feet wide. This is an important aid in fixing the principle of compensation for public franchises.

The impetus given to the social life of a town by the paving of its streets is marked. The people go about more and become better acquainted. The clean, smooth streets tempt the pedestrian, the bicyclist and the driver alike. They make it possible to hold carnivals and similar outdoor festivities.—Review of Reviews.

CHICAGO BRICKMAKERS SUED.

For alleged boycotting and blacklisting, George Hinchliff, once prosperous and well known to the brick trade, has instituted suit in the Circuit Court for $100,000 damages against the Chicago Masons' and Builders' Association, and a number of the largest brick manufacturers of the Windy City.

Hinchliff alleges that up to two years ago he was the owner of one of the most lucrative brickyards in the State. He was approached by a committee of members of the defendant association, who ordered that he join their association. He alleges that he refused. Then, he says, they caused him to be blacklisted in such a manner that the bricklayers' union, according to an agreement with the defendant association, would not use any brick furnished by him.

For the past two years, he asserts, the fight has been kept up, with the defendants endeavoring to drive him out of the trade.

Hinchliff says that his business has been ruined, and that if it had not been for the action of the defendants he would have been able to make at least $100,000 in his business, the amount for which he sues. D. V. Purington, William Alsip and others are made defendants in the suit.

It is rumored that a number of other suits of a like nature will be started soon against the same defendants.

J. D. Pratt writes that he contemplates organizing a company to manufacture brick at Marshall, Wis., and would like catalogues of brick machinery.

W. H. Hoagland, who has been managing the Cayuga (Ind.) Pressed Brick Co. for a number of years, has severed his connection with that company to accept the position of general manager of the Findlay Hydraulic Press Brick Co., a branch of the great St. Louis Hydraulic Press Brick Co., and henceforth will make Findlay his home. The Cayuga company has prospered under his management, which, no doubt, explains his "call" to Findlay.

The Eastern Machinery Co., New Haven, Conn., write that their trade continues very satisfactory. They are still behind their orders, not only in their brick machinery department, but in all other lines as well. Among the special machinery they build is a line of friction clutches, which are now used all over the country, and of late they have been shipping them to Europe. Their sales of brick machinery aggregate three or four times as much this spring as last, indicating that the "New Haven" soft-clay machine steadily gains in favor wherever used.

Written for The Clay-Worker.

THE THING THAT FLOORED HIM.

He knew it all.
He could tell just how to run a boat, a brickyard or a bank.
He could tell just how to make a toy, a tip cart or a tank.
He could analyze a hornet's hive, a hog pen or a house.
He knew the different structures of the mastodon and mouse.
He could explain a lightning rod or run a dynamo.
He could make it rain in winter, and in summer make it snow.
His fund of useful knowledge was on tap to great and small.
He knew it all.

He knew it all.
He knew why some were born to rule and some were born to toil.
He knew why one had carbuncles, another had a boil.
He knew what the gold standard meant, and why it was a curse.
He knew about free silver, for it had escaped his purse.
He knew about the Spanish war, and he could tell just why
The world was bound to burst itself and wither up and die.
He knew all this and more—much more—it really did appall.
He knew it all.

He knew it all.
He knew just why the rich got rich and why the poor were poor.
He knew why patience brought success to all men, safe and sure.
He knew why hell did not exist and why the gospel lied.
He knew just why the doctors cured and why the patient died.
He knew just why the earth was round and why the seasons came,
And when he got to things like that 'twas just an easy game.
He knew—but why go farther? His think tank had the call.
He knew it all.

He knew it all.
He knew the simpler things the best. 'Twas just like breaking sticks.
He knew the surest Klondike was to turn to making brick.
He knew, with all his knowledge, 'twould be sunshine all the way.
He knew a holy fortune lay in just a-baking clay.
He knew just how to mix the clay and what machine was best.
He knew that when the kiln was fed the fire did all the rest.
He knew too late his one mistake. The epitaph was small:
"He knew it all."

OH, I DON'T KNOW.

Don't you kinder hate the feller
That's the hull dern show?
The chap that ain't got nuthin'
More on earth to know.
He does his talkin' mos'ly
'Thout his brain's advice—
The feller with the habit
When you tell a tale to stab it
With
"That cuts no ice!"

Don't you kinder hate the feller
That's a firs'-class peach?
Thinkin' he's the on'y pebble
On a long, wide beach!
He tries to pose as knowin',
But his brow won't grow—
The feller with a habit
When you tell a yarn to jab it
With
"Oh, I don't know!"

—Baltimore American.

Mrs. Smith: "Mrs. Jones is mighty stuck up, all of a sudden. She says, now her husband is a millionaire, she's going to move into more aristocratic quarters."

Mr. Smith: "Her husband a millionaire! How's that?"

Mrs. Smith: "I don't know. Mrs. Jones said that when he rushed into dinner after a visit to Clinker's brickyard. He quit with the tea and said, 'Maria, I must rush to the Exchange; I'm solid for two million, at least, and that means that I've got the hand on the other contractors.'"

Mr. Smith: "Happy man! Indeed, he is a millionaire, but his millions are counted easily."

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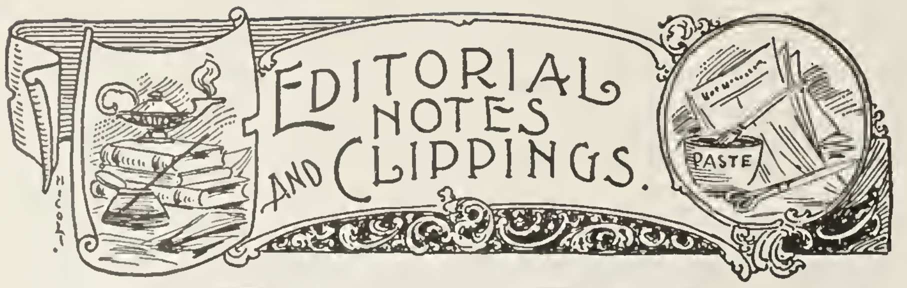
For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

Books for... Brickmakers.

"CLAY GLAZES AND ENAMELS,"
Henry R. Griffen, C. E. $ 5.00
"BRICKMAKER'S MANUAL,"
Morrison and Reep, 3.00
"BRICKMAKING AND BURNING,"
J. W. Crary, Sr., 2.50
"TABLE OF ANALYSES OF CLAYS,"
Alfred Crossley, 1.00
"VITRIFIED PAVING BRICK,"
H. A. Wheeler, E. M., 1.00
"PRACTICAL FARM DRAINAGE,"
J. J. W. Billingsley, 1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.



Salina, Kan., is to have a new brick and tile plant.

Neuhaus Bros. have started a new brickyard at Baker City, Ore.

The Love Wagon Co. will establish brick works at Durand, Miss.

A new brickyard will be opened up at East Pine, Ore., by Hulse Bros.

Mr. Bawser, of Helena, Mont., will start a brickyard at New Salem, N. D.

A new brickyard has been opened up at Spokane, Wash., by Mills & Beneke.

Pearson & Ashe, of Asheville, will establish brick works at Chapel Hill, N. C.

J. B. Carrothers and R. R. Johnston have purchased the tile factory at Tiro, O.

Noah Snyder, a well-known brick manufacturer of Milton, Pa., died there July 7.

C. C. Buchanan, jr., of Dewey, Fla., is in the market for brickmaking machinery.

Etzwiler's brickyard at Mansfield was damaged to the extent of $200 by flood recently.

Fire in the brick plant of William Winter, Hagerstown, Md., caused a slight loss July 3.

A brickyard will be started at Hamilton, N. D., where there is a good demand for brick.

The burning of a kiln shed at Hutchinson's brick plant at Toronto, Can., caused a damage of $300.

Beston & Kelly sustained a slight loss by fire in the kiln sheds at their plant at Springfield, Mass.

The Glouster Clay Co. has been incorporated to manufacture brick at Glouster, O. Capital stock, $10,000.

D. A. Valentine is interested in a company being formed for the manufacture of brick at Clay Center, Kan.

T. A. Habel is making improvements in his tile factory at Daleville, Ill., putting in additional machinery.

The Sterling Kaolin Co. has been incorporated at Graniteville, S. C., by J. B. McMillan and John M. Posey.

A cave-in at a clay pit at Evens & Howard's plant at St. Louis resulted in the serious injury of three of the employes.

The J. V. Rose Brick Co., Sharon, Pa., granted their employes a voluntary increase in wages as a Fourth of July present.

The Elyria (O.) Brick and Tile Co. has been incorporated by E. C. Manter, E. T. Andress and others, with a capital stock of $50,000.

The tile factory and sawmill of T. L. Goble, east of Haviland, O., was totally destroyed by fire June 29. Mr. Goble will rebuild.

M. Sheridan, H. S. Wickware and D. K. Janes are interested in a company that has been organized to manufacture brick at Caro, Mich.

The Massillon (O.) Stone and Fire Brick Co. recently gave their employes a voluntary 15 per cent. raise in wages in all departments.

The new pottery of T. L. Hahn, of Augusta, Ga., is fairly under way, and Mr. Hahn is turning out a good grade of jugs, flower pots, etc.

The Salisbury Brick Co. are putting one of C. W. Raymond & Co.'s brick machines of 35,000 daily capacity in their plant at Salisbury, Md.

The Malvern (O.) Clay Co., whose plant was destroyed by fire a couple of months ago, resumed operations the first of the present month.

The brick plant of M. L. Williams & Co., Coopersdale, Pa., is undergoing extensive improvements that will greatly increase the output of the plant.

The Prospect Pottery at Trenton, N. J., owned and operated by C. H. Cook, was damaged by fire to the extent of $2,500 early in the month. Only the prompt and efficient work of the local fire department saved the entire plant from being destroyed.

The Quincy (Ill.) Brick Exchange has been dissolved by mutual consent of parties interested. The Exchange was organized in January, 1896.

The Star Brick Co., Warren, Pa., has been incorporated by W. W. Winger, F. E. Windsor and A. J. Hazeltine and others, with a capital stock of $15,000.

The Macclesfield Co. is the name of a new firm incorporated at Tarboro, N. C., to manufacture brick and tile. John Bridgers, Job Cobb and others are interested.

The Minor Brick Works, Steubenville, O., until recently operated by hand, have put in a brick machine and pug mill, thus doing away with hand-made brick.

Peter Zeigler, one of the pioneer brick manufacturers of Wilmington, Del., passed away, after an illness of some months. He leaves a widow and four children.

C. B. Chase, of Channahon, Ill., writes that he has found a very fine deposit of clay at that place, and is now experimenting with a view of putting in a brick plant there.

George C. Henson died at his home near Hagerstown, Md., recently. Mr. Henson was seventy-one years old, and had been engaged in the manufacture of brick for many years.

James Barnes has purchased the brickyard of U. L. Robinson at Uniontown, Pa. John N. Brownfield, who has been general manager for some time, will be retained in that capacity.

The brickyards of the Pullman Palace Car Co. at Pullman, Ill., have been sold to the Gray-Tuthill Co., which has operated them for the past two years. The price paid was $123,204.

A number of repairs and improvements are being made at the plant of the Sharon (Pa.) Tile Works, preparatory to resuming operations. The plant has been idle for more than a year.

The Campville Brick and Land Co. has been organized by B. T. Camp, R. J. Camp and J. S. Camp for the manufacture of brick and other clay products at Campville, Fla. The capital stock is $60,000.

The Malvern Brick and Tile Works, Perla, Ark., write that they want to purchase a dry pan for the purpose of grinding grog. They will take a second-hand pan if it is in good order and can be had cheap.

Mr. Golden, of Haverstraw, N. Y., has purchased the Littlefield brickyard at Kingston, N. Y., and will immediately begin operations. There is a good demand for brick in that section, where fair prices prevail.

The Independence (Kan.) Vitrified Brick Co. has recently been awarded a contract calling for 9,000,000 brick for a large packing house at Kansas City. They are now very busy, running both night and day.

The Atlantic Clay Manufacturing Company has been organized at Trenton, N. J., with a capital stock of $3,000,000. This company, it is said, will control the fire clay output of Pennsylvania, Ohio, New Jersey and Illinois.

A new firm, to be known as the Spicer Brick Co., will be incorporated to manufacture brick at Mechanicsville, N. Y. They have purchased a tract of thirty acres on which there is an almost inexhaustible supply of excellent clay.

D. P. Guise, the well-known paving brick manufacturer of Williamsport, Pa., has recently received an order from Washington, D. C., for 2,000,000 shale paving brick. He is given twelve months in which to fill his contract.

Afer a shut down of nearly two years the Canton (O.) Stoneware Co. has been reorganized under the name of the Canton Pottery Co., and has commenced work. E. T. Dravo is president of the new concern, where 125 men are employed.

The plant of the Kemper brickyard, located near Williamsburg, Mont., and operated by S. J. Monroe, was damaged to the extent of $500 by fire recently. The loss is fully covered by insurance. The fire is thought to have been of incendiary origin.

Ellory Reece, an employe of the Galesburg (Ill.) Vitrified Brick Co., was seriously injured by a fall of clay at their plant at Wataga. One leg was broken in three places, one arm crushed, collar-bone broken and face wounded, but it is thought he will recover.

The Reese-Hammond Fire Brick Company, of Bolivar, Pa., Pittsburg office Bissell Block, was awarded the contract of vitrified paving blocks for the city of Johnstown on the 20th inst. It will require from 750,000 to 1,000,000 blocks for this contract. This company has also recently completed contracts

CONTINUED ON PAGE 56.

RAYMOND

BRICK MACHINERY

Where it is Used.

In answer to many inquiries as to where our Machinery can be seen in operation, we submit the above diagram.

RAYMOND BRICK MACHINERY is now used and in daily operation the world over. ⁂ Place your finger on the map and you are almost sure to place it upon a Raymond Brick Machine. ⁂ Our great success has not been obtained without merit. ⁂ Buy Raymond's and you get the best.

⁂

C. W. RAYMOND & CO.
DAYTON, OHIO, U. S. A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

for Indiana, Tarentum, Freeport, Greensburg and Duquesne, Pa. They are now supplying two large contracts at Wilkinsburg, and enlarging their works and trebling their output on paving brick to meet their increased demands.

Mr Jas. West, 3012 Euclid Ave., St. Louis, Mo., contemplates erecting a brick plant near that city and will be pleased to receive catalogues of machinery, kilns, etc.

In August last, says an exchange, the foundations were laid near Lysva, Russia, of the first fire brick works erected in the Ural. Ten kilns have been built, with a capacity of 3,000,000 bricks annually. Hitherto all the fire bricks used in the Ural have been obtained from England.

The Zumbrota (Minn.) Brick Co. has been incorporated to manufacture brick. James Cram is president, Charles Grover secretary and F. M. Marsh treasurer. It is the intention of the concern to manufacture building brick at the start, and later on they will add vitrified pavers to their output.

The entire plant of the Canton-Osnaburg Brick and Tile Co. at Osnaburg, O., has been sold to R. W. Allison, of Pittsburg. The business will be carried on under the same name as heretofore. New machinery will be added, and a line of fireproofing will be turned out in addition to the other products.

The plant of the Wellington Brick Co., Springfield, Mass., has been sold to A. N. Mayo and others connected with the Standard Brick Co. The purchase of this plant now places four plants under the management of Mr. Mayo and his associates, and gives them an annual output of 22,000,000 brick.

The employes of the Basic Brick Co. at Johnstown, Pa., were given a surprise in the way of a general advance in wages the first of the month. The employes of the Hawes Brick Works, at the same place, were also given an advance in wages amounting to 15 per cent., the second raise within a month.

The North Anderson Brick Works at Anderson, Ind., were completely destroyed by fire, June 25. Mr. J. M. Clemen, the owner of the plant, places his loss at $20,000, on which there is about $10,000 insurance. He had just recently made improvements amounting to $6,000. The plant will be rebuilt.

The La Prairie Brick Co., La Prairie, P. Q., Can., have taken out articles of incorporation. The new company will purchase and carry on the business of the old La Prairie Pressed Brick Co. The directors of the company are J. N. R. Brunet, T. A. Trenholme, J. W. Tester, Paul Galibert and Fred Westbrooke.

James A. Shields, of Atlanta, Ga., writes that he is in the market for jug ware machinery to turn by hand. He wants a complete equipment for a plant of 400,000 gallons annual output. Manufacturers who can supply Mr. Shields with what he wants can address him direct, care of Mr. J. D. Collins, 432 Norcross block.

The Argillo Tile Works at Carbon Cliff, Ill., were almost wiped out by fire, June 25, entailing a loss of $40,000. The fire originated in a house adjoining the brick works and spread so rapidly that the flames could not be controlled. There was an insurance on the plant for about half the amount of the loss. The works will be rebuilt at once.

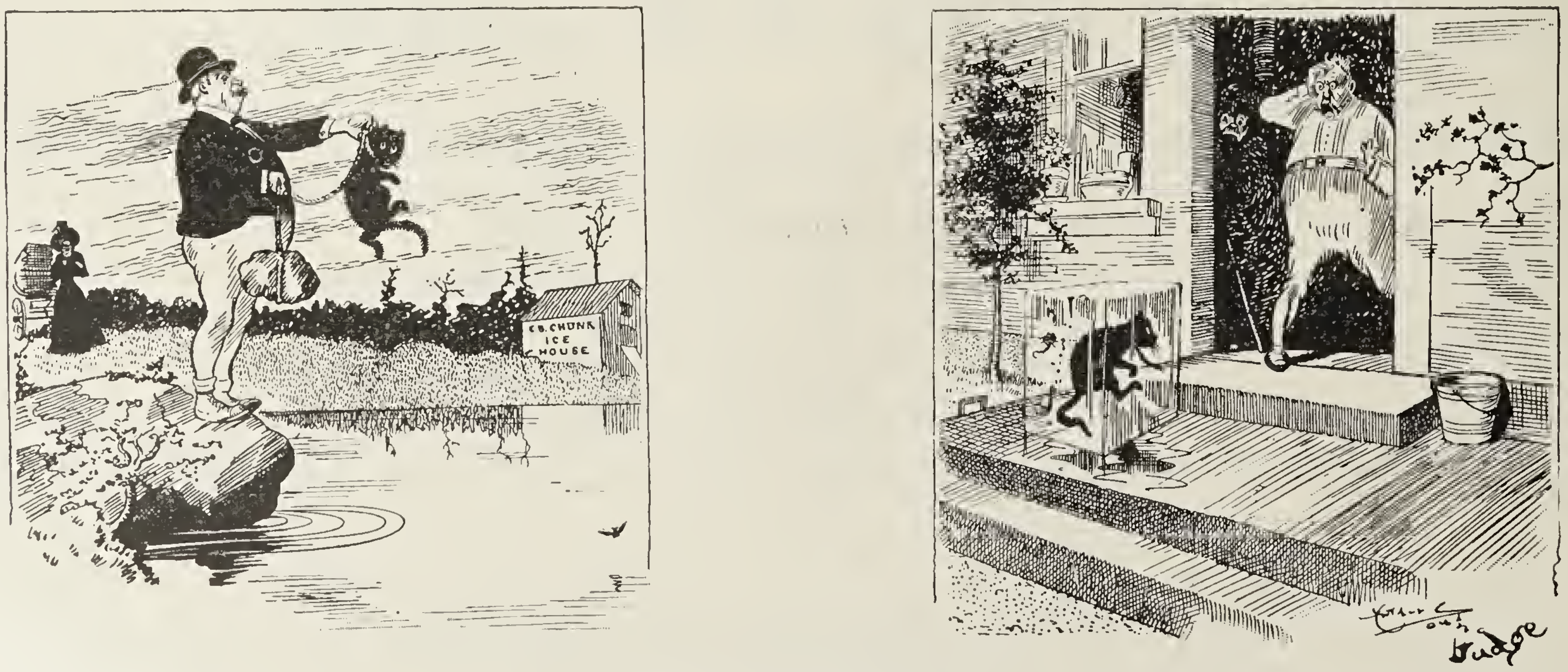
The West Newton Stone and Brick Co. has been formed at West Newton, Pa. The company, of which E. A. Humphreys is manager, will absorb the old brick plant, putting in new machinery, etc., and make, in addition to common red brick, fire brick and special shapes.

The Des Moines (Ia.) brickyards, despite the fact that no public improvements are being made in Iowa this year of any magnitude, are enjoying a splendid business in supplying brick for the building trade. Two of the yards, at least, are selling the usual quantities of brick, while all are finding a great deal more business than had been counted on. A great many shipping orders have been filled in addition to the large number sold for local improvements.

Thomas Maddock, one of the pioneer potters of the country, died at his country home at Liberty Corners, N. J. He was at the head of the pottery firm of Thomas Maddock & Sons, of Trenton, and the Maddock Pottery, South Trenton. He came to this country from England over fifty years ago, and has been identified with the pottery interests ever since. Mr. Maddock was eighty-two years old, and of late years had not been taking an active interest in the pottery affairs.

According to the Philadelphia Record, brick embankments to protect river banks from floods have been successfully used for several years in Italy, and are being introduced into France, Belgium, Egypt and England. A mantle of bricks, ten by ten inches, and four inches thick, are woven together by strong galvanized and annealed iron wires, in such a way as to form a proper bond. The mantle can be woven on a barge as laid down, so as to conform to circumstances, and is cheap, durable and efficient.

The United States Enameled Brick Co., chartered June 19, held a meeting of stockholders in the office of the Reese-Hammond Fire Brick Co., Bolivar, Pa., on June 24, at 10 o'clock a. m., and elected the following board of directors: J. B. Hammond, E. R. Hammond, B. F. Reese, Leonard Roden, all of Bolivar, Pa., and J. B. Sommerville, of Wheeling, W. Va. The following officers were also elected for the ensuing year: J. B. Hammond, president; B. F. Reese, vice president; W. M. Wynn, secretary; E. R. Hammond, treasurer, and Leonard Roden, general manager. It is the intention of the company to take the small experimental plant of the Reese-Hammond Fire Brick Co. and enlarge the same at once, and expect to be in the market within ninety days with a variety of enameled brick in staples and novelties of most beautiful effect. In the experiments thus far made some original and delicate designs have been turned out that surpass anything in this line that has been placed on the market. The secret process that this company owns and controls, by which the brick will be made, will enable them to produce a brick that will not craze. All parties interested, stockholders as well as officers, are men of large experience in the clayworking business, and the industry promises to be a great success from the start.



THE CAT CAME BACK.

"Now, you miserable old roof-prowler! I guess it will be a cold day when you darken my door again."

It was not a cold day. It was on a hot summer morning when, thanks to the iceman, the cat came back.

The "Monarch" BRICK.... MACHINE,

Unquestionably the——

Leading Horizontal "Soft=Mud" Machine.

More in use than other of its class.

◆

The

"Iron Quaker" Brick Machine

Unquestionably the——

Leading Upright "Soft=Mud Machine.

Horse and Steam Power.

More "Quaker" Machines in use than any of its class.

M. BRADFORD. L. J. WILD.

BRADFORD & WILD,

MANUFACTURERS AND SHIPPERS OF

First-Class Brick at Lowest Prices.

Donaldsonville, La., Oct. 21, 1898.

The Wellington Machine Co.,
Wellington, Ohio.

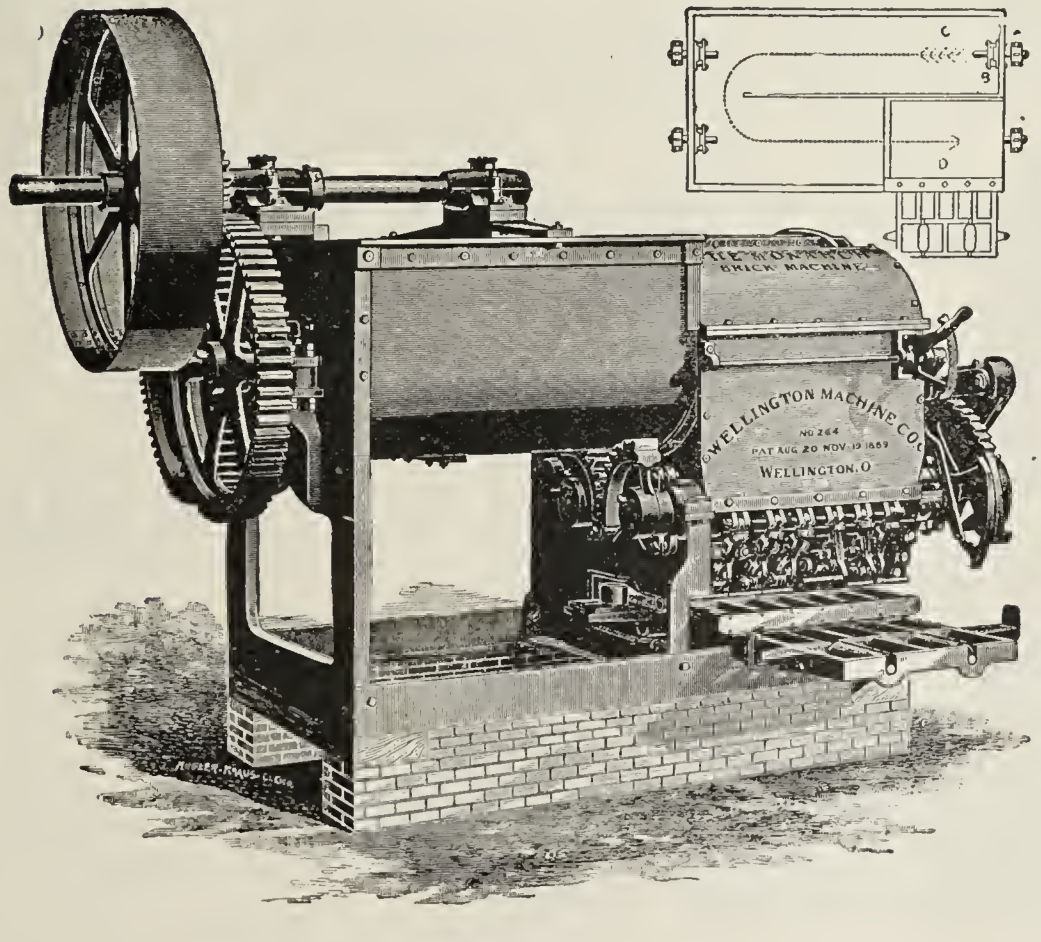
Gentlemen:-

We hereby take pleasure in recommending your "Monarch" Brick Machine which we have had in use since May, and can conscientiously say that it has given us entire satisfaction. It is a "hustler in its work. We have made over a million and one-half brick since we received and got it in operation, and can positively say that it is all that it was represented to us.

We have been in business a number of years, but never knew what it was to do business with comfort. Our business has increased wonderfully. Why? Simply because we make more bricks. More bricks means more money. Had we taken such a machine ten years back we would want to get out of business and take the world easy. Therefore, you are at liberty to refer any one to us at any time, and we will cheerfully recommend the machine to any who contemplate buying one.

Yours very truly,

Bradford & Wild
Per L. J. Wild



We have the Best and Lowest Priced

Mold=Sander.

◆

No one else makes . . . .

BALL-BEARING TRUCKS and BARROWS.

The Greatest Improvement in small articles ever put upon a brickyard.

◆

ALL OTHER AUXILIARY TOOLS, MACHINES AND SUPPLIES.

The Wellington Machine Co.,

Send for Circular. Mention the Clay-Worker *WELLINGTON, OHIO.*

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED — Pressers and finishers at the works of the Perth Amboy Terra Cotta Co., Perth Amboy, N. J. Apply to foreman, W. W. Henry. 7 1 d

WANTED — A position as superintendent of brick works; 30 years' experience; can remodel works if desired; first-class references. Address MISS, Care Clay-Worker. 6 2 c

FOR SALE — One "A Special" Freese brick machine and pug mill, good as new; also one "Martin" soft-mud machine.

KITTANNING CLAY MFG. CO.,
7 1 c Kittanning, Pa.

WANTED — A lot of one-inch pipe, suitable for use in a steam-heated brick dryer. Must be in good condition and cheap. Address STEAM, care Clay-Worker. 7 1 d

WANTED — Second-hand pug mill in first-class condition; medium large capacity. Address THE HILLSIDE FIRE BRICK & CLAY CO., 1203 Security Building, Chicago. 7 1 d

WANTED — A good setter for dry press brick plant; also good man for general repair work. Address

THE GARDEN CITY CO.,
7 1 d Farmingdale, Long Island.

WANTED — Position as superintendent or burner of either dry pressed or plastic brick works; thoroughly practical in every department of manufacturing same; No. 1 references given. Address ST. LOUIS, Care Clay-Worker. 6 tf d

WANTED — SITUATION—Fire brick salesman, thoroughly practical and capable, well known in the trade, open for engagement. Would like to represent some good Pennsylvania company. Address H., Clay-Worker Office. 7 1 d

BURNERS WANTED — Two good, reliable brick burners, who know how to burn paving brick and can give satisfactory references as to ability, etc., will be given steady employment at $2.50 a day. Address HORACE, care Clay-Worker. 7 1 d

WANTED — A good, reliable man to take the superintendency of a new stiff-clay brick plant using Chambers machine. Must be sober and industrious. A good, permanent situation for the right man. Address ASHBY, care Clay-Worker. 7 1 d

FOR SALE — Cheap, one 20-horse-power Erie center crank engine, one 25-horse-power tubular boiler, including front and grate bars; one E. M. Freese brick and tile machine, cut-off and carriers, belts complete. Plant only used two seasons; in good repair. Will sell for one-third cost if taken now. Address W. E. H., care Clay-Worker. 7 1 cm

WANTED — A position with some brick machinery company to go out and erect brick plants; any part of the world. First-class references as to ability in erecting machinery, making and burning of bricks. At present am superintendent of plant—capacity, 80,000 per day—or would take charge of modern brick plant. Address PHILLIPINO, care Clay-Worker. 7 1 1p

ENOUGH MATERIAL daily for 30,000 pink, buff pressed front brick, mined as an incidental product in getting coal. Want expert manufacturer with capital to build brick plant at the mine. Clay in mine cars delivered to crushers and coal dumped around kiln doors. Five acres for plant. Plenty of water. Favorable freights. Material for 1500 million brick besides large variety miners in abundance. Give full references in first letter. Address, ALBERT PIKES, care Clay-Worker. 7 3 c

FOR SALE — One four-foot stationary wet pan, bottom driven, with steel dust cover; almost new; Phillips & McLaren make; cheap.

KENDALL & FLICK,
618 Penn. ave. N. W., Washington, D. C.
6 1 d

WANTED TO BUY.

Six thousand feet second-hand track, three or four side dump cars, one winding drum, one 45 to 50-horse-power engine and one 60-horse-power boiler, with pumps, etc., and one pug mill. Address A. C. OCHS, Springfield, Minn. 7 1 d

FOR SALE — Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address

OLD BRICKMAKER,
6 tf d Care Clay-Worker.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

....WHAT THE CLAY WORKER NEEDS....

Is a belt that will accomplish the heavy work required of it,

holding the bucket firmly without slipping.--This the

Leviathan Belting

does better than any other, and, what is of more interest to Clay Workers, the LEVIATHAN will

WORK FOR YEARS IN A DUST CLOUD,

or exposed to weather conditions of any kind.

THESE ARE THE REASONS WHY LEVIATHAN BELTING IS IN SUCH GENERAL USE AMONG CLAY WORKERS.

MAIN BELTING COMPANY,

1221-41 Carpenter St., Philadelphia, Pa.

1221-41 Market St., CHICAGO. Send for Price List and Samples. **120 Pearl St., BOSTON.**

The Bushong Square Down Draft Kiln

Is so constructed that the **heat** is **equally distributed** to **all parts** of the **Kiln.**

For **uniform** and **all hard burning** this kiln leads them all. Built any size desired. This kiln is now being used by some of the largest brick plants in the country.

For further particulars, address

M. M. BUSHONG, Phoenixville, Pa.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

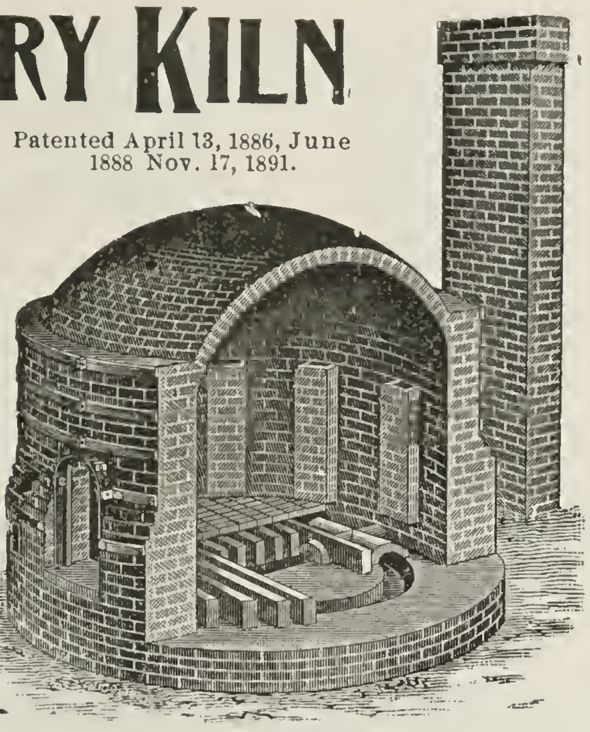
I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,
Chenoa, Ill.

CAPT. G. H. ETTLA, Agt. Marietta, Pa.



The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

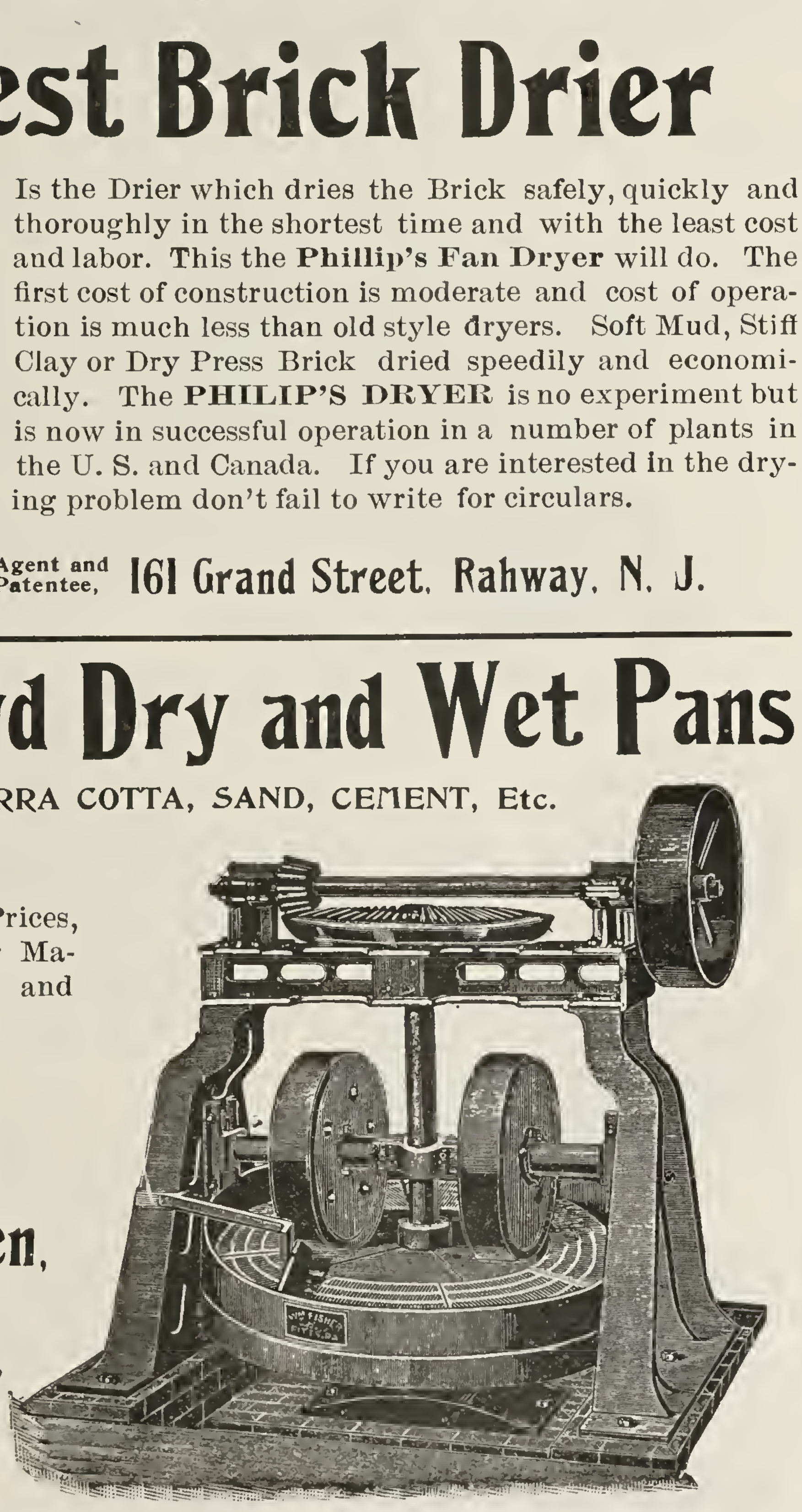
S. G. PHILLIPS, Agent and Patentee, **161 Grand Street, Rahway, N. J.**

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works,
24th and Smallman Sts.,
PITTSBURG, PA.



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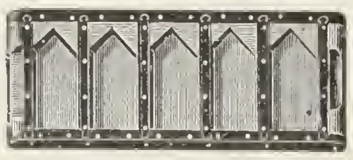

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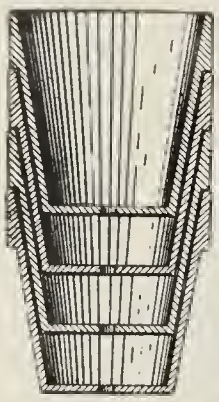

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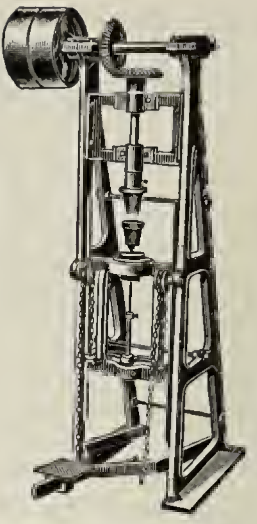

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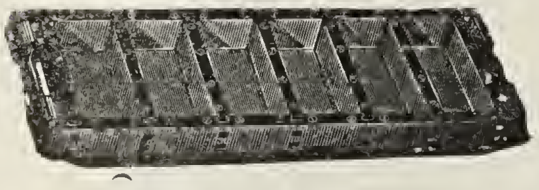

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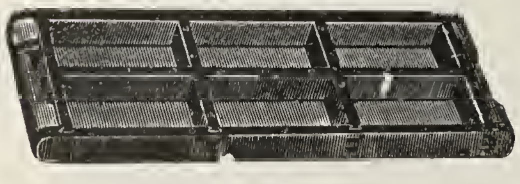

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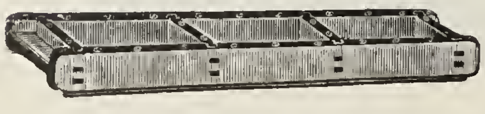

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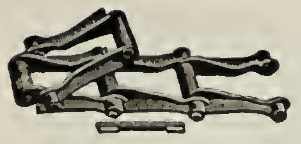
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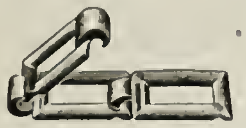
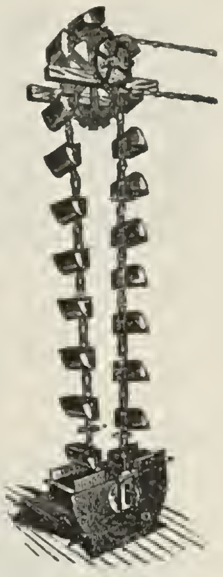

Ewart Detachable Chain.



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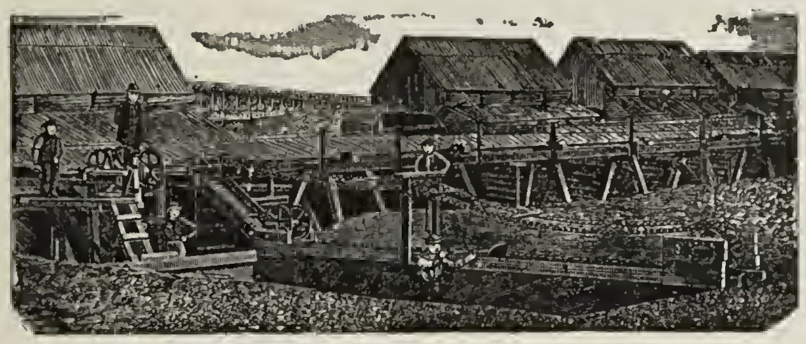
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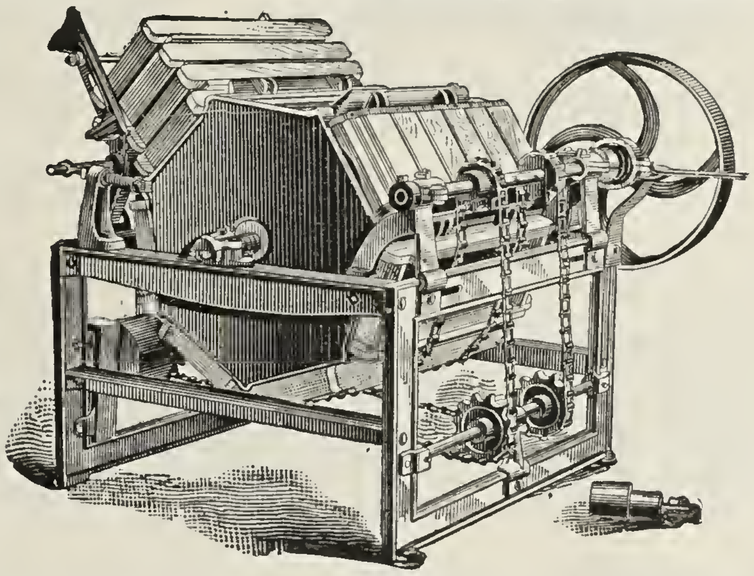

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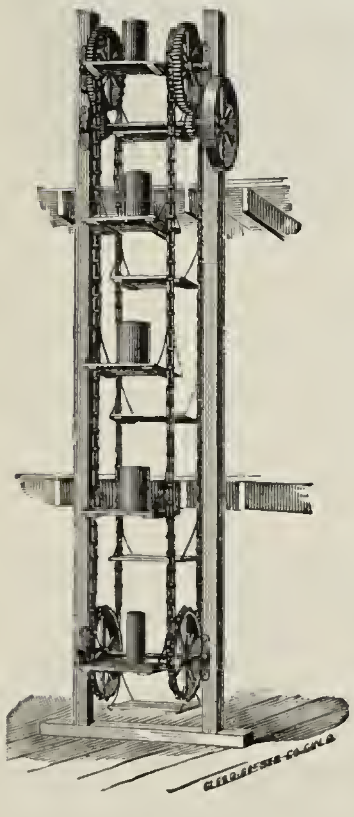
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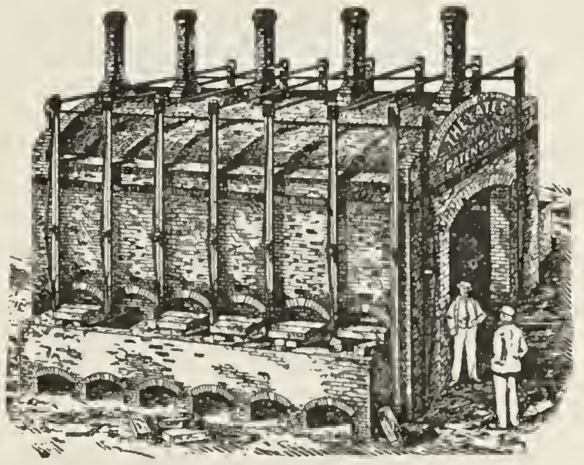

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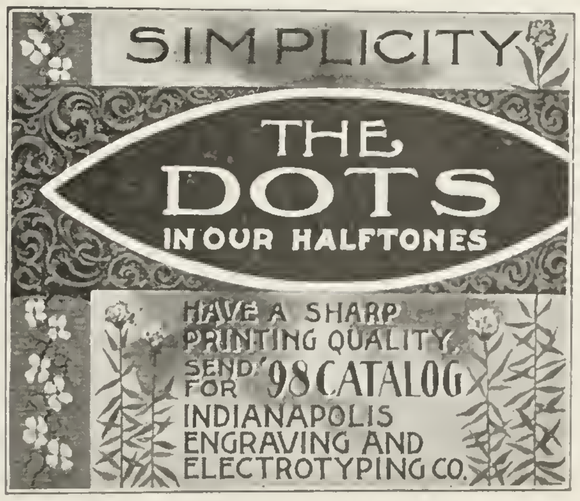

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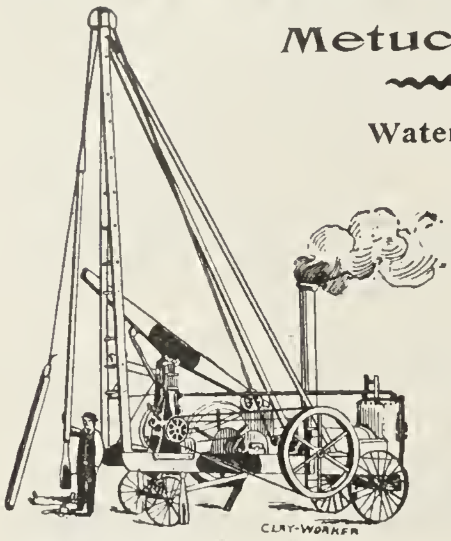

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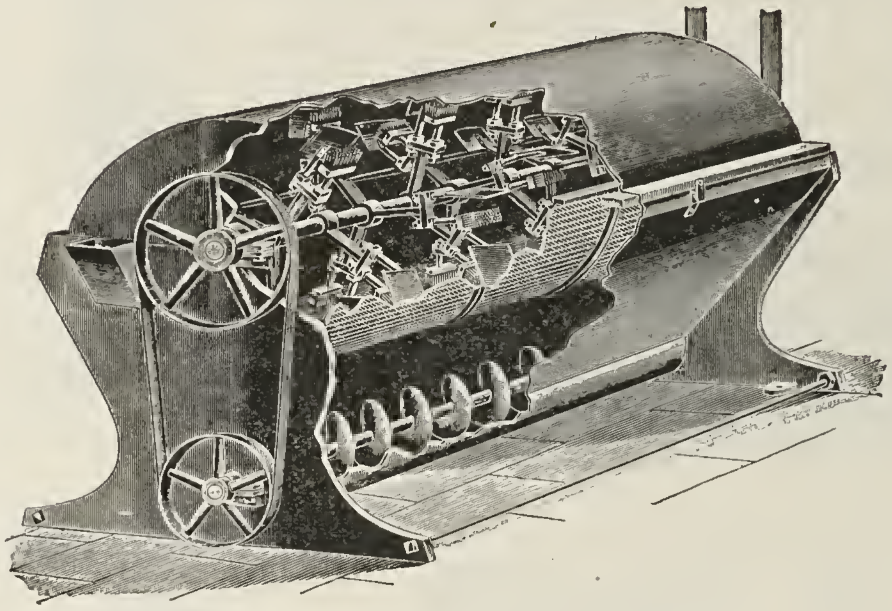

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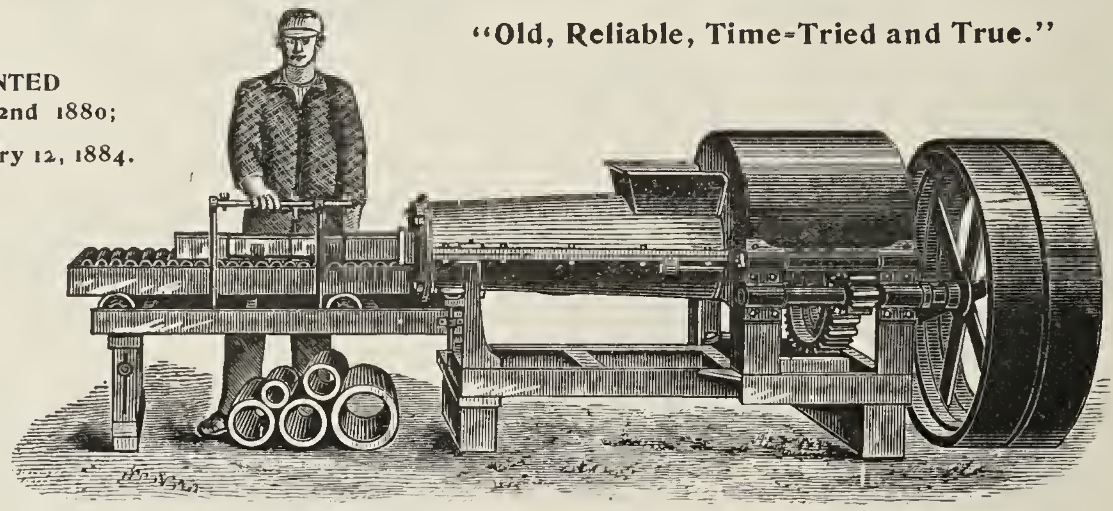

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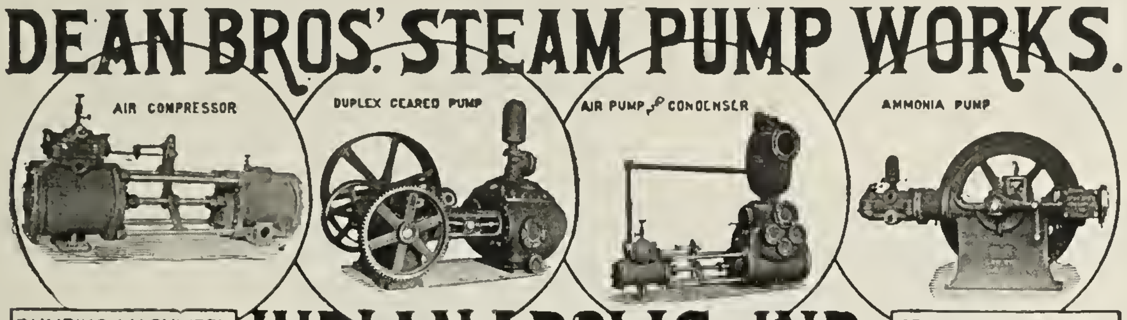

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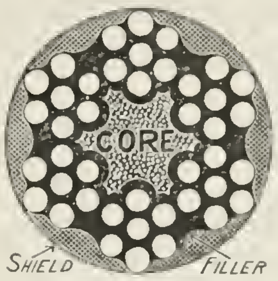

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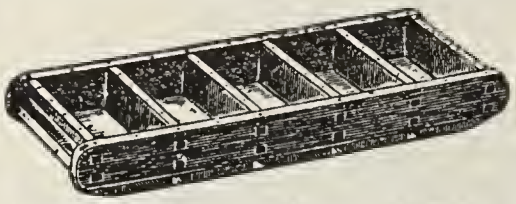
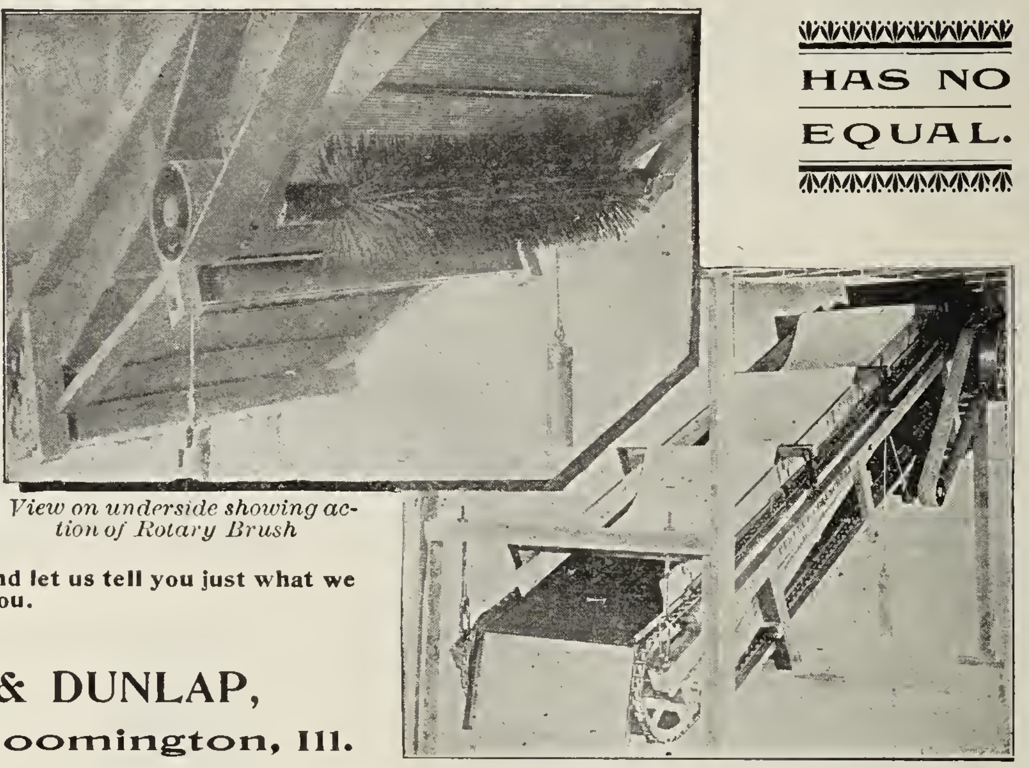


A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

The PERFECT CLAY SCREEN.

This Screen positively Saves one man.
Increases grinding capacity.
Gives a finer grade of clay
Does the work as well in cold weather as in warm.
Screens cold moist clay as well as dry.
It will more than save its cost in one Winter.



View on underside showing action of Rotary Brush

HAS NO EQUAL.

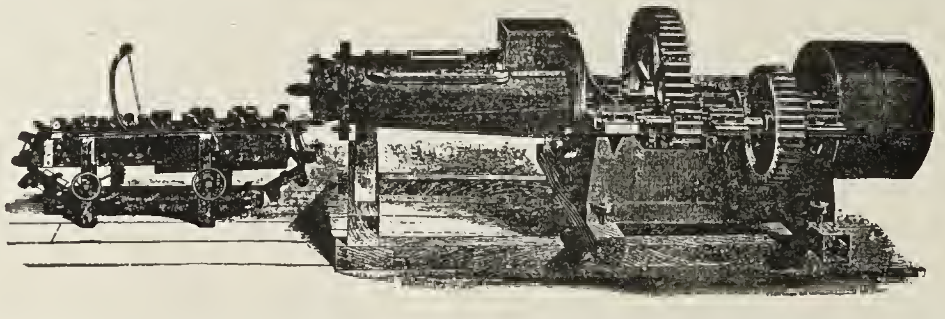
Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers ... of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

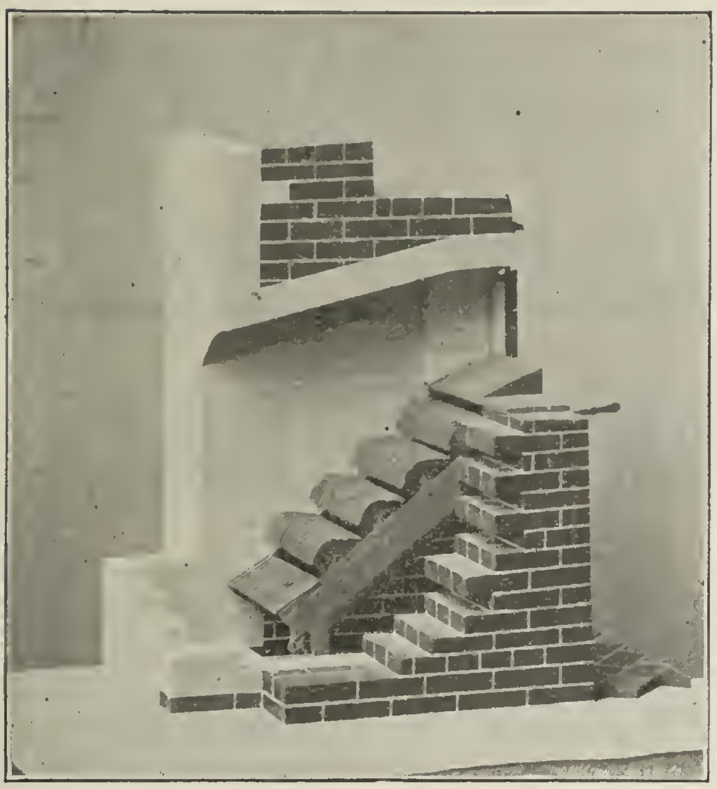
Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

The ALSIP IMPROVED.... KILNS

Have more points of superiority than any others on the market. Will be pleased to tell you all about its merits.



"PATENT APPLIED FOR."

The ALSIP KILN Furnace Grate,

Can be **attached** to **any style** of **kiln furnace.**

It is a **coal coker** and a **gas generator.**

Is **self cleaning** and has a **gradual feed.**

Is simple and **durable.**

Nothing but **coal slack** needed for **fuel.**

Guaranteed to save **labor** and **fuel.**

Investigate and be convinced.

S. H. ALSIP, *Belleville, Ill.*

WEST and SOUTH

run the lines of the Illinois Central Railroad and the Yazoo & Mississippi Valley Railroad, reaching into the eleven States of

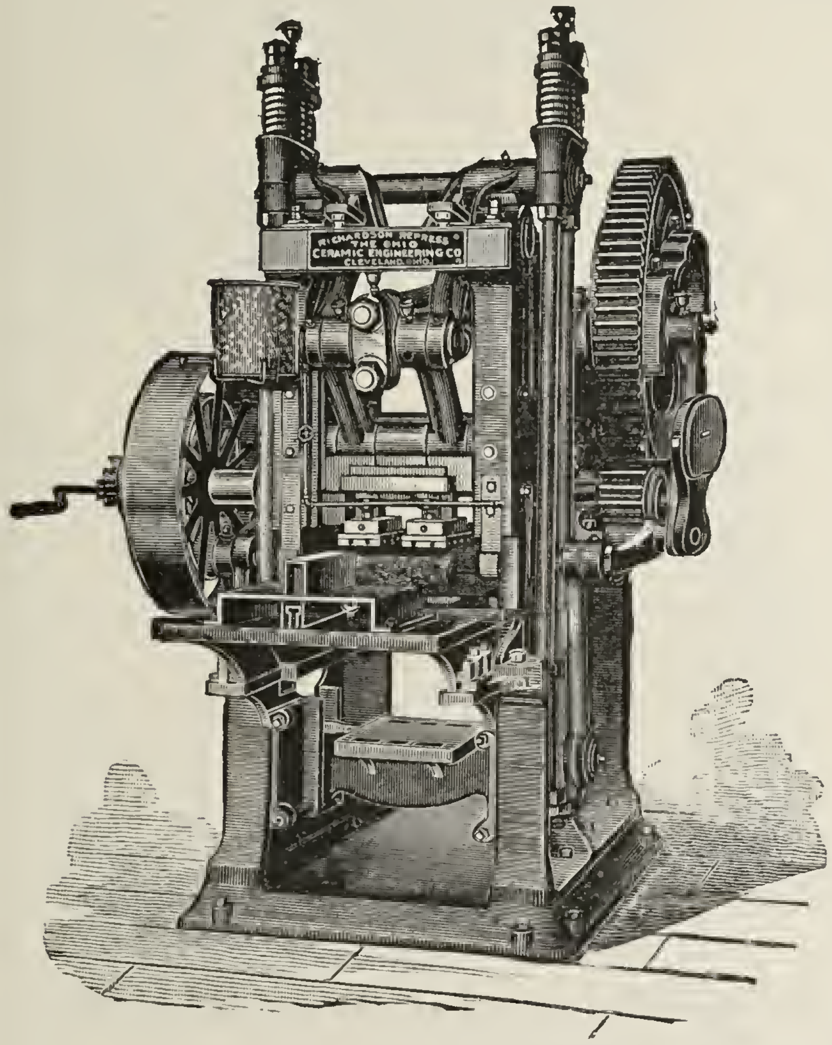
South Dakota	Kentucky
Minnesota	Tennessee
Iowa	Arkansas
Wisconsin	Mississippi

Illinois, Indiana, Louisiana,

Presenting an unequaled territory for diversified industries, and possessing

Fine Sites for New Mills,
Best of Freight Facilities--Coal Fields--Close Proximity to Distributing Centers.
Intelligent Help of all Kinds.
Many Kinds of Raw Material.

To sound industries, substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered Textile Industries in the South by a number of good places. GEORGE C. POWER, Industrial Commissioner I. C. R. R. Co., Chicago.



THE RICHARDSON REPRESS.

YOU

Are a practical brick maker. We are practical makers of practical brick making machinery. ∴ ∴ ∴ ∴ Send for Catalogue.

The OHIO CERAMIC ENGINEERING COMPANY, Cleveland, Ohio.

Thurber Brick Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

Correspondence solicited.

Office and Works: Clinton, Ind.

INDIANA PAVING BLOCK,

The Standard Shale Block for Street Paving.

Manufactured at Brazil, Ind., by the

Indiana Bermudez Asphalt Co.,

Main Office, 25 and 26 Baldwin Block,
INDIANAPOLIS, IND.

Prices and samples furnished on application to above address.

IOWA BRICK COMPANY,

MANUFACTURERS OF

Paving Brick

...AND...

Sidewalk Brick.

Equal to any brick made, as the many tests have proved.

Samples sent on application. Write for prices.

IOWA BRICK CO.,
Des Moines, Iowa.

J. L. HIGLEY & CO.,
CANTON, OHIO.

Four of the largest and best paving brick plants in the world.

Canton Paving Block,

Head the list for uniformity, finish and wearing qualities.

Samples sent free on application.

Write for prices.

When Mr. Culver of the

Wabash Clay Company,

of VEEDERSBURG,
INDIANA,

Can find time to prepare his "ad." it will occupy this space. Meantime, if you would know about his Company's material and its splendid merits, write for a list of the Cities and Towns that have used it.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO.,
Publishers,
INDIANAPOLIS, IND., U. S. A.

The PURINGTON PAVING BRICK CO.,

of GALESBURG,
ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

T. B. McAVOY, President.
FRANK B. McAVOY, Sec. and Treas.

McAvoy Vitrified Brick Co.,

of PHILADELPHIA,
PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 Arch St., Philadelphia.
WORKS:—Perkiomen Junction, Penn.

9 Outfits in One Month. Why?

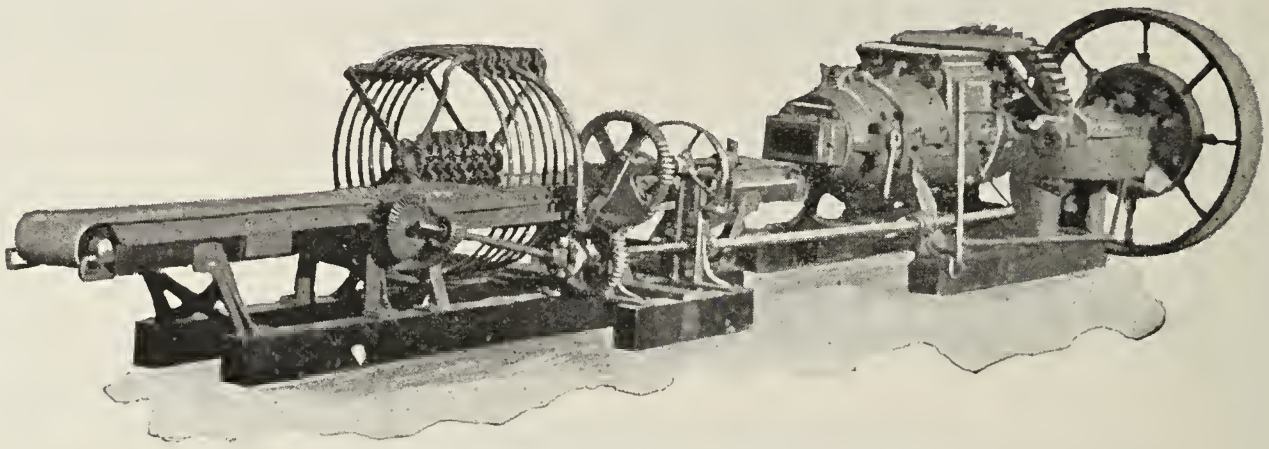
They are { BUILT RIGHT, SOLD RIGHT.

Pendleton, S. C., April 19, '99.

GENTS:
The Automatic Side Cut Table is the finest thing of the kind I have ever seen.

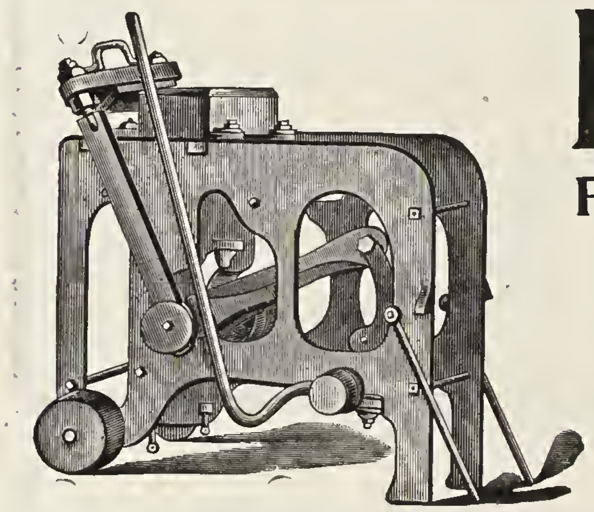
J. C. STRIBLING.

END OR SIDE CUT BY CHANGING REEL FRAME.



X-tra and Automatic Side Cutter.

J. C. STEELE & SONS, Manufacturers of The "NEW SOUTH" BRICK MACHINERY, **Statesville, N. C.**



RED BRICK PRESS.

GEORGE CARNELL,

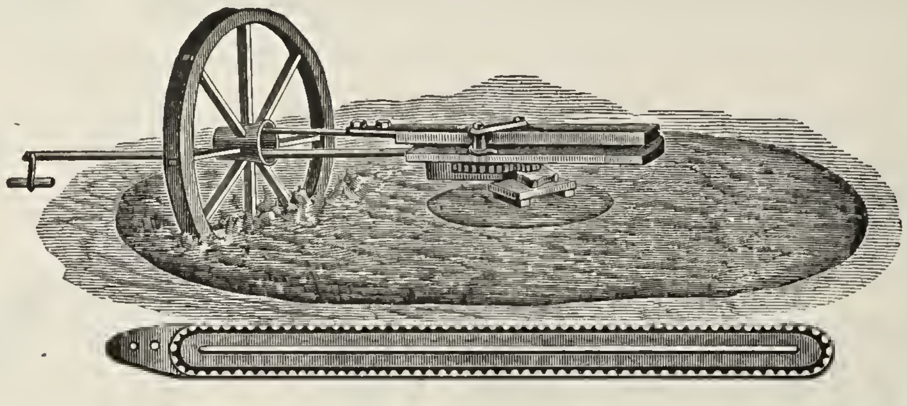
Nos. 1,819, 1,821 and 1,823 Germantown Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

☞Send for Circular and Price-List.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.
....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

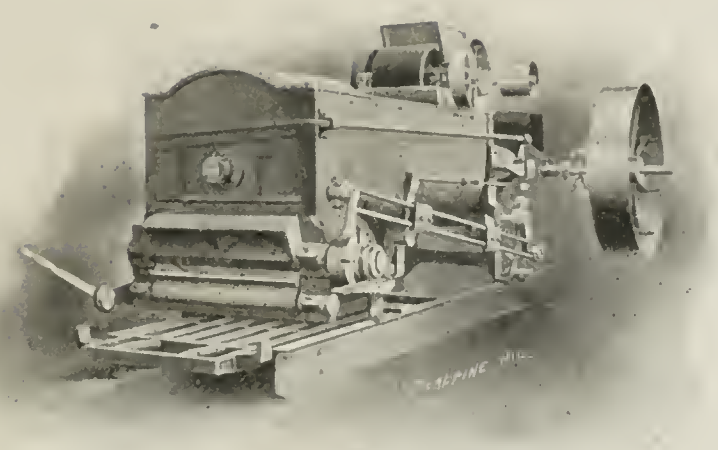
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

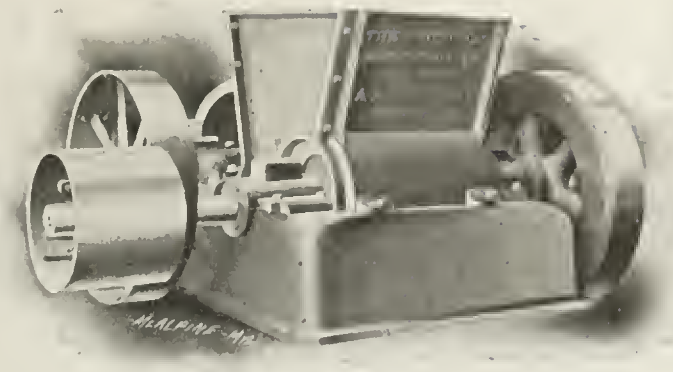
[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.



Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



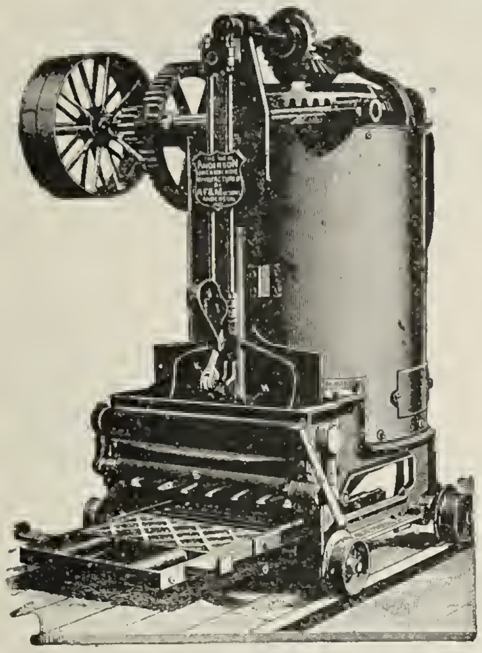
Best Disintegrator on the Market.

MANUFACTURERS OF . . . .

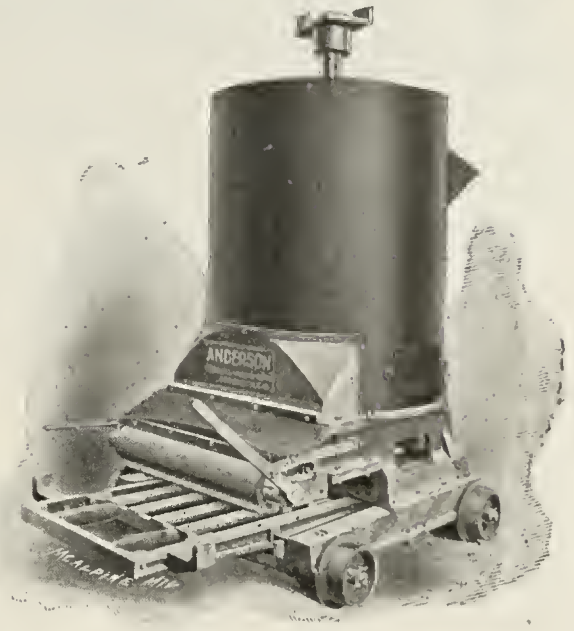
New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,
And all Brickyard Supplies.



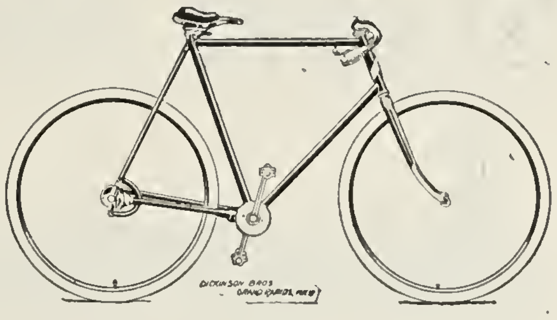
Steel and Iron Upright Stock Brick Machine.



1899 Horse Power Machine.

The Anderson Foundry and Machine Works,
Anderson, Ind.

For More Than Ten Years

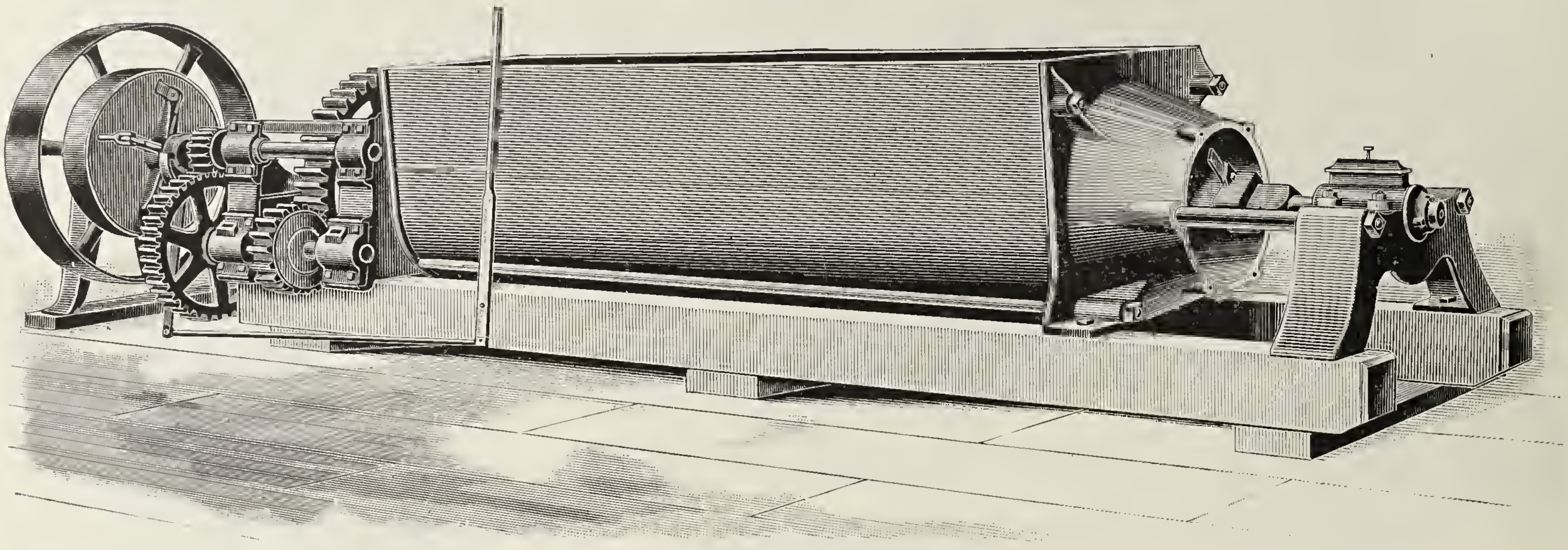


We've had the reputation of making the finest business bicycles in the world. In that time we've sold thousands of Clipper Bicycles to business men, farmers and mechanics. We made the first reliable bicycle that was retailed at $50.00. That was years ago. We still make the best fifty-dollar bicycle in the world. We also make a Chainless that's worth more ($75.00's the price); and for $35 00 we've got something that surprises those who buy it.

Get our prices to you for introducing our wheels into your vicinity. We have a few bargains. ☞Write for bargain list to

GRAND RAPIDS CYCLE CO., "Clipper People," MICH.

A GOOD THING.



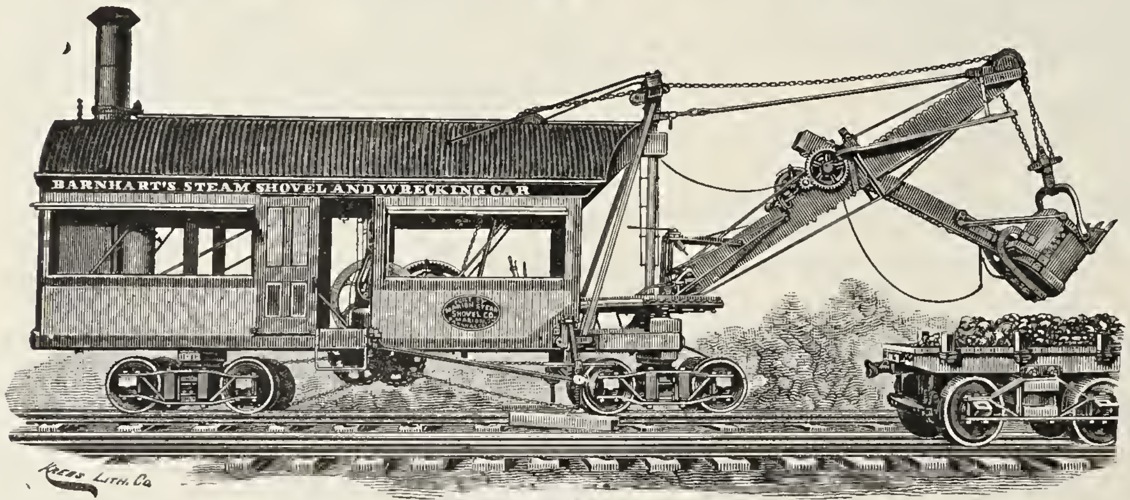
Leader Pug Mill, Size No. 9.

Send for circulars of our **Leader Machinery.**

Brick Machines, Pug Mills, Crushers, Disintegrators, Automatic Cutters, Etc., Etc.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.


BARNHART'S STEAM SHOVEL AND WRECKING CAR
Reeves Lith. Co.

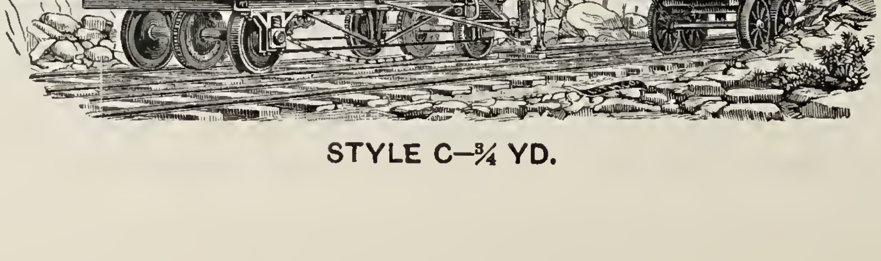
STYLE A—1½ YD.

Our large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,
603 West Center Street, - **MARION, OHIO.**


BARNHART'S STEAM SHOVEL CO.

STYLE C—¾ YD.

If You Want the BEST

Dryer Cars

At a **very reasonable price** give us an opportunity to show you our new designs. We have used them in the **Brick Business** and have overcome the **weak points.**

CLEVELAND CAR CO.,
150 Scranton Ave., CLEVELAND, OHIO.

Mention the Clay-Worker

Have You Ever Considered This?

That a Very Small Quantity of

Dixon's Ticonderoga FLAKE GRAPHITE.

Say 5 to 10 per cent. added to the grease or oil that you are now using, will make you oil or grease do three to six times as much work and do it much better.

This has been fully demonstrated but if you want to prove it for yourself we will send you samples free of charge and a pamphlet giving full particulars.

JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

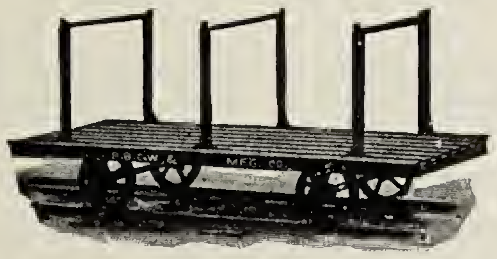
The Atlas Bolt & Screw Co.,

Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

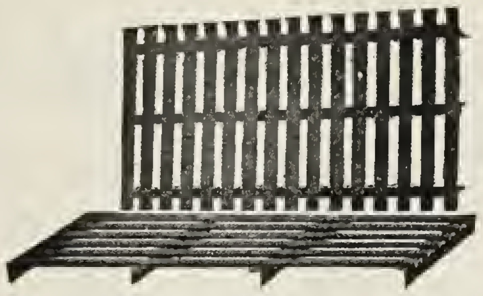
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

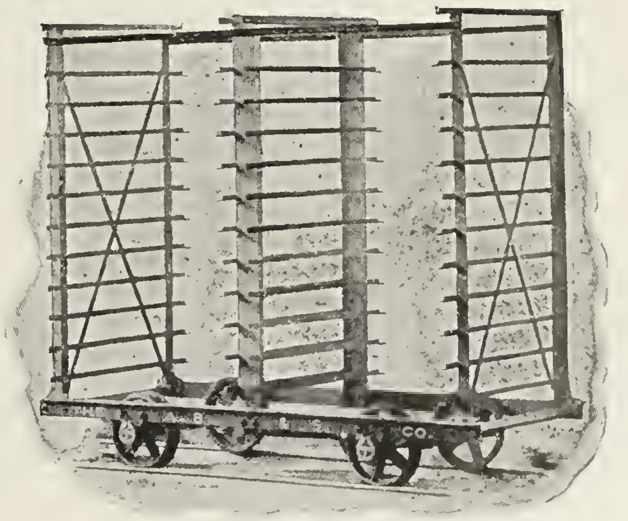
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats $2\frac{1}{2}$ inches wide, spaced $2\frac{1}{8}$ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats $2\frac{1}{2}$ inches wide, spaced $2\frac{1}{8}$ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, $4\frac{1}{2}$ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

Horseheads Brick Co., N. Y., August 13, 1898.

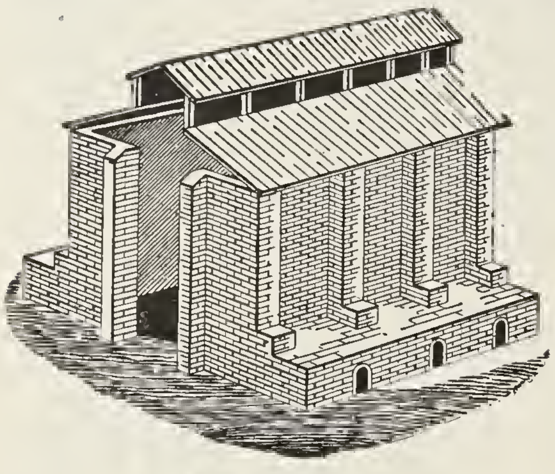
Mr. H. HAIGH, Catskill, N. Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success. In fact we have been able to do much more than you had guaranteed the kiln would do. We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours, R. G. EISENHART, Treas. and Gen. Man.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

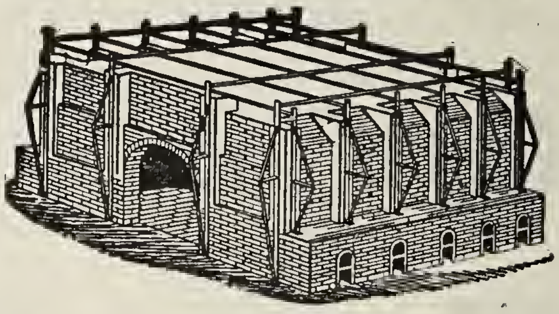


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, **2,422 Chestnut St.,** ***Kansas City, Mo.***

MORRISON'S LATEST IMPROVED KILN.

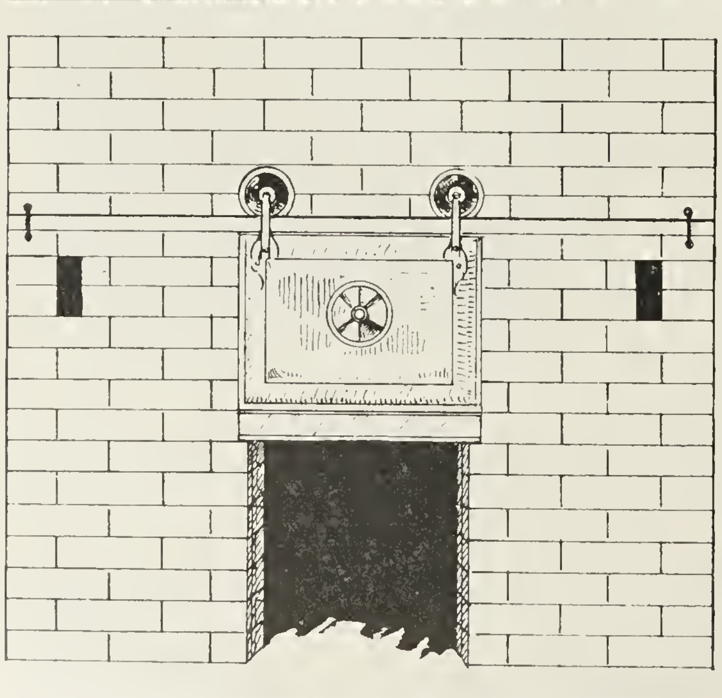
FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,

P. O. Box 335. ***ROME, GA., U. S. A.***



The Mitchell One Door Coking Furnace
IS NO EXPERIMENT.

The Mitchell Slack Coal and Coking Furnace

Can be attached to any style of Kiln.

Guaranteed to be the cheapest and most economical furnace on the market to Construct and operate.

It positively excludes all cold air from coming in contact with your ware.

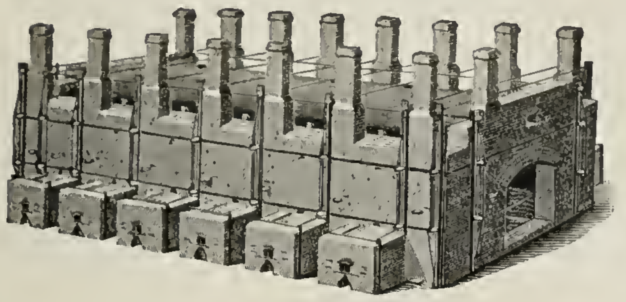
It requires nothing but the cheapest grade of slack from start to finish of burn.

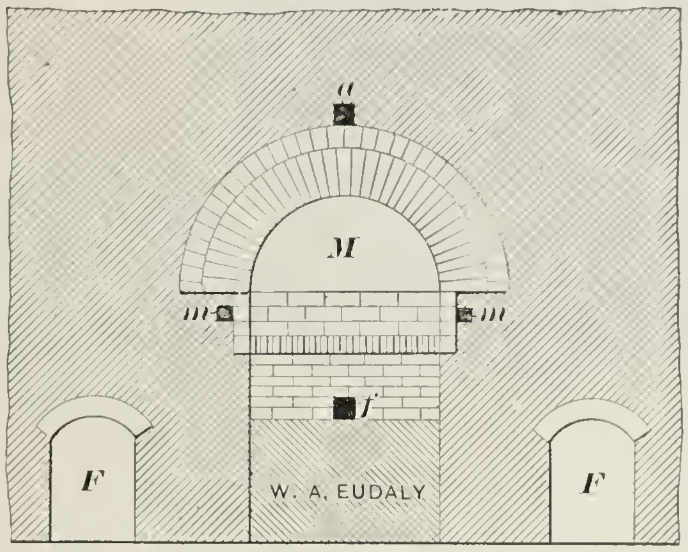
For further particulars testimonials address

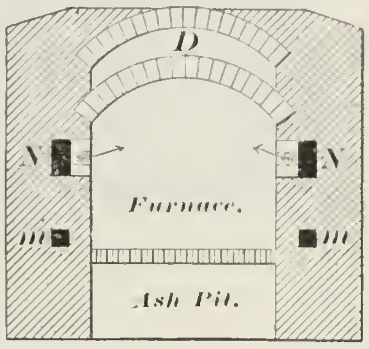
W. C. MITCHELL, Oelwein, Iowa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.







These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning ot culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

Portable Continuous Kiln and Drying Floors.

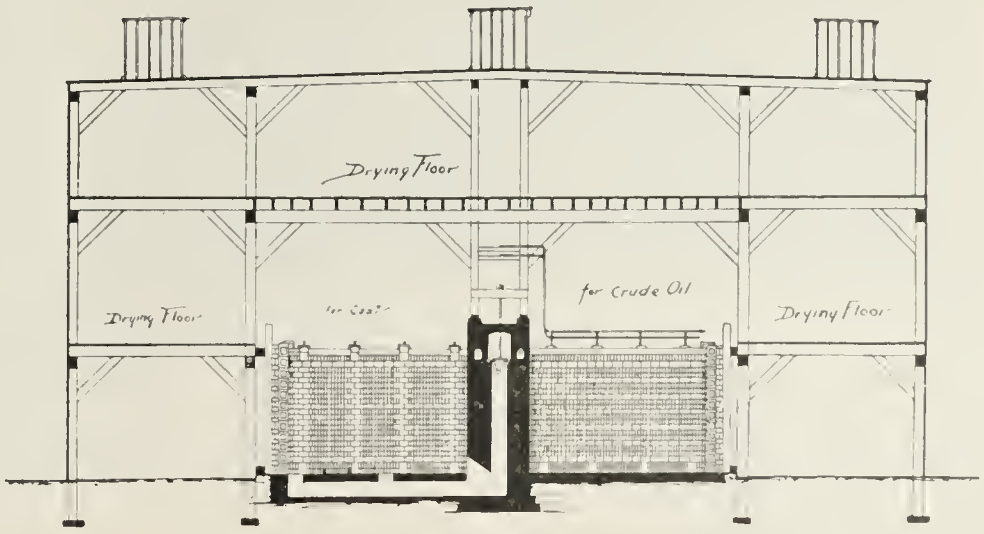
(Lehmann's Patent.)

By this system the cost of drying and burning is much less than by old methods and the green ware is handled by mechanical appliances that insure safe, rapid and cheap work. This system now in successful operation at Chicago and other points. Adapted to the use of any fuel, coal, oil or gas. If you want to reduce your fuel bills and improve quality of your ware write for full particulars.

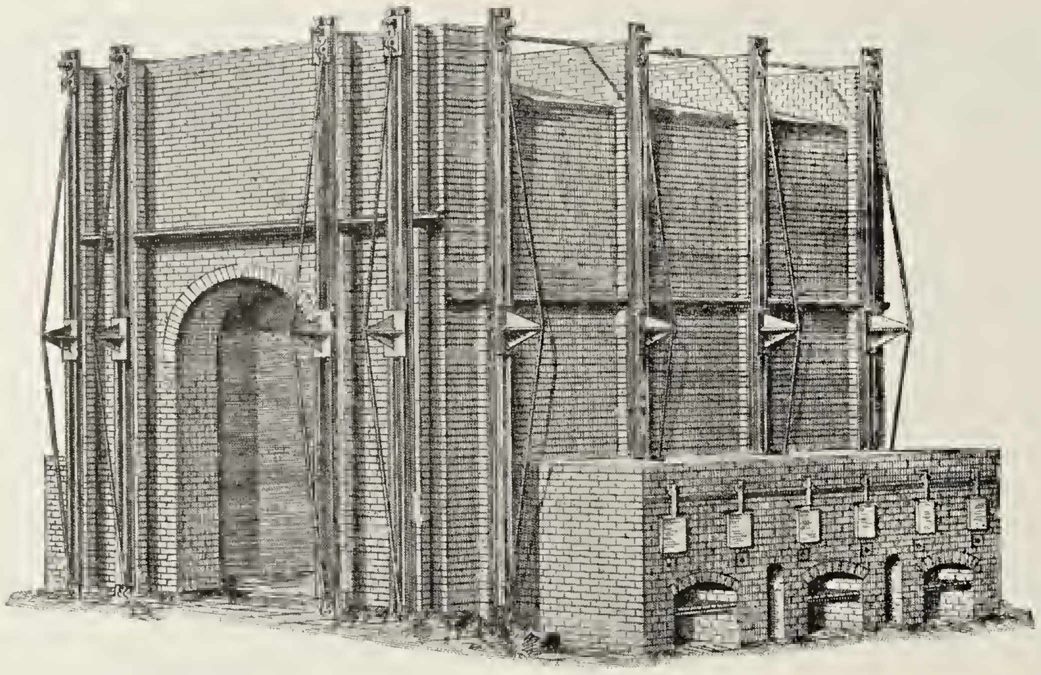
F. LEHMANN & CO.,

Foot of West Wellington Street,
CHICAGO, ILL.

Kiln Builders, Consulting Clayworker Engineers, Plans and estimates furnished for Brick, Lime and Cement Works. Practical tests made.



The Lehmann Slumming Apparatus Is the most economical method of washing clays yet devised. It is simple and effective. By it all objectionable materials may be easily removed from common clay, kaolin, chalk, cement, mineral paints, etc. Full particulars for the asking.

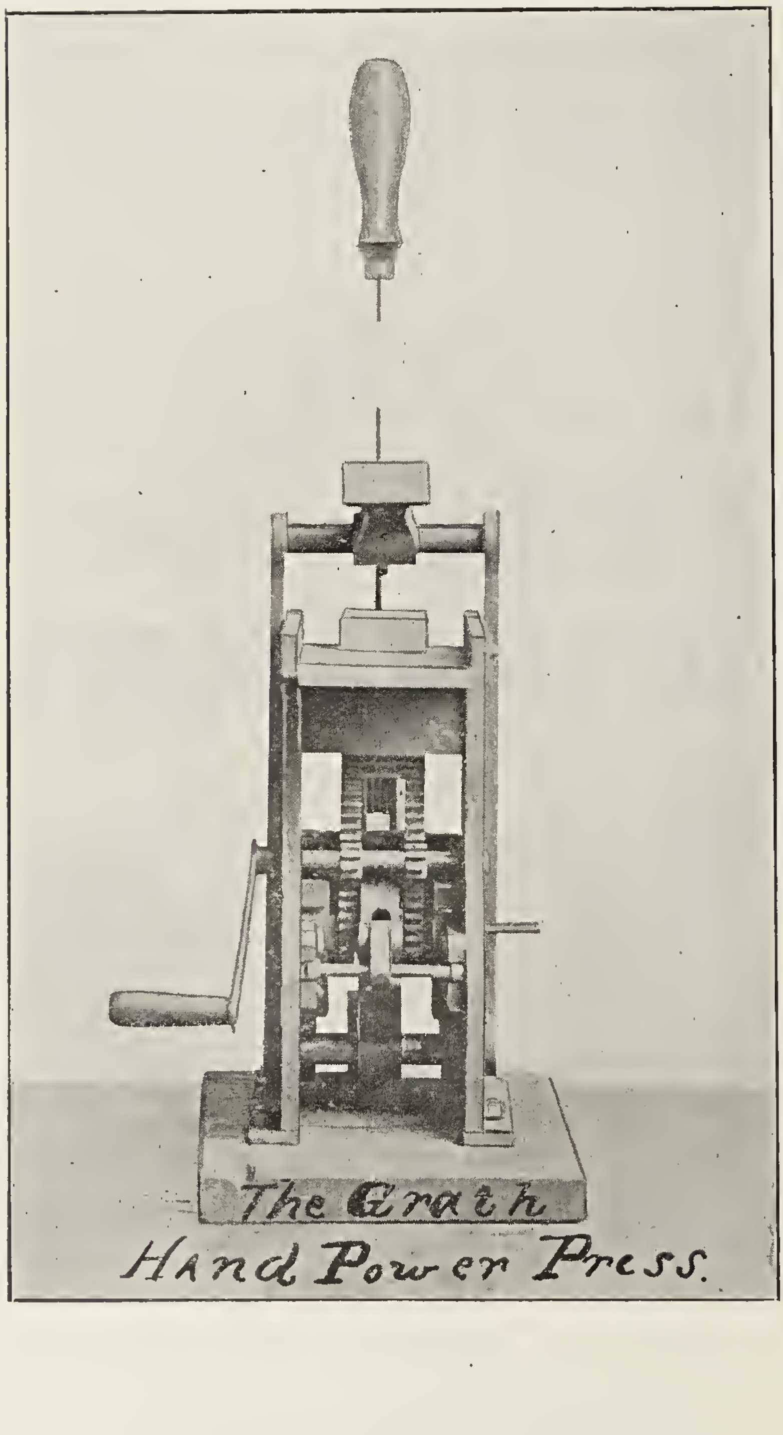


PATENTED.

The GRATH DOWN-DRAFT KILN,

With Coking Furnace attached will burn the largest amount of Face, Vitrified or Fire Brick. We guarantee from 90 to 98 per cent. first quality brick. No soft or salmon brick in kiln. Built any size wanted.

◆



The Grath Slack Coal Gas and Coking Furnace,

Can be attached to either **Down or Up-draft Kilns.** Patent covers coking table in **center** of Furnace as well as on **sides.**

◆

The Grath Dry Clay Hand-Power Brick and Tile Press.

Simplest, most Powerful and Durable Hand Press on the market. Will give as much pressure as a steam power press. For making plain press and ornamental brick from dry or semi-dry clay.

◆

The Grath Perfect Brick Grinding Machine

For grinding arch and radius brick, will grind a vitrified brick as well as an ordinary press brick, **without the aid of sand,** and does not discolor the brick. Best and cheapest and simplest Brick Grinder on the market.

◆

Simplicity and Durability,
IS OUR MOTTO.

◆

FOR FURTHER PARTICULARS, ADDRESS

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St. Louis, Mo.

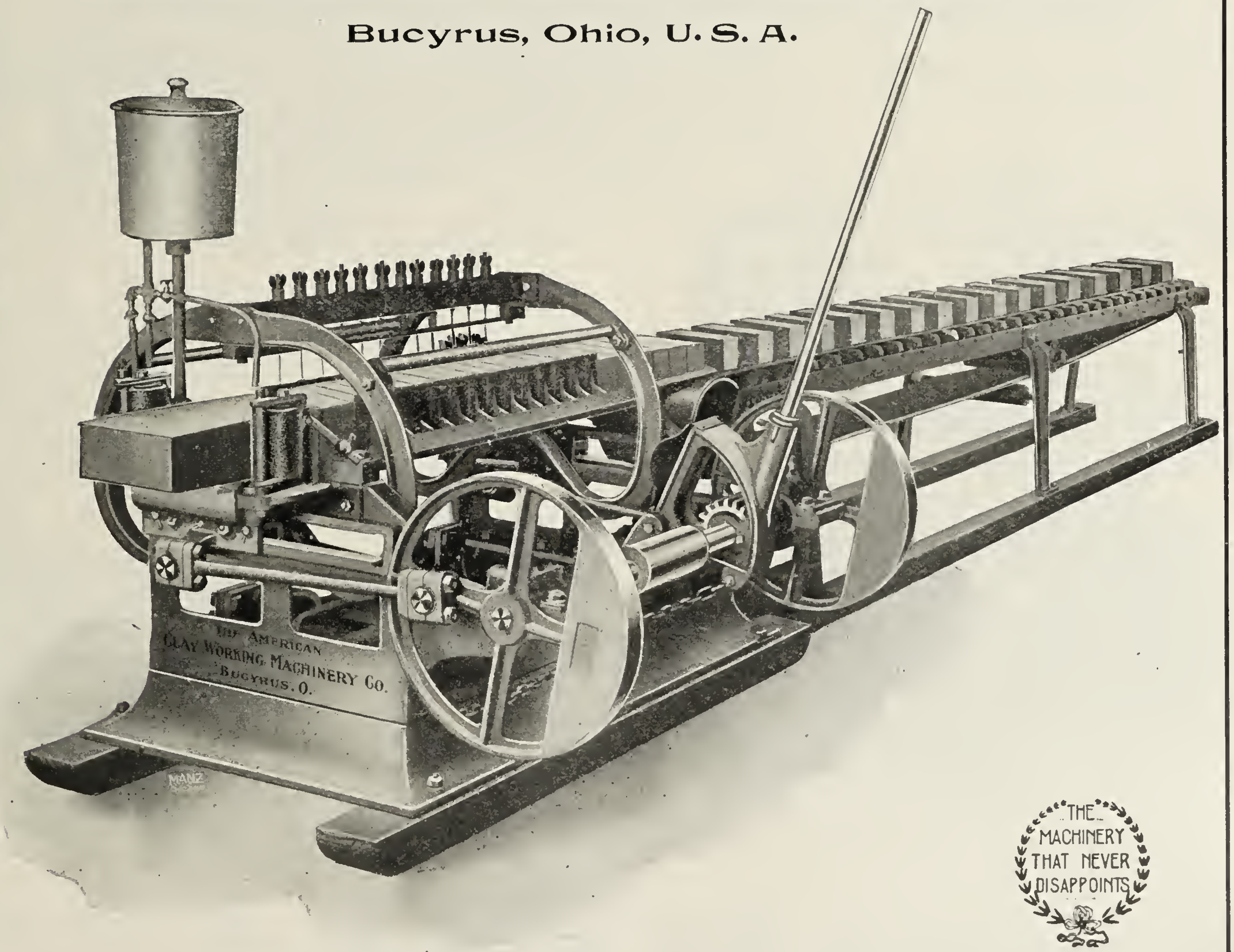
You Can't Make Money By the Cart Load!

It would be foolish for us to say you could make money by the cart load in the manufacture of clay products. If money came so easily every one would be manufacturing brick or tile, but there is money in the business, lots of it. It requires proper methods of business and manufacturing to make it. There are many successful clayworkers who have made fortunes out of clays. They ran on business principles and succeeded.

We say emphatically that our machinery will save you more money and make you better product than any other line. We can not guarantee to make a fortune for you, but we can help you to run profitably by equipping you properly. We manufacture every machine and appliance used in the clay trade. Write for particulars on what you need. Complete catalogue free.

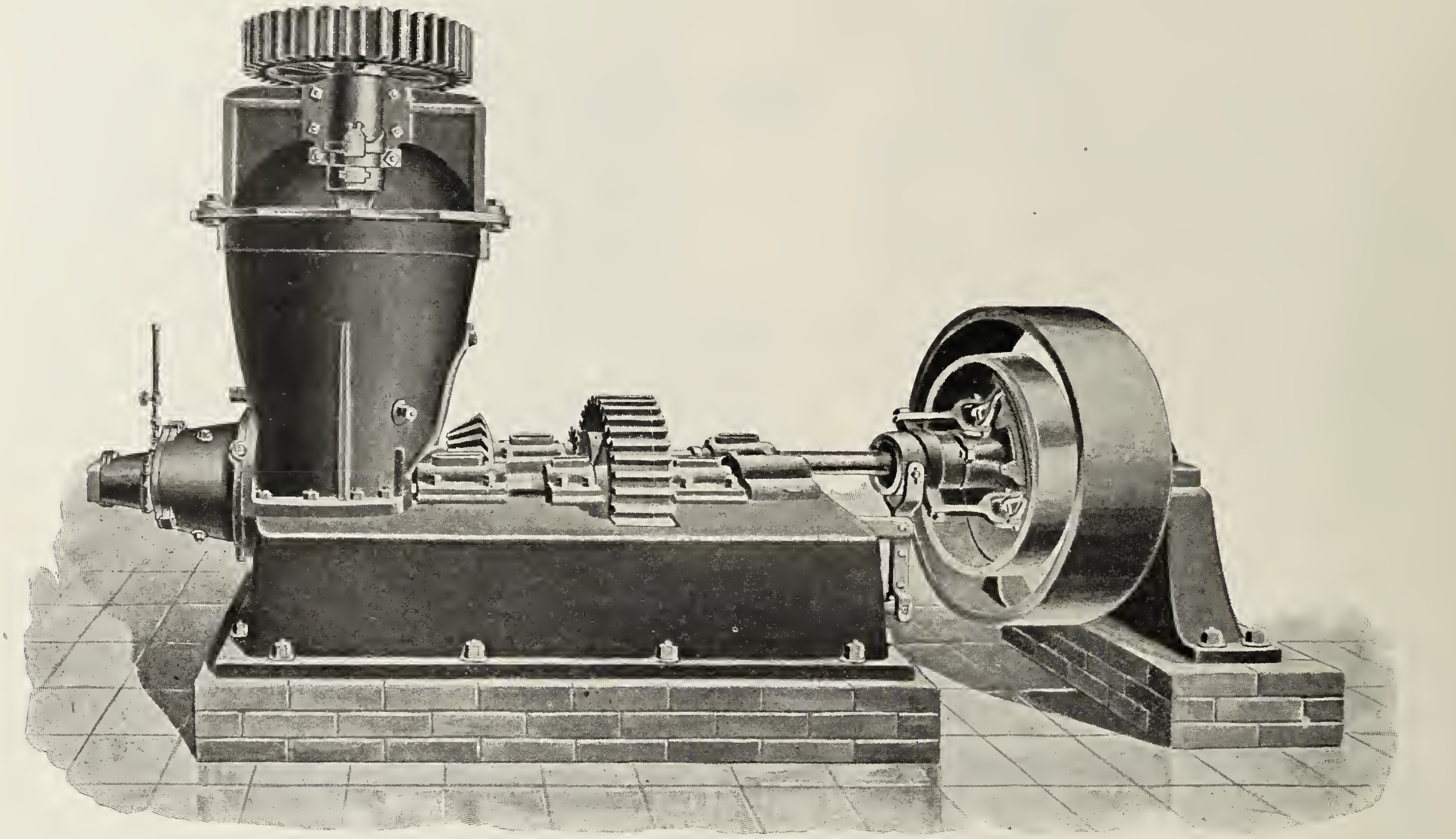
The American Clay-Working Machinery Company,

Bucyrus, Ohio, U. S. A.

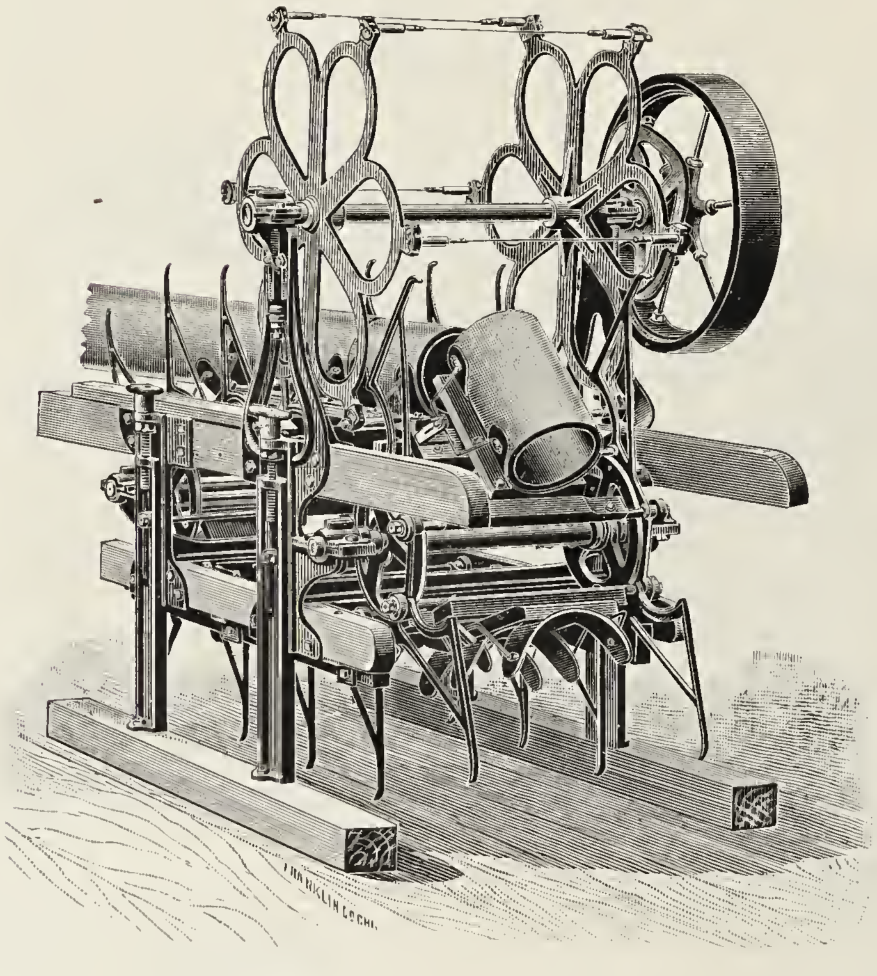


THE MACHINERY THAT NEVER DISAPPOINTS

New Oscillating Down Cut Table.



Brewer No. 10. Daily capacity 50,000 to 80,000 Brick.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Automatic Tile Cutter.

Naperville, Ill., Jan. 24, 1898.

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Yours truly,

MARTIN & VONOVEN.

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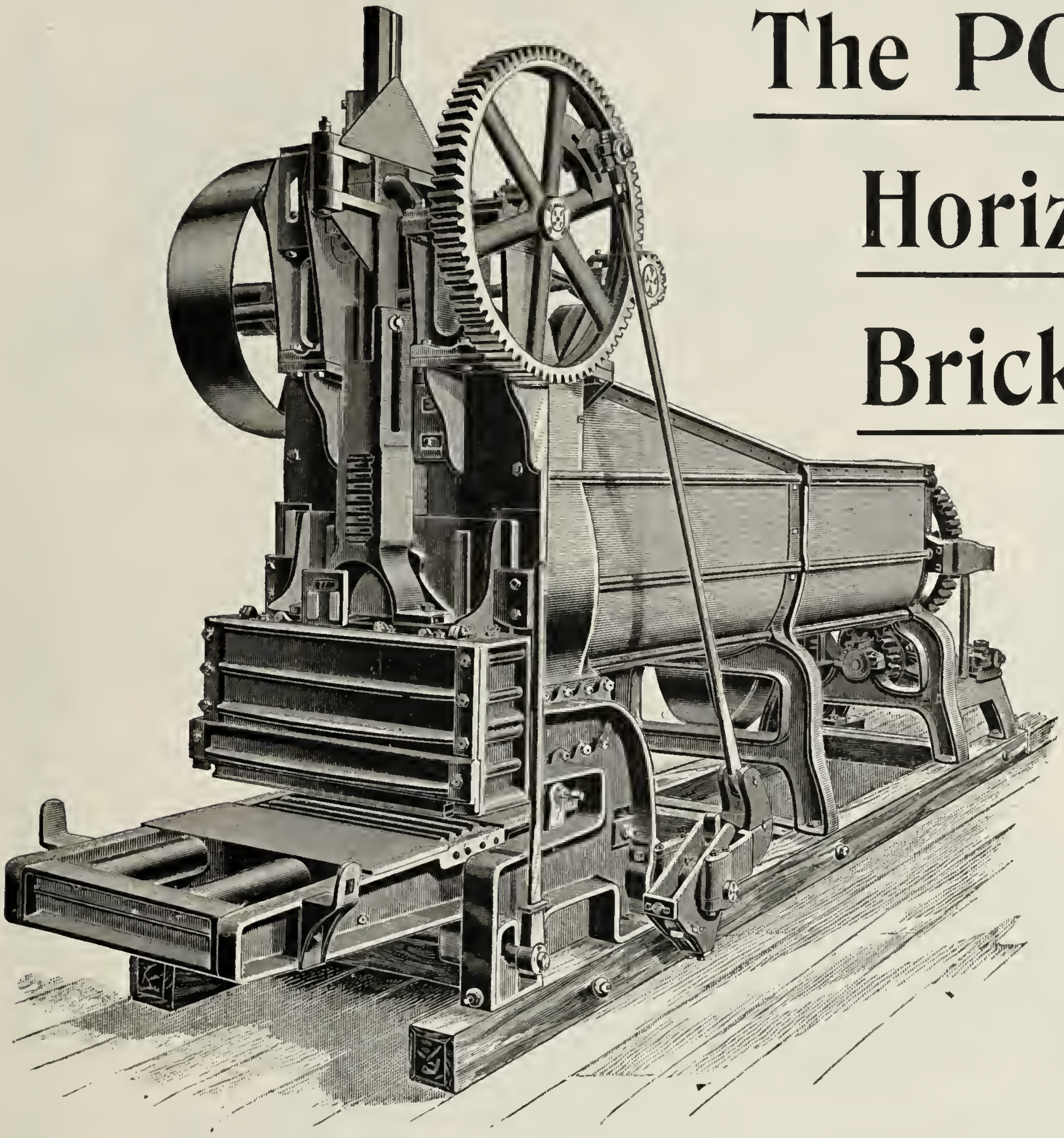

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DISINTEGRATORS

....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

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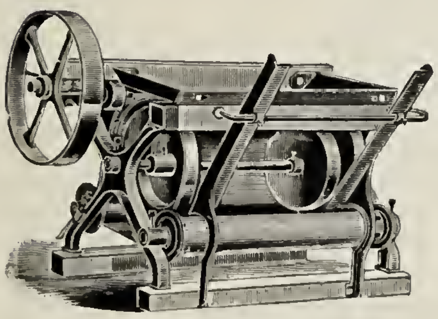

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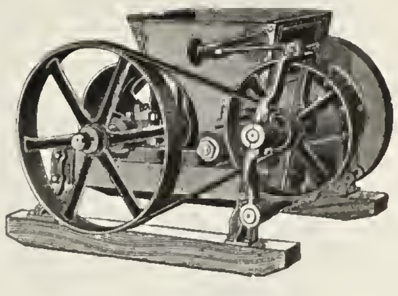

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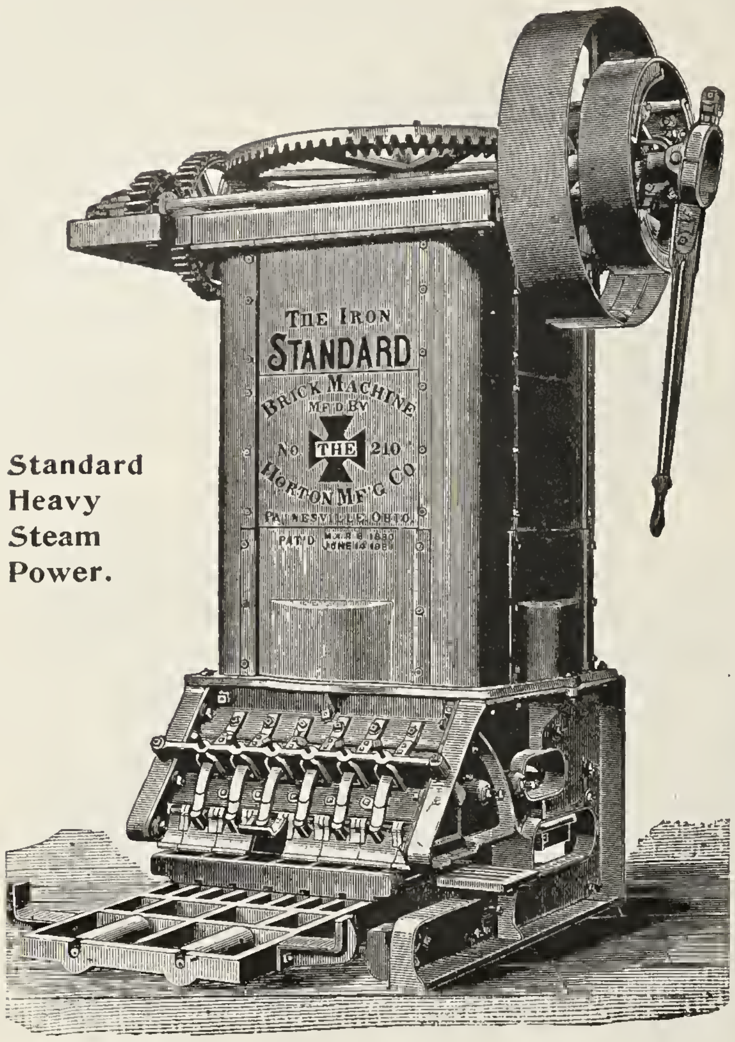

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Heavy
Steam
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The Hercules!

Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

The Standard Machine is just what its name implies.

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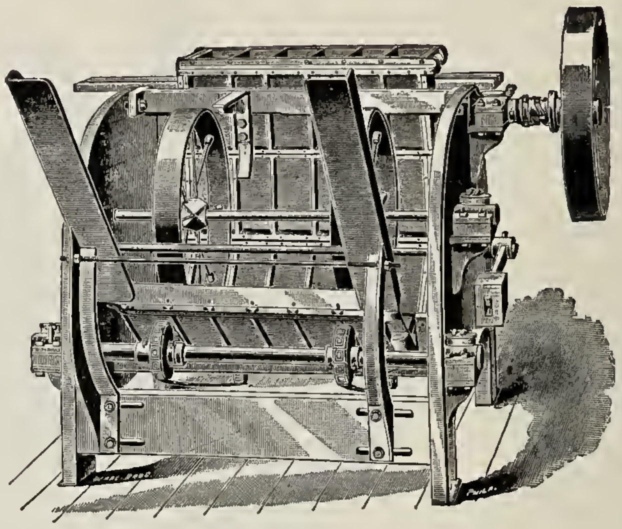

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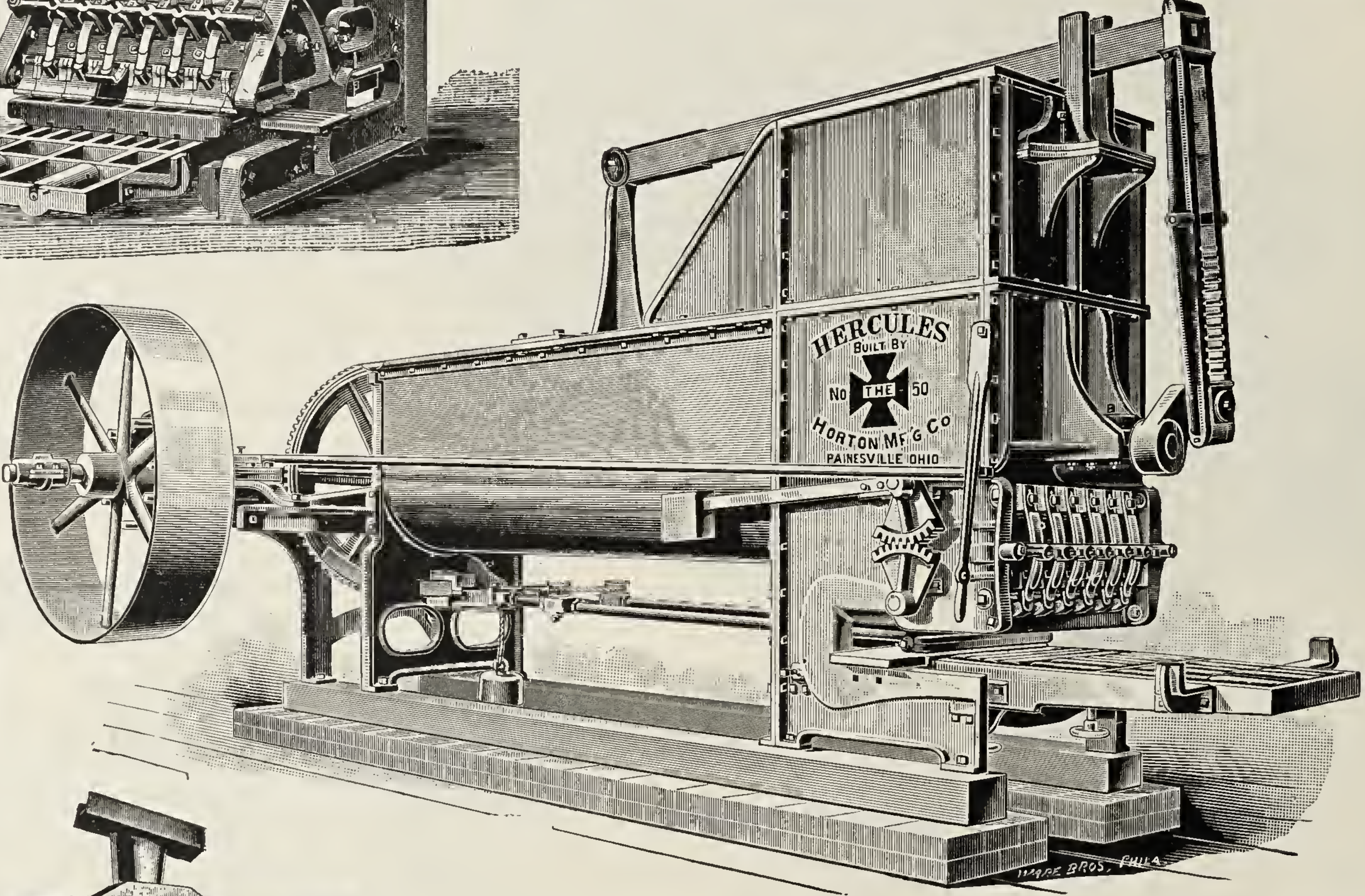
Hercules capacity 40,000 to 50.000.
Weight 15,000 pounds.



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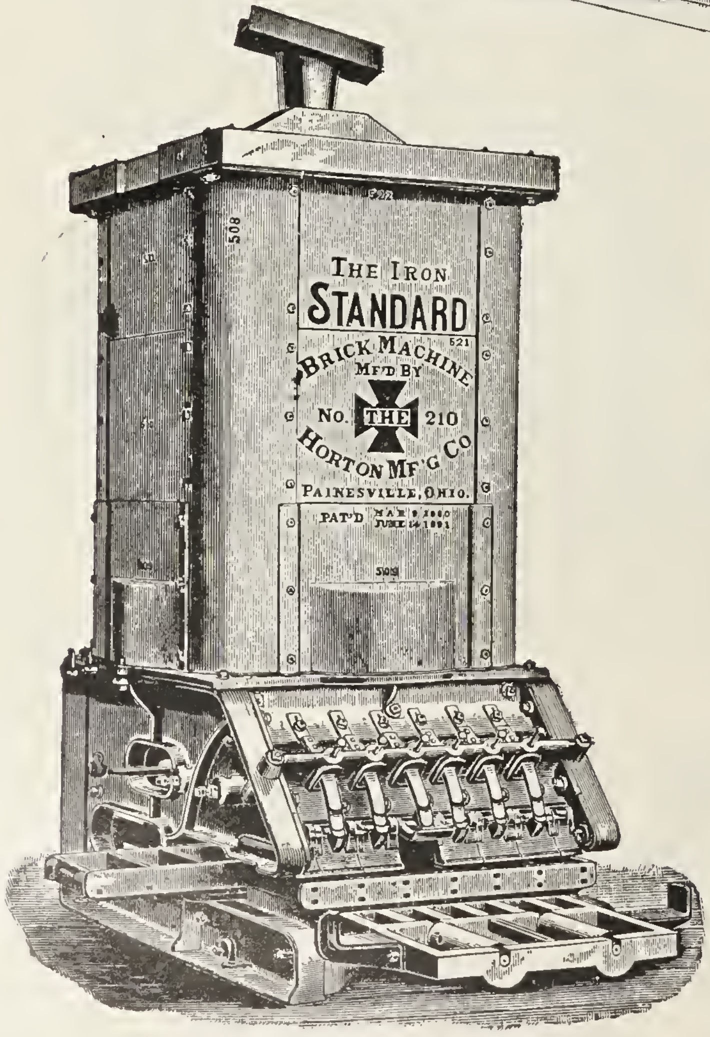
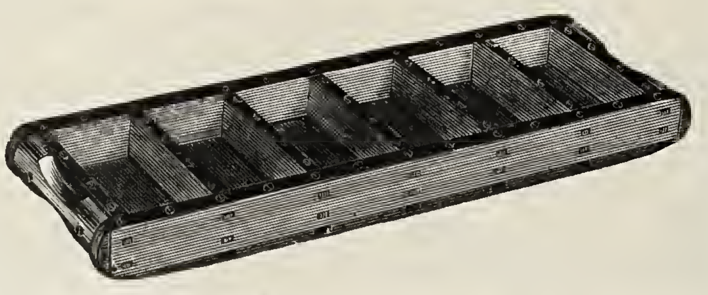


IRON STANDARD HORSE POWER.



WE HAVE recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.

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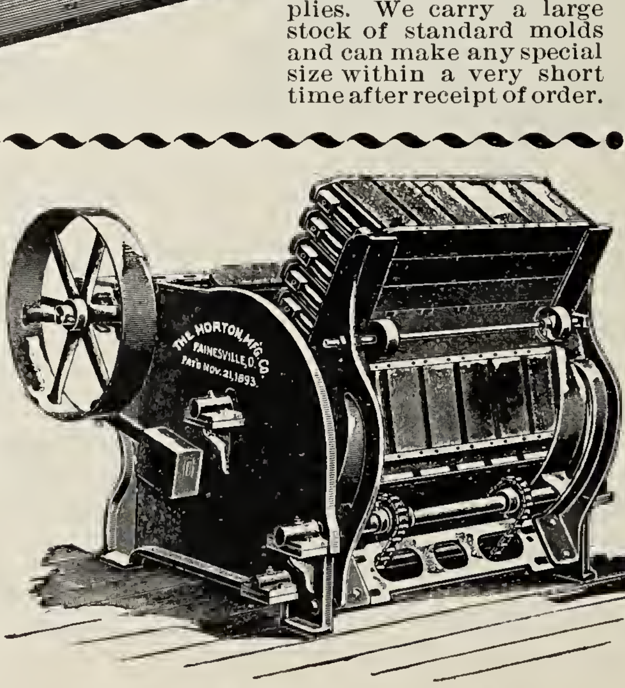
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LANCASTER, PA.
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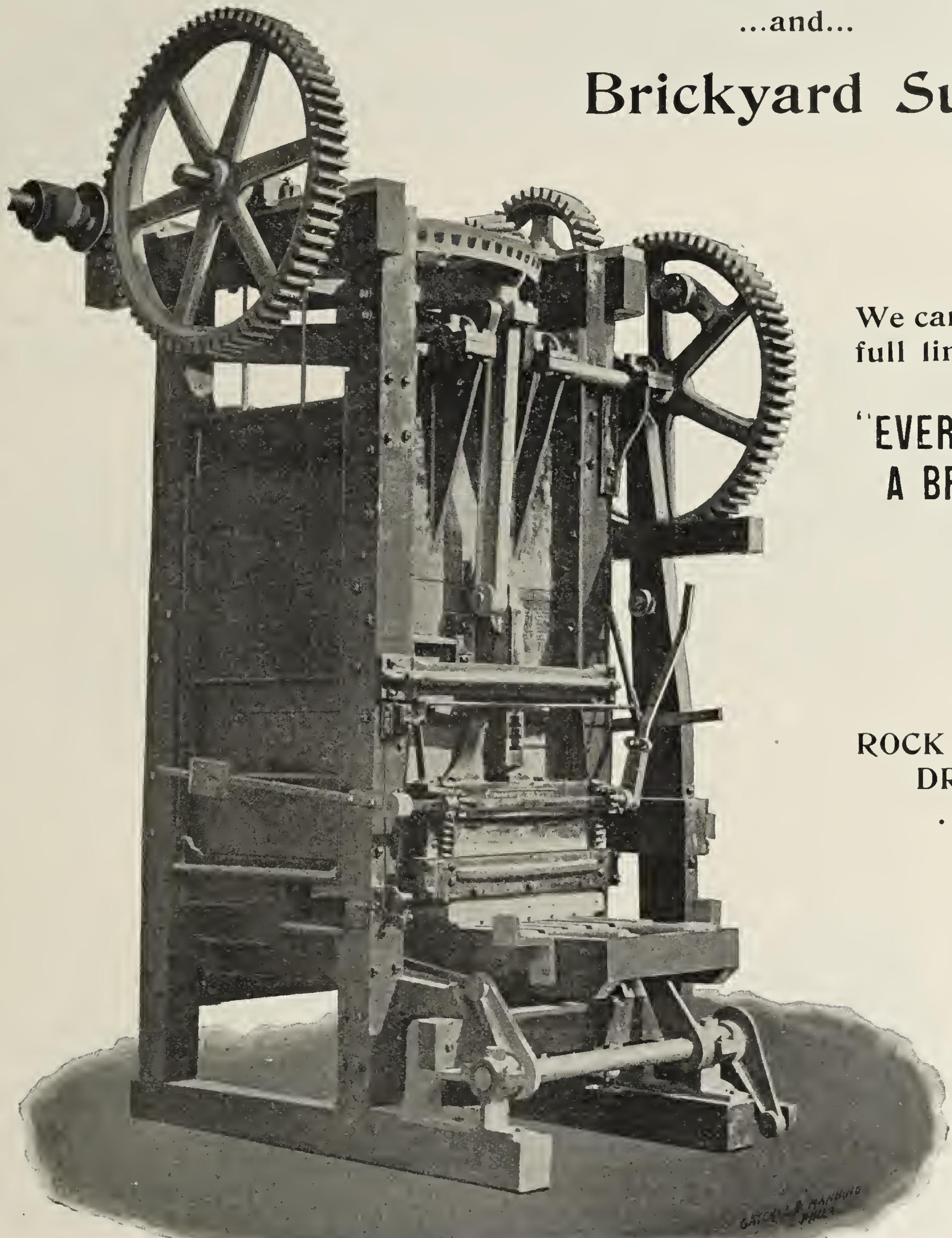
FAVORITE SOFT MUD BRICK MACHINES

...and...

Brickyard Supplies.



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"EVERYTHING A BRICKMAKER NEEDS."

ROCK CRUSHERS,
DRY PANS,
... ETC., ETC.

Brick
Moulds
a Specialty.

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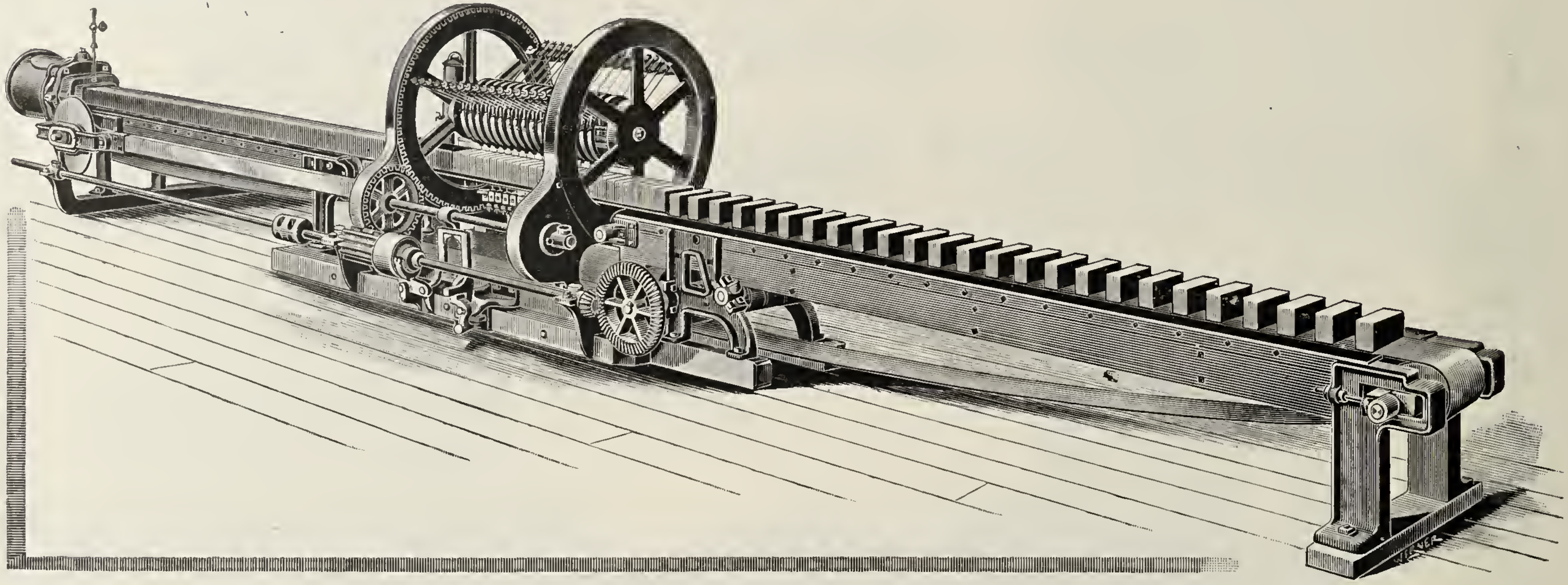
OUR
GENERAL
CATALOGUE.

FINALLY

**Side Cut Brick
Automatically Cut
With SMOOTH EDGES.**



A New Rotating Cutter for Side Cut Brick.

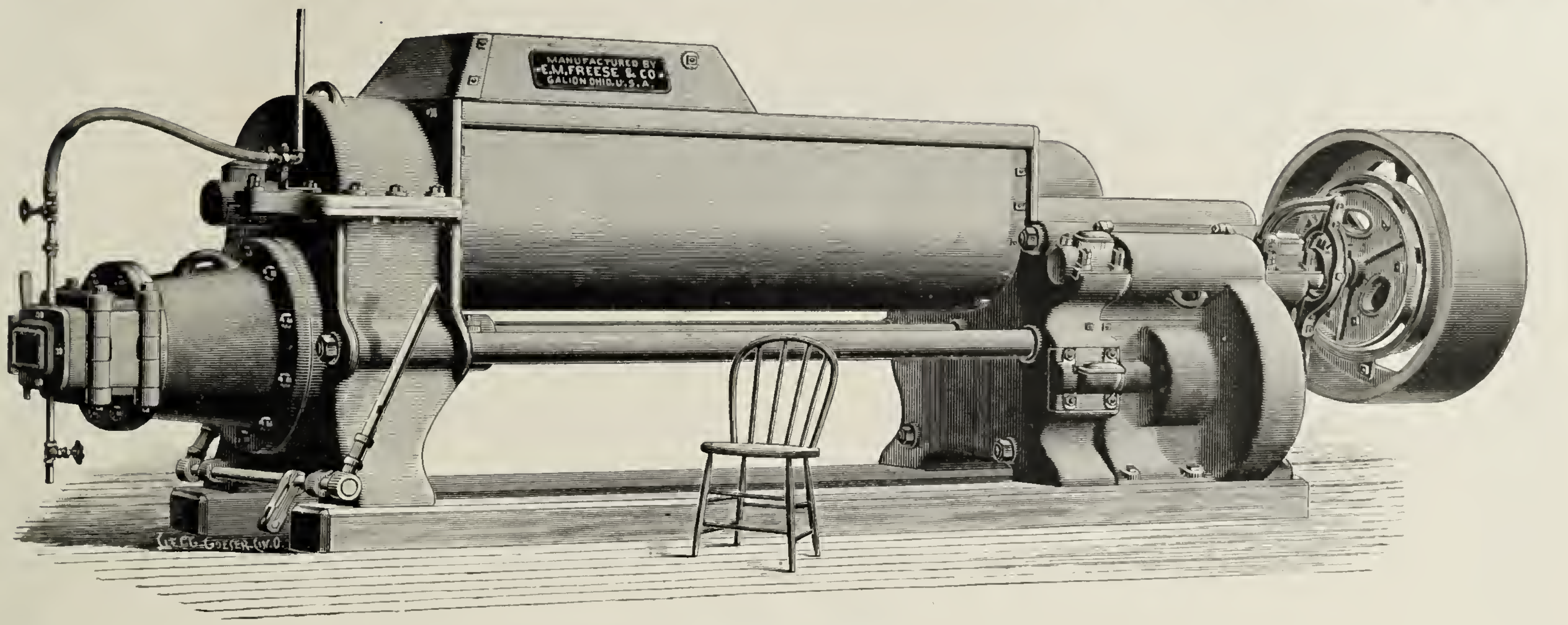
POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick.
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

E. M. FREESE & CO.,

Galion, Ohio.

The Original Union Brick Machines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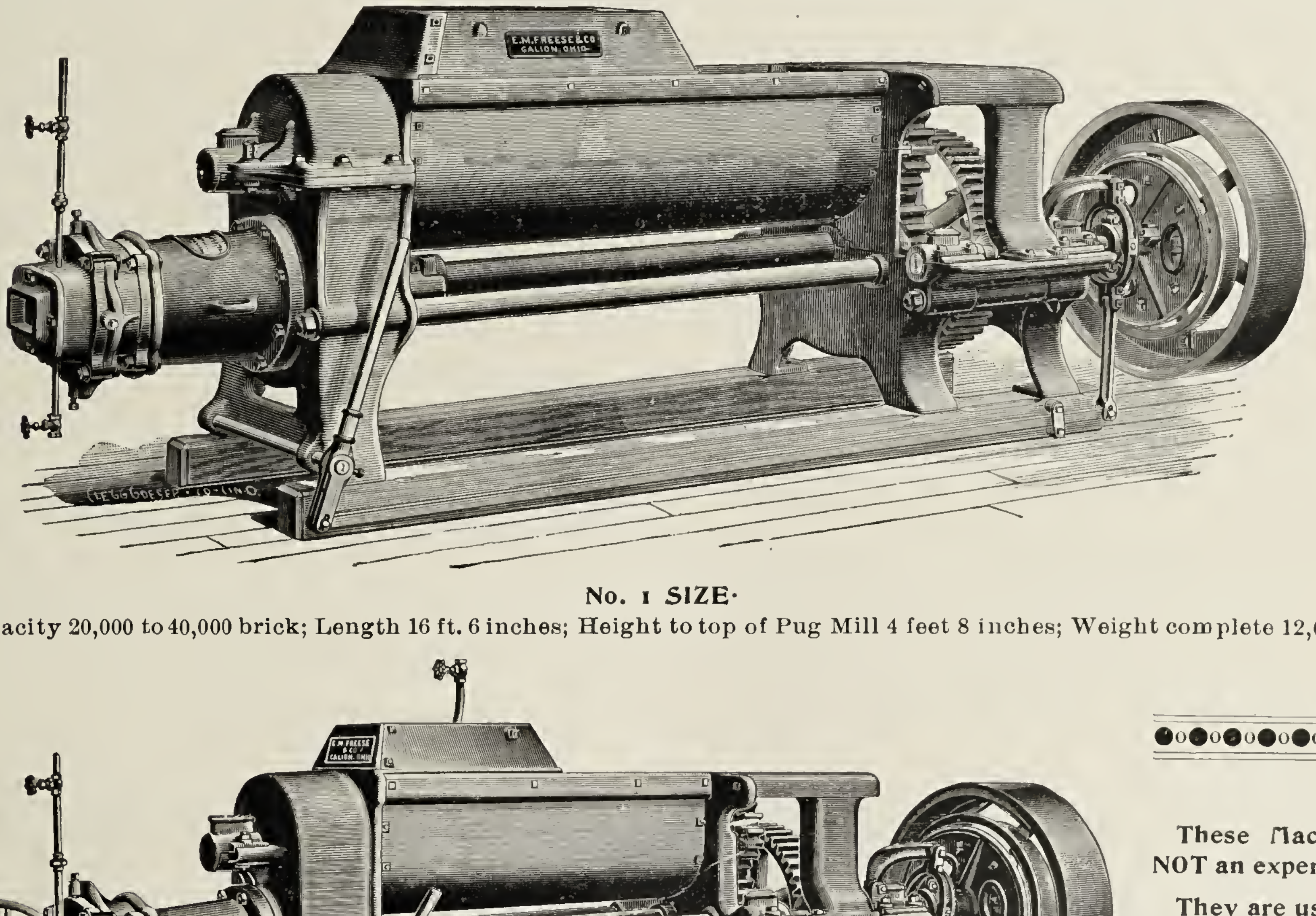
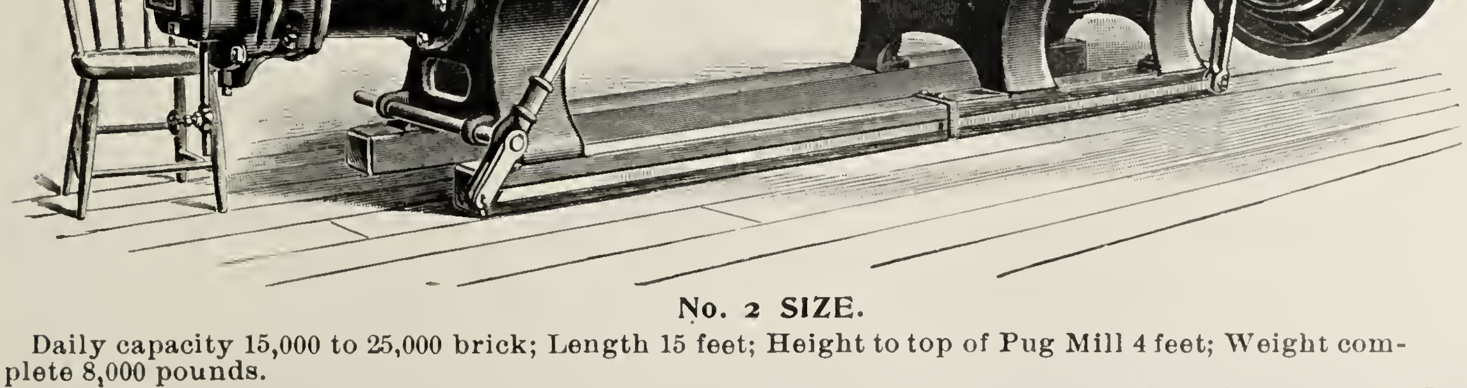
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

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Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

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Brickmakers, ...Attention!

Good times are coming.

If not already with you they are close at hand.

Prices of all commodities are advancing and doubtless going still higher.

These prices will bring profits, some of which will be spent for brick structures.

You can make money during the next three or four years if you are ready.

If not ready you should get ready quickly and have your share of the good times.

If your old machinery is breaking frequently and causing vexatious delays it is time to put in better.

You can save money by buying a "**New Haven**" machine and have it set up this fall. You will need it early next spring.

With a "**New Haven**" Machine your repair bills will be reduced to the lowest possible point, and you can keep your men employed to best advantage.

With a "**New Haven**" Machine you can make brick that will sell for the best going prices and no kicking.

With a "**New Haven**" Machine you can make money.

Write for information to

The Eastern Machinery Co.,

NEW HAVEN, CONN.

DO YOU WANT THE

BEST BRICK DRYER?

THE CUMMER DRYERS

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel, It is a fuel saver and hence a money maker.

If you want the best and most economical brick dryer don't fail to get our prices. If you want a cheap dryer, its no use to write us for we don't build that kind.

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Read what H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE: 60TH AND HAVERFORD STS.
TELEPHONE 147, W. P.
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Brick Manufacturers,
Residence, 3831 Lancaster Avenue.
3 YARDS: 57TH AND WYALUSING AVENUE. 58TH AND HAVERFORD STREETS. 60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

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Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
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The Cummer Clay Dryer is now in successful operation at many places in the United States. Like our brick dryer it is fully guaranteed to perform its work in the most effective manner possible and in any desired capacity. The **Cummer Dryer** succeeds where others fail. It will afford us pleasure to demonstrate its superiority over all other dryers.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell you troubles to"

The F. D. CUMMER & SON CO.,

CLEVELAND, OHIO.

"A. B. C." The Name You Want on Your DRYER. "A. B. C."

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HEATING AND VENTILATING ENGINEERS
MANUFACTURERS OF FANS, BLOWERS, HOT BLAST APPARATUS, ENGINES
NEW YORK
DETROIT
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Send for Catalogue, and Write us about Your Difficulties; we can help you.

It is the synonym for the economical and efficient drying of

BRICK,
TILE AND
TERRA
COTTA.

American Blower Company,
DETROIT, MICH.

The Peerless System

UP-DRAFT, DOWN-DRAFT and CONTINUOUS KILNS

Is the Acme of Perfection in Brick Burning.

Read What They Say About It.

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"We have been using two of these rebuilt Kilns for the last two years, and the fact that we are now reconstructing another, DEMONSTRATES our ENTIRE SATISFACTION WITH YOUR PEERLESS SYSTEM."

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"Never saw a Kiln work so EVEN and FREE both in watersmoking and burning in all my life. The arches WERE AS GOOD as any other part of the Kiln."

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"After burning the first kiln that was changed, the second time, WE FOUND THE IMPROVEMENT SO GREAT and SO MUCH SUPERIOR to the old up-draft Kilns, that we are now changing our entire system to your PEERLESS PATENT."

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"Your system of burning GOOD HARD BRICK is without doubt THE BEST I have ever seen."

And There are Others.

No matter what you manufacture, or the capacity of your plant, if you make is of clay and want it burned write us for information. If you have kilns that are not giving satisfaction, or from any other cause you cannot burn your ware, write and tell us all you know about the trouble.

J. W. CARSON, Construction Engineer of Brick Works. **Montezuma, Ind.**

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A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS. INCLUDING BRICK TILE TERRA-COTTA SEWER PIPE POTTERY ETC.

T. A. RANDALL & CO., PUBLISHERS.

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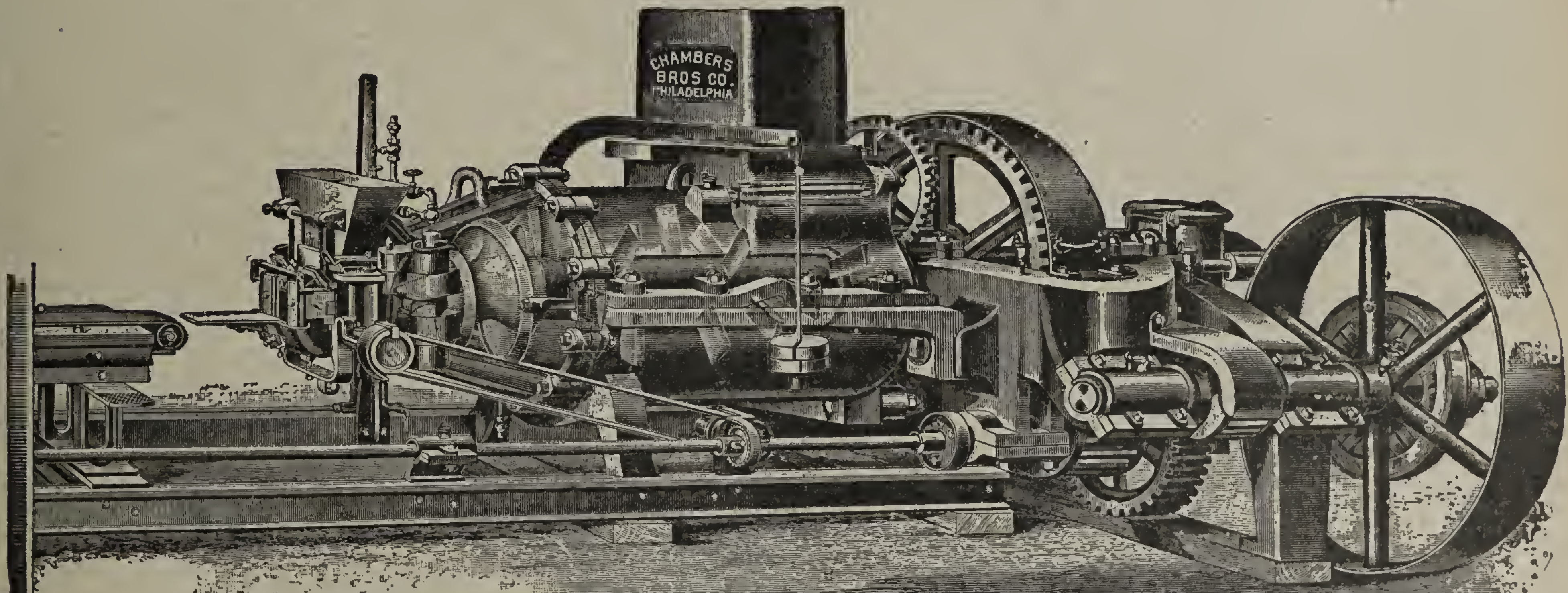
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXII, No. 2. INDIANAPOLIS, IND., AUGUST, 1899. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



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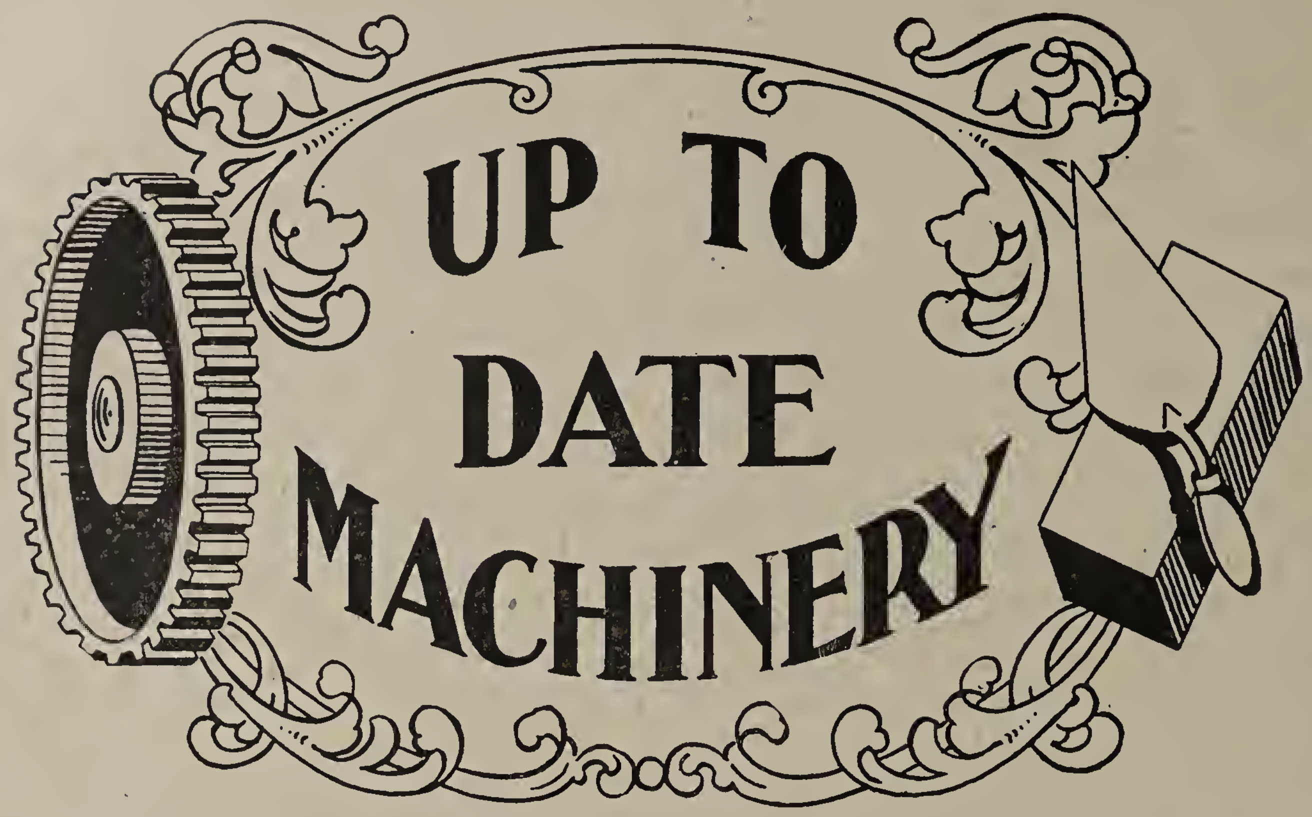
FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.



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Why not get it strictly **UP-TO-DATE?** Machines go out of date soon enough anyway, without buying a back number to start with. All the latest conveniences and improved appliances for making Sand Moulded Brick, Wire Cut Brick, Paving Brick, Drain Tile, Fire Brick and Pressed Front and Ornamental Brick, can only be found on our machines. Chicago is a strictly Up-to-Date town, and we are right in the middle of it.

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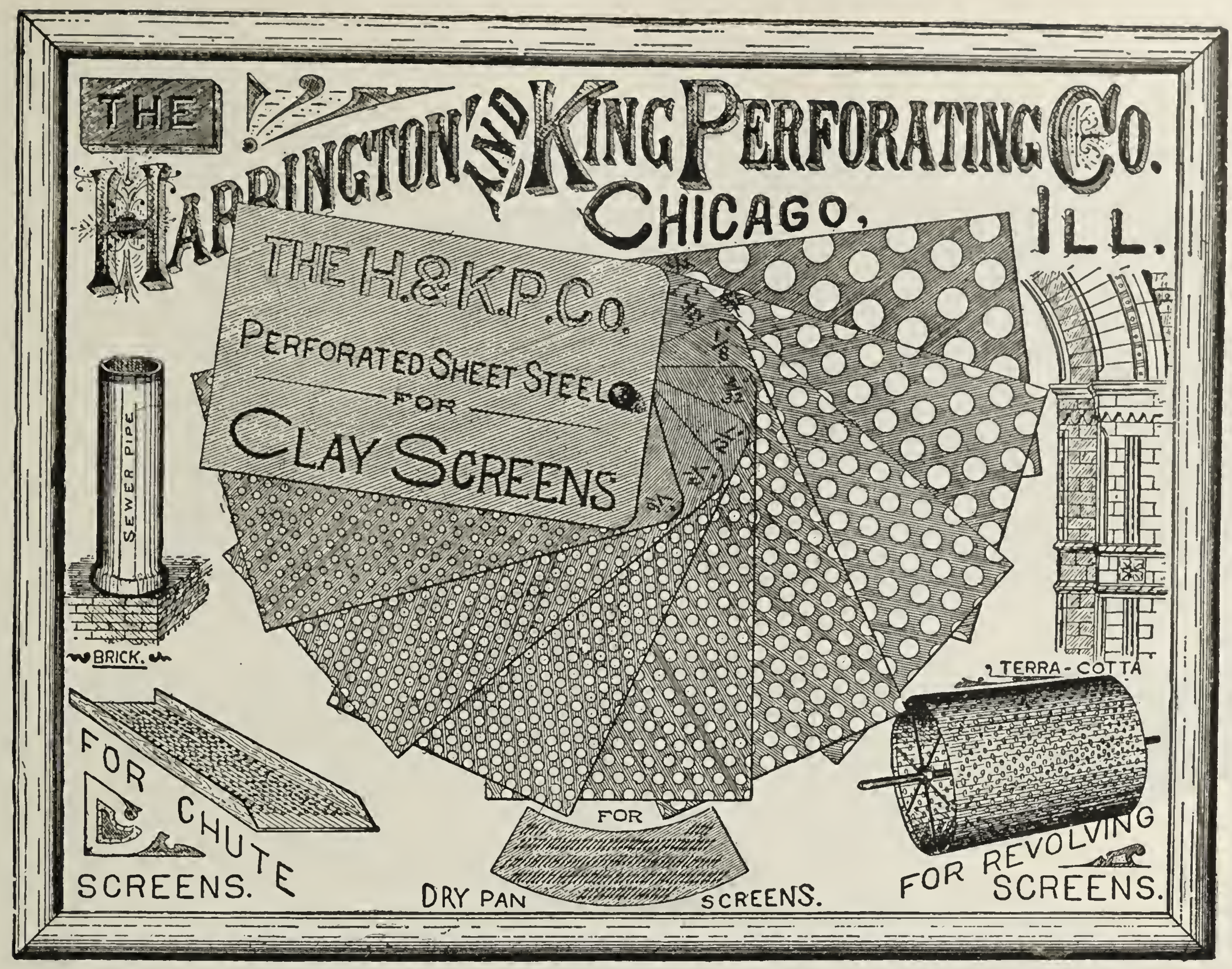

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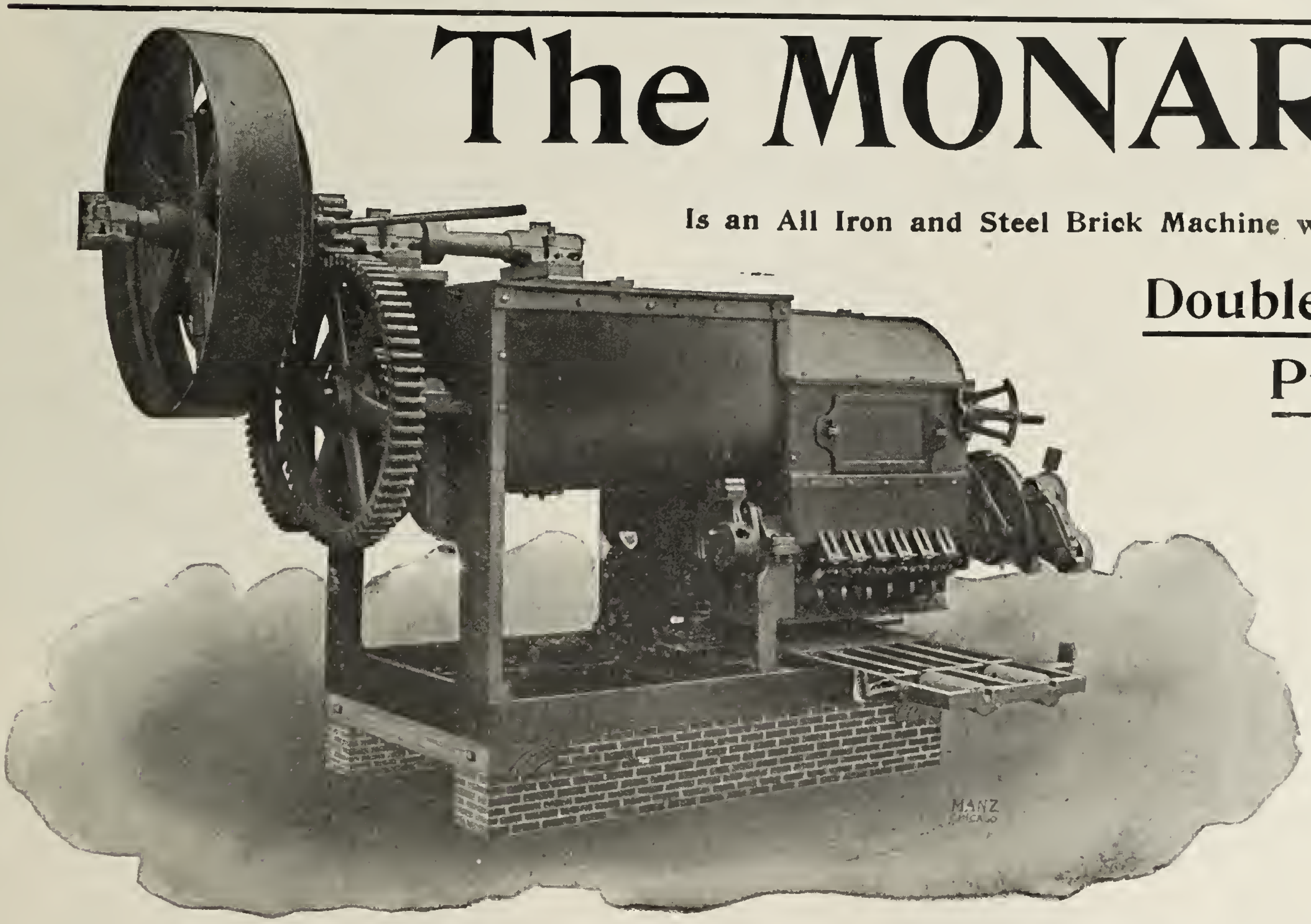

Is an All Iron and Steel Brick Machine with

Double Pug Mill.

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SIMPLE
IN CONSTRUCTION,
DURABLE
AND . . .
POWERFUL.

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Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for 1899 Catalogue.

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W. L. KIDNEY, Sales Agent, Capetown, South Africa.

America's Greatest Brick Machine

A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

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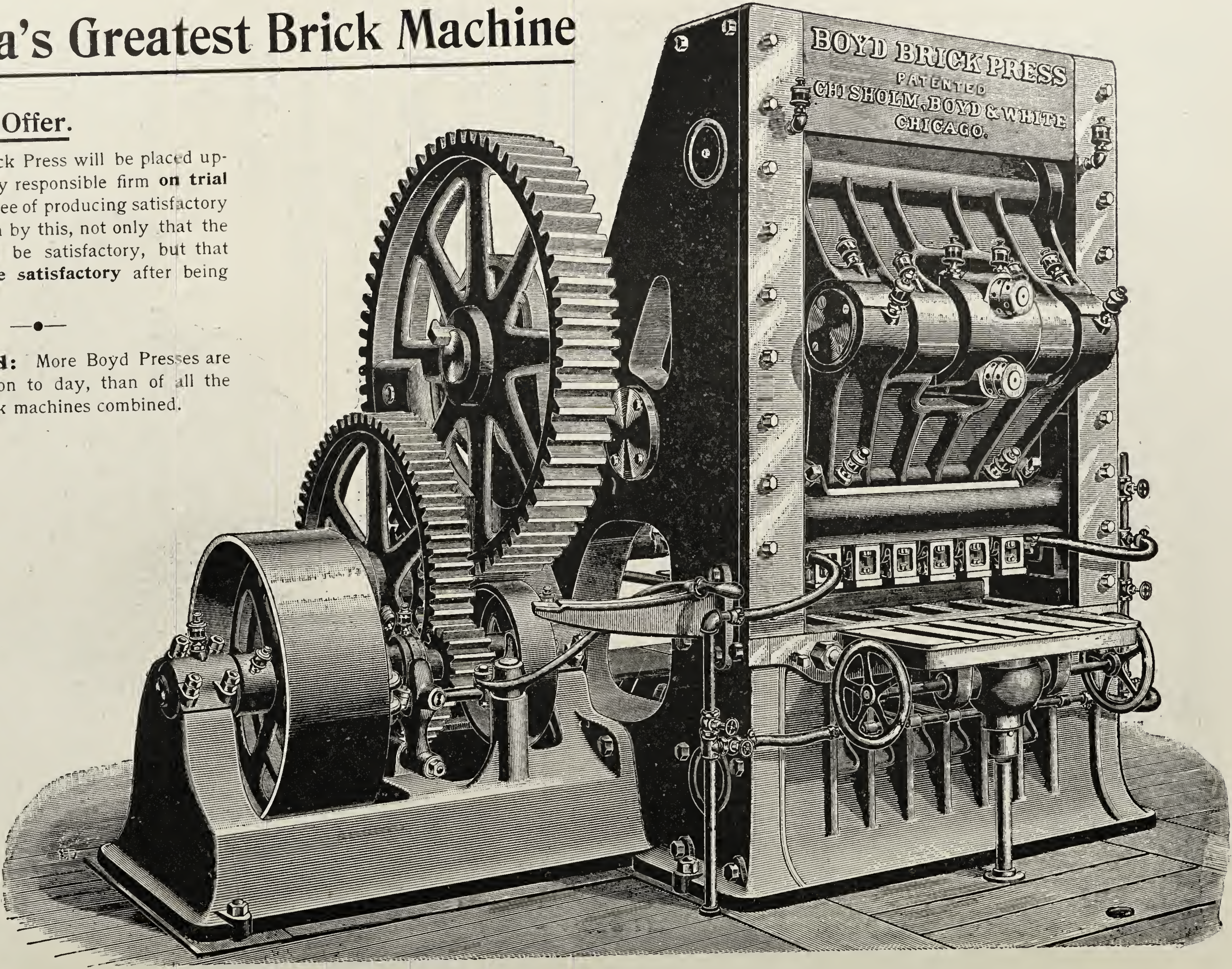
Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



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57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

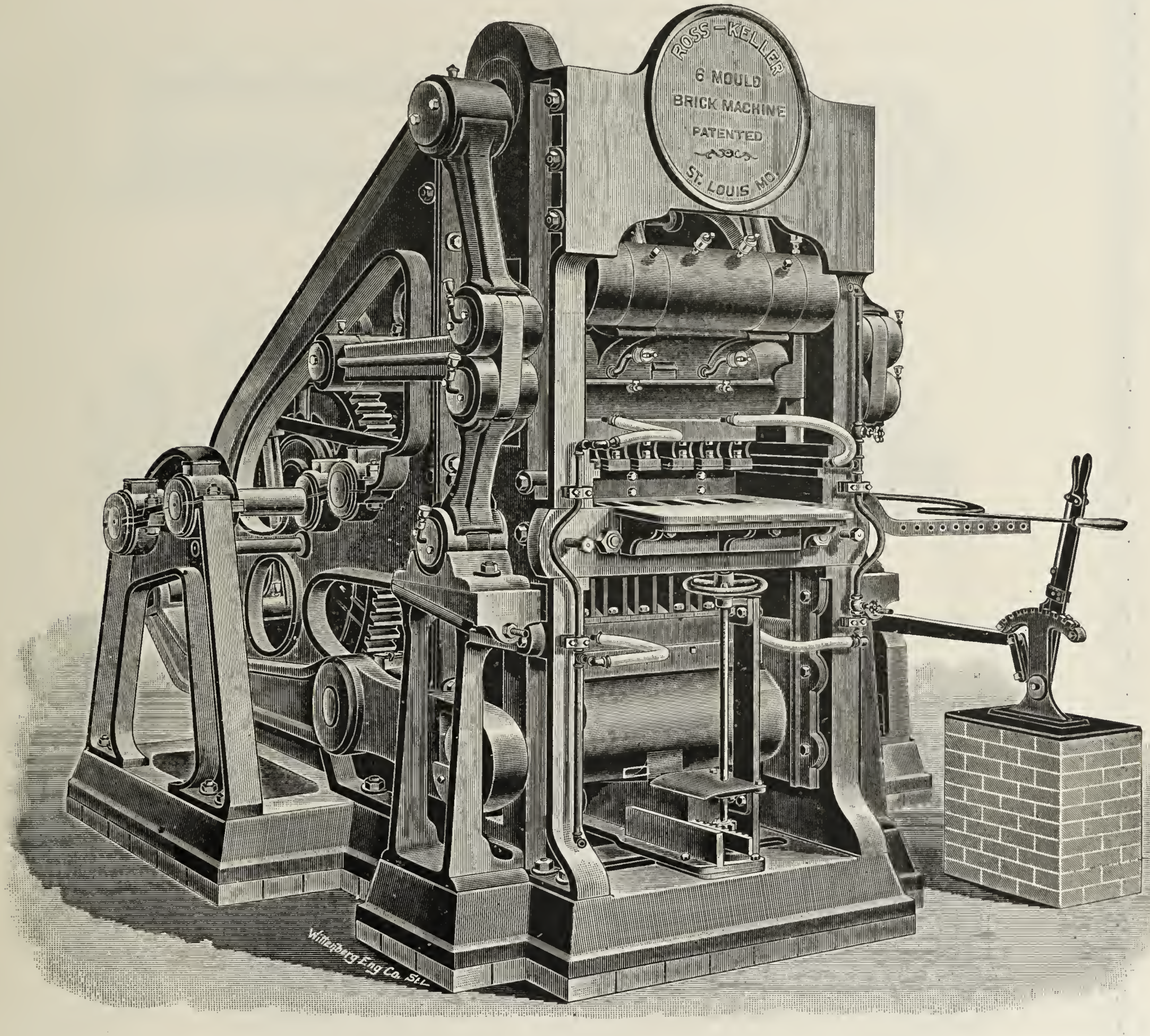
CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The Latest Improved

Ross-Keller TRIPLE·· PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

BRICK SET IN KILN DIRECT FROM MACHINE.



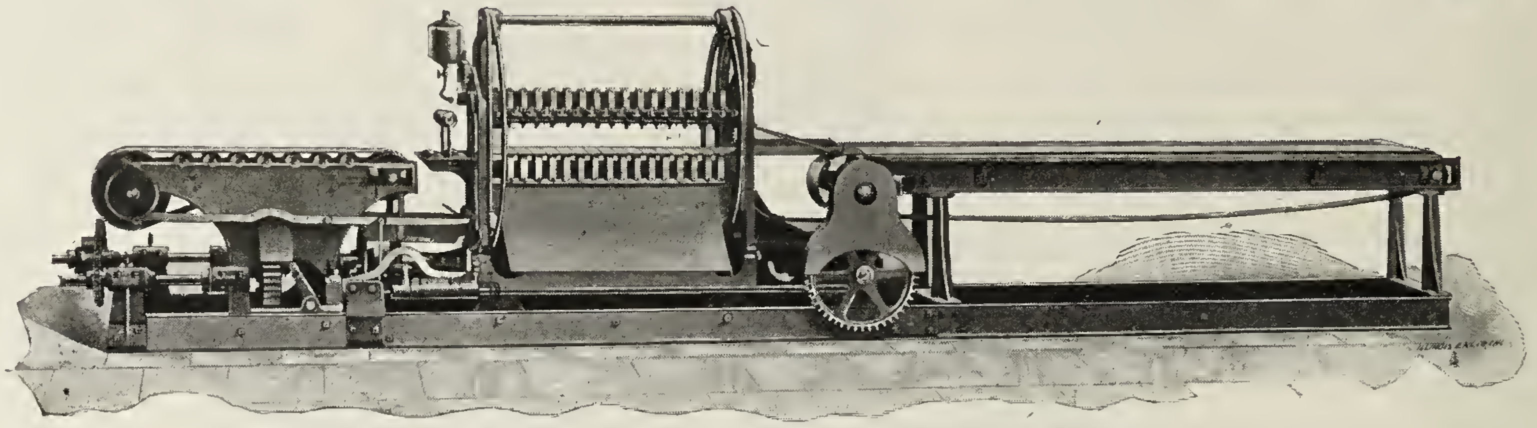
The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made. Press is guaranteed for two years against breakage.

If you want the best come and see us, or write for price and full particulars, address

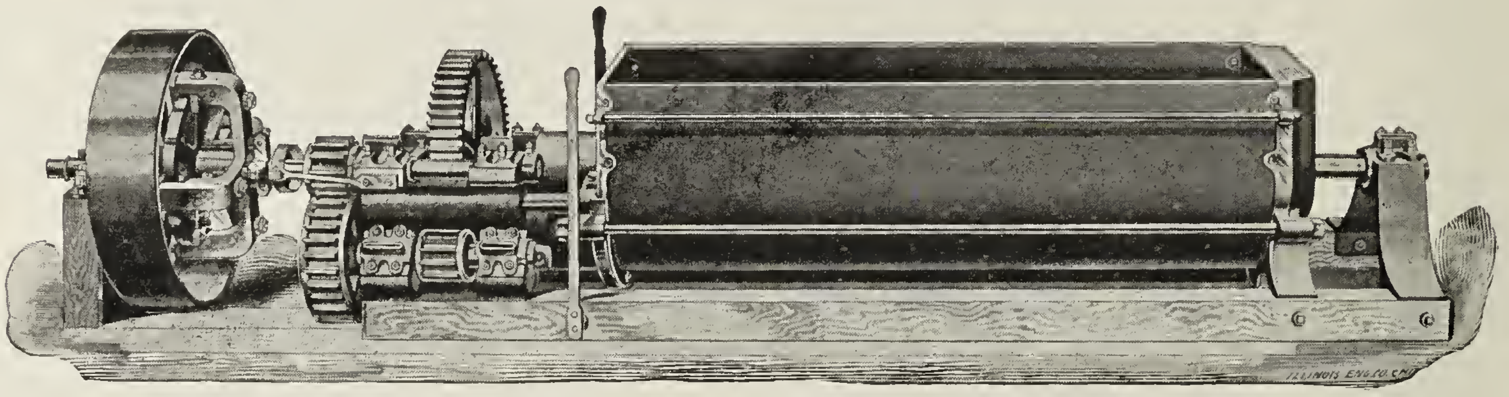
Ross-Keller Brick Machine Company,

915 Holland Building, ST. LOUIS, MO., U. S. A.

The Wonder Clay-



Cunningham's Improved Combination End and Side Cut Automatic Brick Cutter.



Open Top Pug Mills of any size and capacity desired.

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WONDER BRICK AND TILE MACHINES WILL WORK ANY CLAY THAT IS ADAPTED TO THE STIFF CLAY PROCESS.

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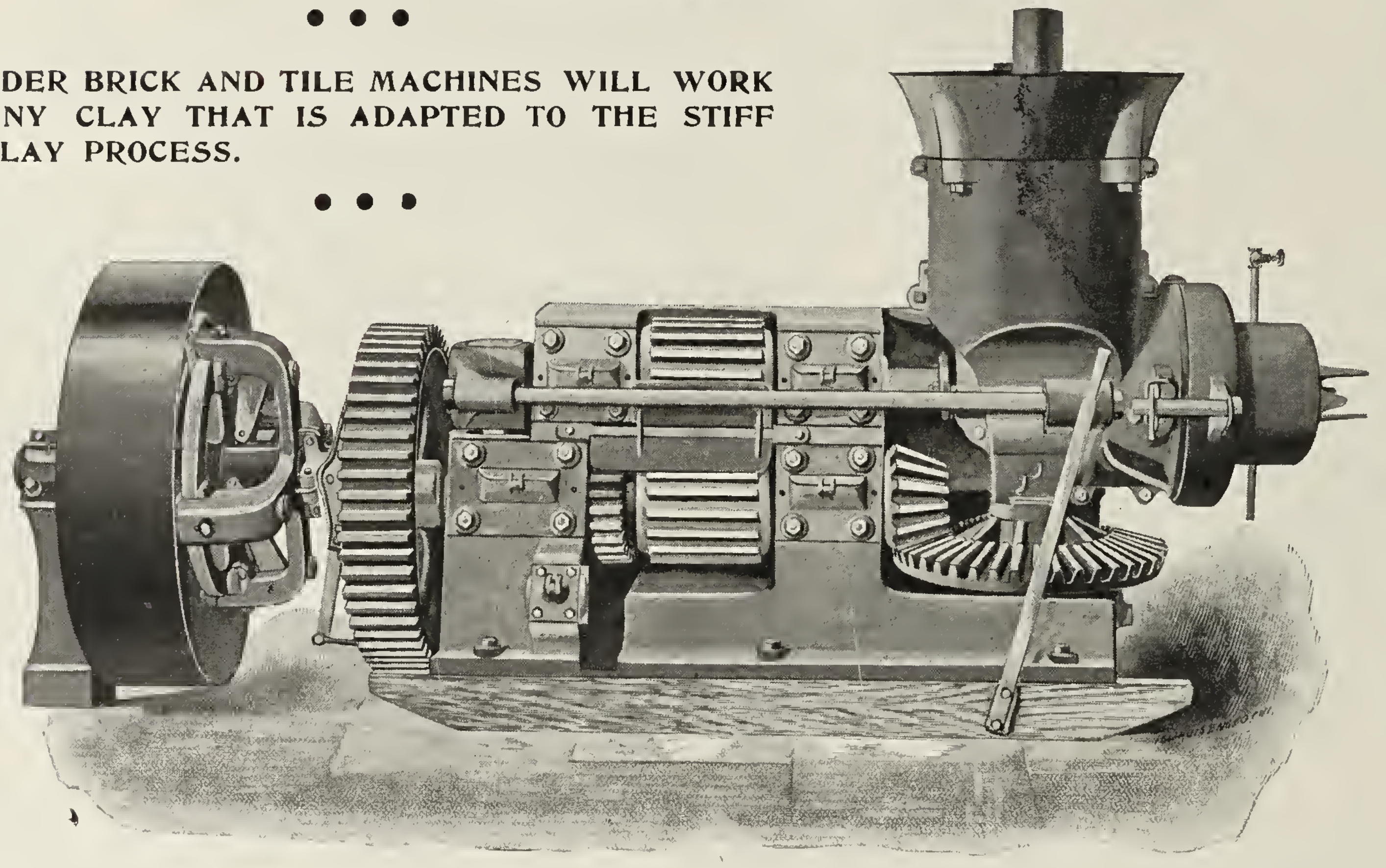

Wonder Brick Machines, made in four sizes, with capacity ranging from 20,000 to 100,000 brick per day.

If you Want the Best Brick and Tile Machinery, Don't Fail to get Our Prices.

THE WALLACE

CHICAGO AGENTS:
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Working Machinery

The Battle Ship Oregon was not built by the oldest and largest Ship Building Works in the World, but she was a record breaker for low cost for repairs. So with the **Wonder Brick Machines** as the following letter testifies. This is the second Season this machine has been run.

GRAND RAPIDS, MICH., July 22, 1899

THE WALLACE MFG. CO.,
Frankfort, Ind.

Gentlemen:—Will you please send us by freight the two knives that fit on the horizontal shaft, Big Wonder, as the old ones are badly worn. Also send us your catalogue price list.

We are making 50,000 brick per day regularly on the Big Wonder. Have not started up any of our other machines this season, as the one machine fills our yard completely, which holds as you know 500,000 brick, requiring two gangs of wheelers and setters. We have never broken so much as a bolt, closed down the machine a minute for readjustment, or paid out one dollar for repairs since starting. We wish you abundant success.

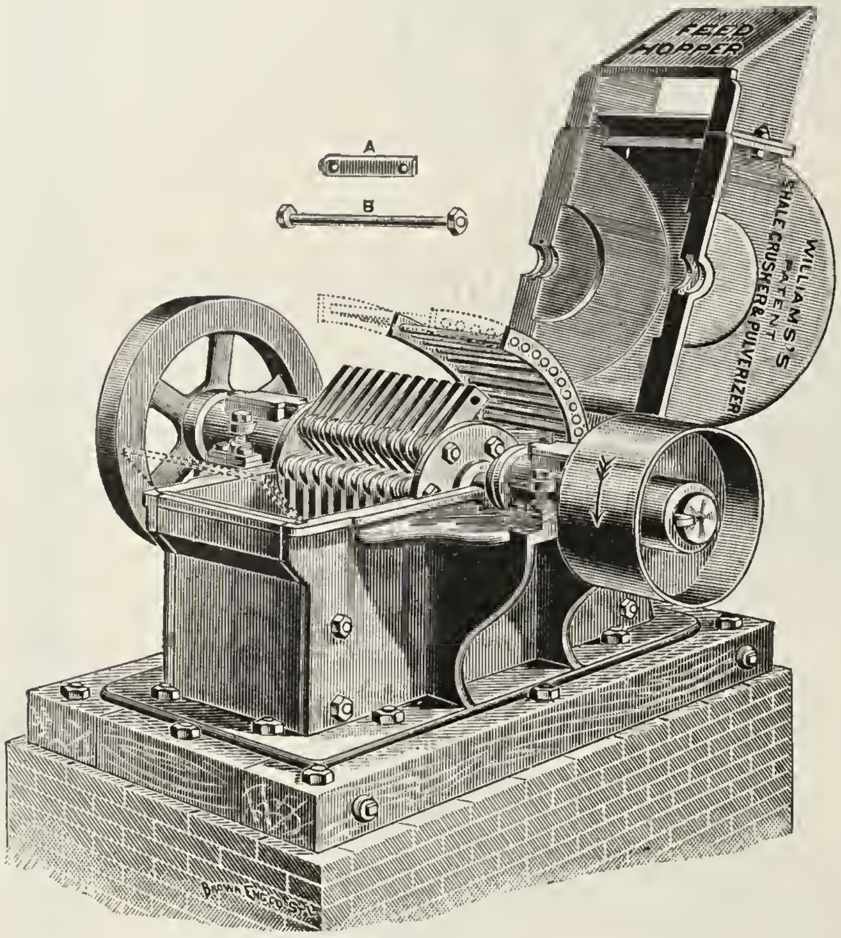
Very respectfully yours,
GRAND RAPIDS CONSOLIDATED BRICK & TILING CO.

You will find seven **Wonder Brick Machines** in Grand Rapids and vacinity.

MANUFACTURING CO.,
Frankfort, Indiana.

The WILLIAMS PATENT CRUSHER & PULVERIZER Co.,

of St. Louis, Mo., U. S. A.



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With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

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The Williams Patent Crusher and Pulverizer Company,

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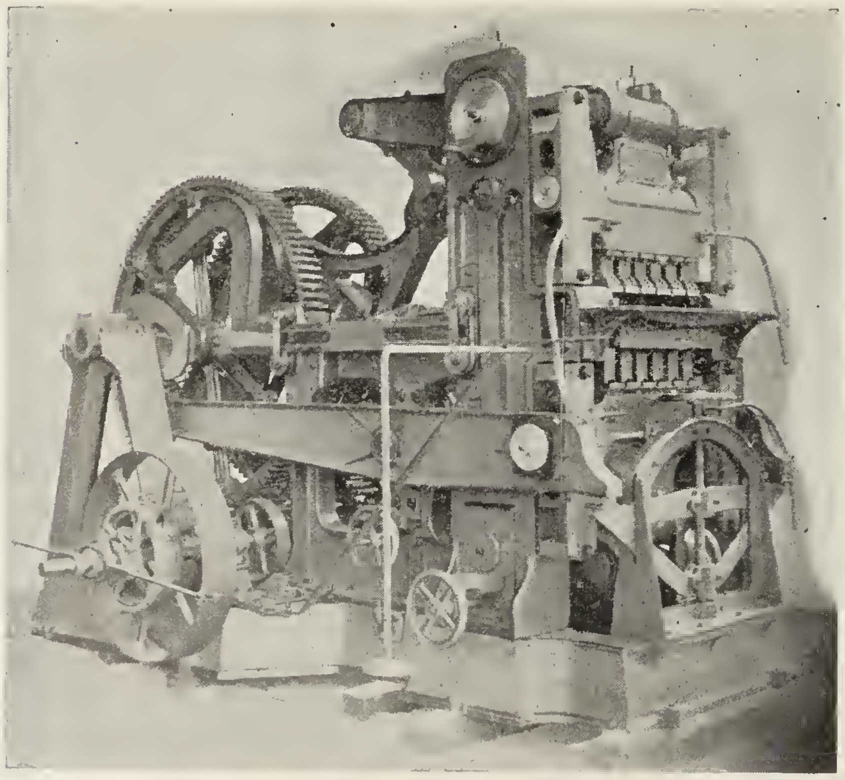
The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, DURABILITY and SIMPLICITY.

The lightest running Press in the market, requiring only 6 to 7 horse power to operate the largest 6-mold press. All parts subject to strain are made of the best bessemer steel, and can be seen and gotten at easily. The thickness of the brick can be changed and regulated without stopping the press, and every press is fitted with the Fernholtz mold, which is admitted to be the best in use. For fine pressed and ornamental brick, this machine cannot be equalled, the pressure on, and movement of the clay in the mold being such as to prevent granulation, and insures the most perfect product possible. We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer,** and the **Fernholtz Clay Mixer** in our own factory and guarantee them fully.

The opinion of those using our press and full information on application.

The Fernholtz Brick Machinery Co.,

1214 and 1216 Poplar Street,
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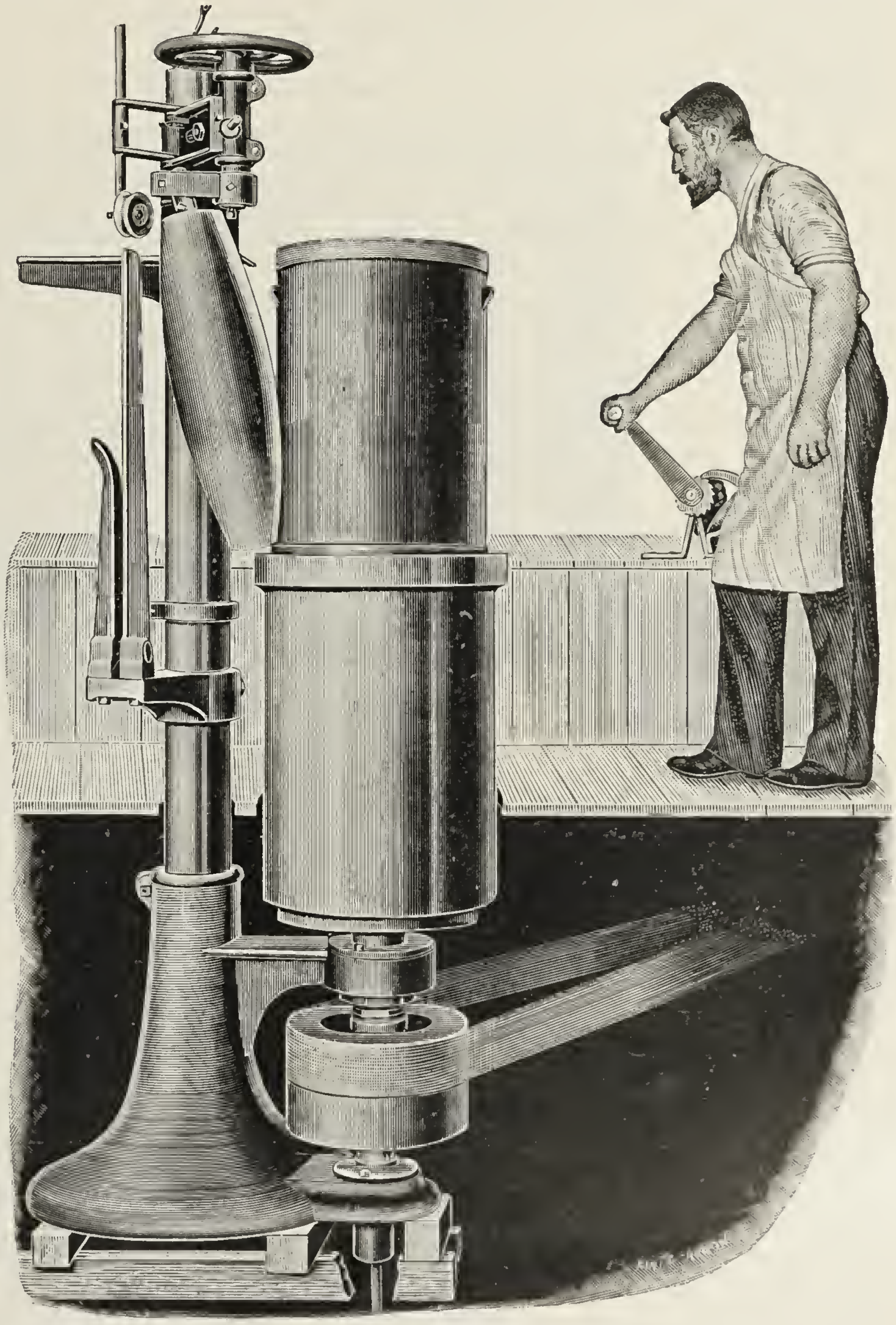
The BEST

Large Pottery Ware MACHINE ON EARTH.

RANGE 6 TO 60 GALLONS.
80—30 GALLON TUBS MADE IN 10 HOURS.

ALWAYS IN ADVANCE
READY TO MEET YOUR REQUIREMENTS



Our Reputation for
Superior Machinery
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**POTTERY,
SEWER PIPE AND
DRAIN TILE
MACHINERY.**

TAPLIN, RICE & CO., AKRON, OHIO, U. S. A.

The Standard Drier

FOR BRICK AND TILE.

We are very much pleased with your Drier—it does even better than you guaranteed.

This is very gratifying to us as our first experience with Driers was very discouraging; in fact, a failure both as to drying and handling our material. The great mistake we made was in considering a proposition from and awarding the contract to a party who made us a lower price than yours, on our first Drier. In buying the second time we did not consider a bid from the first builder at all. Now we see the difference. There is no comparison between the two Driers, neither in equipment, workmanship or system.

Respectfully,
ENSLEY BRICK CO.,
Ensley, Ala. *H. L. Finkler, Sec'y.*

EVIDENCE OF SUPERIORITY.

Hundreds of Testimonials. Ask for them.

Ensley Brick Co., Ensley, Ala.

ADDITIONAL PROOF.

What others say is What Counts. Ask for Catalog. It tells all about THE STANDARD DRIER.

Gentlemen:—The Steam Drier you put in our plant has been in use one year, it has been subjected to trying tests. Beginning in the Winter with the clay wet and sloppy, and the shale full of frost, our soft mud brick entered the dry house cold and clammy. Under the scientific yet common sense method of distributing the heat and nature's own way of carrying off the moisture, our brick came from the Drier. sound and thoroughly dried and free from checks or fracture. We dry our soft mud shale brick in 24 hours and our brick made from clay in 48 hours. The Drier is easily controlled, in fact it runs itself with no expense so far, for repairs or renewals; all that is required is steam sufficient to keep the temperature at 120 degrees at the receiving end, and about 165 degrees at the discharging end.

The cars we purchased of you are the best and most practical we have seen. In fact the Drier with its outfit is to us an agreeable surprise, in the matter of durability, practical use and expense on account of repairs.

Yours very truly,
THE ADAMS BRICK CO.,
Indianapolis, Ind. *J. C. Adams, Pres't.*

The Standard Dry Kiln Co.,

186 South Meridian Street. ***INDIANAPOLIS, IND.***

THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. XXXII. INDIANAPOLIS, IND., AUGUST, 1899. No. 2

Written for The Clay-Worker.

THE CLAYWORKERS' ART.

Some Remarkable Figures for the Decoration of the "Avenue of Fame" Through Which the Members of the G. A. R. will March During the Philadelphia Encampment.

ARCHITECTS, G. A. R. MEN and newspaper men galore recently tramped through the spacious terra cotta works of Stephens, Cooper & Co., of Philadelphia, to view the modeling in clays of soldiers, sailors, columns, capitals and other ornamental details, preparatory to setting up in staff on the "Avenue of Fame" that will mark with conspicuous embellishment the thirty-third National Encampment and Reunion of the Grand Army of the Republic, which will be held in the City of Brotherly Love, September 6, 7 and 8.

This triumphal avenue will extend from the north side of City Hall to Cherry street and south to Walnut street, thus forming a series of columns standing fifty-nine feet high, an avenue covering eight blocks or squares, through which the G. A. R. will march. Stretching from column to column the national colors will be intertwined with electric lights. The columns number twenty larger and forty lesser lights. The larger columns will measure five feet square at the base, and will be surmounted by an eagle standing upon an orb with outstretched wings. On the die of the pedestal will be engraved the name of a famous battle, with the regimental corps badge of the regiment most conspicuously engaged. Over the crown molding seven feet above the ground will extend right and left the figures of a soldier and sailor, denoting a land and naval engagment. Where it depicts a naval engagement alone this will be shown by the figures of two sailors, as seen in our illustration, and a battle on land by two soldiers. These figures will stand eight feet high, and above them in scroll will appear the legend in Latin, "Dulce et Decorum est pro Patria Mori" (It is sweet to die for one's country). Midway up the shaft will extend a stand of colors containing three flags. The upper part of the shaft will be red, the lower white. A large brass globe will surmount the shaft, and a short distance beneath, where the festooned bunting is caught, a large laurel wreath will hang. The nightly illumination for this will be provided for by 150 electric lights, or 600 lights in all — sufficient to turn night into day. There will be no gloom in Philadelphia encampment week, but all will be bright and gay.

MAKING A CASTING.

Terra Cotta Works of Stephens, Cooper & Co., Philadelphia.

A royal welcome awaits all who attend the coming encampment. No city in the world is more generously hospitable than Philadelphia, and the veterans who march together again through her streets will have good reason to rejoice, for they will find the spirit of patriotism and good cheer kindled anew within them by the warm welcome that will greet them on every hand.

MITSCHKA.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK. No. 19.

—Physical Testing—Structure.—

IN THE LAST ARTICLE we endeavored to show that the term structure, applied to clays, may mean two things. It may mean either the individual mineral constitution of the clay, or the general characteristics imparted to it by its manner of formation, as an instance of which we have cited shale. We have gone into the discussion of the term in both senses. Perhaps the ultra practical brickmaker might consider these topics without bearing upon the business. But, after all, if we are to approach the subject of clays at all, it would seem but proper that we should know their origin, why they are coarse or fine, plastic or lean, why they are at times found to alternate with sand (alluvial clays) or why they sometimes show parallel structures (shales).

Now, in what purely practical ways does mineral and geological structure affect the clays in regard to their commercial value? We will take the time to cite a few of these, since some of our fellow-clayworkers might need to have their minds refreshed, and in order to encourage them to follow us through the somewhat dry discussion of these things. Several of these practical points have already been touched upon In examining a kaolin, and finding it to be of primary origin, we know at once that washing will be necessary, since but few primary kaolins are free from mineral detritus.

—Cracking in Drying.—

In finding a shale bed we are informed immediately that it is apt to be more uniform and fine grained than a clay. Very often the assertion is made that the addition of sand prevents clays from cracking and checking, and yet this may be true or not, depending both upon the structure of the clay and sand. For instance, cases have been known in which two clays contained the same amount of sand, yet one invariably cracked on drying unless handled with the greatest care, while the other did not show the difficulty.

Seger tells us of a French clay containing quartz sand and carbonate of lime in a very finely divided condition and together with only 16 per cent. of clay substance, it being a material extremely hard to work, very tender in both drying and burning, and which showed the remarkable property of expanding instead of shrinking during the burning, the expansion being equal to 1 per cent. linear dimension. The last named peculiarity was evidently due to the quartz sand present, which expands on being heated. The brick made out of this clay, which were not cracked, could not be considered hard brick, but were durable enough to withstand the mild climate of Havre. The clay was so tender that on burning the brick in a continuous kiln, under ordinary conditions, 90 per cent. came out cracked or checked. Microscopic examination showed that the nonplastic matter consisted of very small, splintery and rounded quartz grains mixed with lime shells and infusorial earth.

At first sight one should think that the lime would tend to consolidate the particles and produce dense brick, it being a powerful flux, but trials showed that the checking and cracking occurred when the brick were heated to a dark red, much lower than the vitrifying heat. Those brick which were heated to incipient vitrifaction without checking at the earlier stage were not affected by sudden cooling. The entire trouble was finally overcome by adding one-fifth of plastic clay.

Dr. Seger tells us of another clay which he examined whose behavior was explained by an examination of its physical structure. The clay in question was very plastic, tough and solid, and, when cut, appeared smooth and without grit. But, although mixed with one-third of sand and handled very carefully, it invariably gave rise to a large percentage of broken and cracked ware. Since this difficulty was obviously due only to physical peculiarities the clay was subjected to a physical examination. It was found to consist of clay substance, together with one-fourth of very fine sand, while coarse sand was lacking entirely, and the trouble in manufacture was evidently due to the behavior of the fine sand. The latter, unlike ordinary sand, when moistened, swelled, showed some slight bonding power, cracked and had a shrinkage of 11.5 per cent., as much as plastic clays. Under the microscope the nonplastic matter was found to consist of very fine dust. The clay, freed from this nonplastic material, warped on drying, but did not crack.

—Peculiar Acting Clays.—

Here we have a case in which sand increased shrinkage to such an extent that it caused cracking, it being composed of extremely fine matter, and, not being able to dry to a solid mass itself, it loosened the cohesive bond of the clay, and thus gave rise to trouble.

Most of us are familiar with one or two cases of this kind. What conclusions can be drawn from them? Evidently not only the total amount of quartz sand and mineral matter in a clay determines the properties of the latter, but also the kind of sand, etc., influences its characteristics. That is to say that the fineness of grain and physical structure of the nonplastic matter are of as much importance as the quantity with which the clay substance is diluted.

Clay Model of a Typical Man-O'War's Man. Stephens, Cooper & Co., Philadelphia.

It is evident that coarse sand must act differently from fine when in a clay, that fine lime pebbles exert an influence different from that of coarser, that fine flakes of mica again impart different properties than sand. The great practical points which are touched by the individual structure of a clay are the "working" of the clay, whether lean or plastic, easy or hard to dry, to water smoke and to burn, and the degree of heat to which it can be subjected, as well as the final wearing power.

It would certainly be more than unnecessary to give examples of the differences in working a clay due to different physical structures, since every clayworker can furnish any number of instances, some of them associated with disagreeable recollections of financial losses. But there might be some doubts raised in regard to the influence of structure upon the heat a clay can withstand. It will be no trouble to prove the assertion made by referring to the manufacturers of high-class fire clay goods, with whom it is a well-known fact that coarse sand decreases the refractoriness less than fine.

—How to Test Clays.—

But how are we to examine clays for structure? By what process can we determine the size of the different grains composing the clay? In answer to this question we have but to turn to the agricultural chemists for information. In the mechanical analysis of soils it has been found necessary to separate the samples with graduations of different fineness by means of a washing process, in order to determine the behavior of different soils. This has also been applied to clays.

Several methods have been devised based upon two principles—one, represented by Schoene, depends upon elutriation, that is, really upon the carrying power of water; the second, represented by Whitney, upon sedimentation. In making the mechanical analysis by either of these methods the clay is graded into materials varying in fineness from the gravel to the clay substance.

A Clay Model of a Soldier of the Civil War. Stephens, Cooper & Co., Philadelphia.

For instance, the following divisions may be adopted: Gravel, coarse sand, fine sand, silt and clay substance. In the Schoene method use is made of the fact that flowing water can carry suspended matter, the size of the particles depending upon the velocity of the stream of water, modified by the shape and specific gravity of the matter. In preparing a sample for analysis in this way it is first put through a sieve analysis—that is, made up into a slip, which is run through a series of sieves, usually ending with 150 mesh.

The remaining portion of the sample is then subjected to the analysis proper. The practical application of the elutriation method consists in allowing a stream of water to flow through a conical, funnel-like tube, with a known velocity which can be regulated at will. Thus, if the sieved sample is put into a vertical tube through which water is flowing upwards, with a low initial velocity first, the finest matter is carried away into a proper receptacle; then, as soon as the water has become clear, the velocity is increased to a higher definite velocity, and, of course, the next largest grade is removed. Knowing the weight of the original sample, and obtaining that of each grade washed off, by decantation and drying, a mechanical analysis of the clay will be the result, expressing the percentages of the different grain sizes in definite numbers and showing the structure of the clay. In this way very valuable and interesting results have been collected.

—Interesting Experiments.—

The consideration and study of these washing processes is extremely interesting, considered both from the standpoint of the clayworker and physicist, but the scope of these papers will not permit an extended description and treatment of the various processes, much as the writer would like to discuss them. However, to any one who has taste for such work, and who, during the less busy season, would like to do some practical experimenting, along these lines, he will be glad to give the necessary information.

In Whitney's process, using the principle of sedimentation in still water, the separation is effected in tall, narrow glasses by letting the water containing the sample stand for different lengths of time. But this analysis is less sharp and accurate than Schoene's, besides requiring for good work the use of a microscope, in order to determine the different gradations of size. The use of the microscope itself may be a valuable help in studying the structure of clays, but its proper manipulation is not a very easy matter.

But the washing processes, as well as the use of the microscope, are in most cases beyond the scope of the average practical man, since they require for best results a good understanding of the physical principles involved and a certain experimental skill, and again because they are tedious in their application. A more rapid method of mechanical analysis would be a boon to the worker in clays. For most practical cases, however, the rational analysis, which has been described in a previous number, together with a simple sieve analysis, will give the desired information in regard to the structure of clays.

The sieve analysis is extremely simple, and might, perhaps, proceed as follows: A sample of clay is dried, rubbed (not pulverized) with a rubber tipped pestle until the aggregations of clay have been separated, and a portion is weighed out for the test. It is then placed into a beaker of water, stirred to form a slip and then poured through a twenty-mesh sieve. After washing the residue remaining on this seive thoroughly the slip is run through, say 40, 60, 80, 100, 120 and 150-mesh sieves. Each size must, of course, be averaged and calculated in per cent. of the whole. In this way a rough graduation is effected, and in connection with the chemical, rational analysis it will give sufficient practical information. The writer does not intend to speak derogatorily of the accurate Schoene and other processes of mechanical analysis, but they are too complicated to be used without previous training in experimental work. AMERICUS.

GOOD AND BAD ORNAMENTAL BRICK WORK.

Nothing more clearly marks the line which separates the good from the vulgar artist than the power which the former always retains to use and not abuse his material, or his opportunities for its free use. The good artist in brick values properly the use of molded brick and terra cotta, and uses them whenever he can do so safely and artistically. The bad artist seems, on the other hand, to rejoice in the endless profusion of ornament with which the cheap reproduction of molded forms supplies him; and the consequence is that in some of the fronts of the later Italian churches we are annoyed and disgusted by the endless repetitions of features which would never otherwise have been marked at all. Such are the rich string courses, and eaves, and gable moldings, which are everywhere to be seen, and which ought never to be imitated.—British Brickbuilder.

Written for the **CLAY-WORKER.**

A BRICK FACTORY IN A WOODEN TOWN. No. 15.

L. C. M.

IN MY LAST ARTICLE I spoke of deferring the description of our up-draft kilns in order that I might give a description of our clays, the more fully to set forth the problems we had to solve in constructing a kiln that might meet our requirements. I do not like to repeat myself, but am afraid I shall be forced to do so by certain circumstances for which I am not wholly responsible. Some months ago the editor of The Clay-Worker sent me a few questions from one of his subscribers, asking for information on kiln construction. These questions were answered in the April, 1899, No. of The Clay-Worker, and a drawing showing the plans of our kilns and furnaces accompanied these answers. I have never made any claim for these kilns and furnaces further than that when compared to the old-fashioned scove kiln they are very superior, both from the saving of fuel and the amount of first-class ware produced.

Until within the last few months I had never had the opportunity to compare the up-draft and the down-draft kilns. My experience had been altogether confined to the up-draft, and, while claiming that strictly good burns could be economically made with the up-draft kilns, where properly constructed and managed, yet I could not conscientiously claim them to be superior to all others, when I knew so little about other systems. However, we have just completed a down-draft kiln for burning drain tiles and will also use it for burning bricks. I shall make a careful comparison of the two, and, after giving the down-draft a fair trial of a season's work, I hope to be able to give the readers of The Clay-Worker some interesting figures and comparisons. I am open to conviction, and who knows but I may be converted to the down-draft idea before the snow falls? But, whether I may change my opinions or remain a mossback to the end of my days, there will still be those who will use the up-draft kilns, because they are so much more cheaply constructed and require so little repairs. So I shall proceed to describe our up-draft kilns, and most cheerfully recommend them to those who desire to change from the old scove kiln to something better, but who do not feel able to bear the expense of down-draft or continuous kilns.

Lay off the foundation for a rectangular kiln, the inside width not to be over 16 feet, but the length may be made to suit the capacity desired.

The walls should be 26 inches thick. Decide upon your floor level, and build the walls up 12 inches higher than the floor. Leave a barrow door in one end and a wagon or barrow door in the other, as you may desire. Now space the kiln for three brick benches and arches 12 inches wide. Then, in continuing the wall, leave five holes 8 inches square in the walls, these five holes to correspond to the arches of the kiln. If your bricks are 8 inches long, then 3 bricks for benches and 12 inches for an arch, the distance from center to center of the five holes will be 36 inches. Make the first hole 12 inches from the corner of the kiln, and space the others as directed above. These holes should be lined with fire brick, for they are subjected to an intense heat. All of the heat that may be produced in the furnaces outside must be forced through these small holes, much the same as water is forced through the nozzle of a hose. This, however, is the only place in the kilns which we line with fire brick, and one of ours has been in continuous use for six years, and now shows but little signs of wear. The walls may now be continued to the desired height. I should advise them to be made high enough to set the bricks from 32 to 36 high. Be sure to leave "peep holes" in different parts of the walls, for they are almost indispensable. There should be one row near the top of the walls and another about 4 feet above the floor level. Place them about 6 feet apart longitudinally, and space them so that your view will be between the arches. This will enable you to determine if the heat is being evenly distributed throughout all parts of the kiln. Next comes the arch or crown of the kiln. These kilns may be used very successfully without crown, but it is economy to use crowns. I said it is economy to use crowns on up-draft kilns, but, unless one will do a first-class piece of work on these crowns, they will prove a source of annoyance and loss rather than gain. Methods of supporting and laying these crowns have been so frequently described in The Clay-Worker that I shall not take up the space to do the same now. Be sure that the uprights that form the braces of the kiln are properly set at the bottom and sufficiently rodded at the top to support the weight of the roof. In a 16-foot kiln the crown should have a rise of not over 3½ feet. In building

The Clay Model of the Great Eagle and Orb to Surmount Column. Stephens, Cooper & Co., Philadelphia. Page 95.

the crown there should be left three rows of flues as follows: One in each corner of the kiln and one every space of six feet along the sides. The third row of holes should be along the center of the crown. These flue holes should be 8 inches square. Chimneys about 5 feet tall should now be built over each of the side flues, but none are necessary over the row of center holes. After laying the crown it is well to continue the side walls about 18 inches higher, of course extending them over against the crown to assist in forming a brace to it. The crown should now be covered with bricks laid flat and grouted with a thin cement mortar to protect it against the weather. The end walls must now be extended upwards a few inches higher than the center of the crown, leaving a space of about two inches between these walls and the ends of the crown. It is also necessary to leave a "man hole" in one or both gables for convenience in filling and emptying the kiln. The kiln is now ready for the furnaces, but I shall leave that subject for another paper. And now a few words in review. Don't make the fire holes in the kiln walls over 8 inches square, for in these small holes lies the safety of your arch bricks, if they are inclined to check and break. Besides, these small holes will enable you to throw the heat toward the center of the kiln with greater force than can be done with a larger hole. It acts much on the principle of a nozzle, as I stated before.

Use common mud for all mortar excepting for the outside course of bricks.

Railroad rails make the best braces we have ever secured. Ours were old rails, and cost but a small sum. We use very strong rods across the top, and do not let one pass too near the flue holes or it will get burned and injured by the fire. Pave the bottom of the kiln with bricks. All such improvements pay well for the trouble and expense. Be sure to have it well drained, and keep the drains open, not only all season, but during the winter as well. Any common tinker can build these kilns, but it is well to have employed one good mason, that the walls may be kept straight and plumb.

Written for the CLAY-WORKER.

CLAY IN VIRGINIA—BRICK IN WASHINGTON.

THE CAPITAL CITY has for three or four years past suffered from excessive competition and business drought, and Washingtonians and Virginians alike realized that selling below cost brought no profits. Strange, isn't it?

Anyway, on the first of this year the brickmakers agreed to pool their issues with the Standard Brick Company. The standard or output of each yard was first obtained, and the purchase of such yard was made upon its output of the past three years, and, allowing 20 per cent. advance on the past sales, to thus make an adjustment on the present demand, which I am happy to report as being good, an advance of 10 per cent. net bringing up the scale to the following quotations for delivery in the city of Washington only:

Machine red brick, first quality	$8.50
Machine red brick, second quality	8.25
Machine red brick, third quality	8.00
Arch brick, first quality	7.50
Arch brick, second quality	7.25
Salmon brick, first quality	6.00
Salmon brick, second quality	5.75
Sewer brick, to pass inspection	9.50
Hand-made red brick	9.50
Select hand-made red brick	10.50
Paving brick	10.50

This is the schedule issued over the signature of the president and general manager, T. L. Holbrook. At present this is far below the present prices obtained for other building materials, but, as thin plank needs a light tread, and until the brick men of Washington can reinforce their plank by an under pin or returning prosperity, the president of the Standard Brick Company will stand by his schedule. Nine yards out of the sixteen were and are thus controlled by the company, the seven standing out representing the hand-made yards, who, agreeing to sell at the same price, practically makes fifty cents per thousand more than the pool, as that fifty cents represents the amount paid to the Standard Brick Company in discharge of its current expenses. All are sold through this one channel, and the company makes its collections and pays the brick men on the 15th of each month, thus relieving them of the many responsibilities of incurring bad debts and making the collections. Only responsible men can buy, and, since the building laws of Washington do not permit of any lien on subcontractors, good judgment or discrimination is used in taking orders for shipment. Measuring up indiscriminately I noticed that the brick run generally 4¼x8¾x2, thus preserving a good line for a nine-inch wall when buttered. This undoubtedly makes easy work, and fits in well with the requirements of the architects.

The Watering Trough in "Ole Virginy."

Hand Moulding—A Days Work Done.

W. H. West & Bros. Works—Along the Kiln Line.

At 6 a. m., and in the cool of a delightful morning, I boarded a car for

—Arlington Junction, Va.—

Over on the northwest side, standing thicker than the government fortifications, may be seen clay banks and kilns in plenty, fringed by the dark waters of the Potomac and backed by the granite needle or shaft of Washington.

Entering the sixty-acre lot belonging to W. H. West and brother I was hailed by a voice covered with sand and dust and darkness, but, "as all coons," etc., I just treated his vociferations with the most lordly contempt, and turned the magnetic glass eye upon him, thereby confounding his confusion. Did you ever notice the sense of distaste the colored gentlemen have to being photographed? One would suppose that at some time or another some of their race had been guilty of stealing chickens. This yard was started along in 1884 by J. P. West, and was successfully carried on after his death by his two sons, J. T. and H. P. West, who, three years ago, died within three weeks of one another. The clay bank runs from eight to twenty feet down, and when hauled is served to the hopper and down into the molds of an old Trenton wheel machine, by which they turn out about 40,000 daily. Some six or eight hand gangs scattered through the yard give them 18,000 to 20,000 daily, so that during the season, from March until about Christmas, they get out about 8,000,000 to 10,000,000 assorted, press and fancy.

For their fancy brick one down-draft, semi-muffle kiln, with a capacity of 60,000 to 70,000, stands in the center of the yard, in marked contrast to the three ten and twelve-arch up-draft.

C. E. West superintends the yards, and takes great pride in the layout, teams and men looking ship shape.

Machine men are paid $1.15 to $1.25; molders, $2 to $2.50; laborers, $1.25, and drivers $1.

Taking all things together, Washington feels a wave of prosperity spreading over her brick horizon. On my road back I made my third unsuccessful visit on hearty John Miller, secretary of the Washington Brick and Terra Cotta Company. Through this channel and by token of my card he will recognize a duty attempted, if not done.

W. P. LOCKINGTON.

Written for the CLAY-WORKER.

CHICAGO PAVEMENTS—PAST, PRESENT AND FUTURE

Fourth Paper.

AFTER WRITING our last paper, in which we expressed our opinion that the ill condition of Milwaukee avenue, as described by us, was due to a poor concrete foundation, we called upon City Engineer Wheelock to secure an opinion from him concerning the matter. He stated, in substance, that the traffic on said avenue was greater than upon any other street in the city, and that in his opinion only granite paving blocks were adequate to meet the demands made upon it, while at the same time he admitted that the evidence was that the foundation had given way, and that the pavers themselves showed little wear after being exposed to about five years of such traffic. We dislike to differ with such an eminent authority, but we find ourselves reasoning on this wise: It being admitted that the pavers show little wear under the unfavorable conditions named, it only remains to furnish them with a proper foundation to insure for them a long life, during which they will render a service superior to granite pavers in the following respects: First, in the matter of being less noisy; second, furnishing a better footing for the horse, especially in icy and wet weather. This is particularly true after the surface of granite pavers becomes rounded by wear, which, under the conditions found on this street, would be the case, we venture to say, long years before the brick pavements would cease to afford secure footing for man's best servant, the horse.

How often have we all seen this noble brute struggling and falling, trembling and cruelly beaten, while attempting to draw heavy loads over slippery granite pavements! The writer, at the last exhibition of this sort that came before him, felt that the Society for the Prevention of Cruelty to Animals could do no better work than to spend their energies, in part at least, in securing a more suitable footing at certain car track intersections for this faithful beast of burden.

What can be said for the granite block pavement is that when it becomes rutted and pitted, it can be quickly and cheaply renewed or relaid, but we submit that it is vastly better to provide a pavement that will hold good and give an uninterrupted service for a term of years without lapses into an ill condition and the requirement of relaying.

But to our argument, which is not yet finished. Probably as heavy loads, though fewer of them, pass over the pavements of a majority of the business streets of Chicago as pass over Milwaukee avenue, and hence it is reasonable to expect that a piece of paving that will carry a hundred of the heaviest loads without disruption will carry a thousand, since it is called upon to carry but one load over a given spot at any one time. Such constant heavy traffic may reduce the length of life of a pavement from thirty years to ten, but it should, while it lasts, or until the foundations give way or the pavers become worn so nearly through as to crumble, wear without the showing of ruts or sink holes such as are seen on Milwaukee avenue. Hence, to our minds, the condition of that avenue, with pavers little worn, except where insecure foundations have imposed unusual and unreasonable burdens, *furnishes convincing proof that a first-class paving brick, properly laid, will successfully compete with the best granite block pavements under the stress of the heaviest city traffic.* We will not discuss this question further now, but will add that when making our early investigations of Chicago pavement conditions we accepted the opinion of a prominent paving brick authority to the effect that brick pavers ought not to be expected to meet the conditions of the heaviest traffic. We give his own words as taken down at the time: "For heavy warehouse streets, where the loads are large and the travel somewhat continuous, I recommend large granite blocks, and I doubt very much whether it would be policy to put in any brick pavements on that class of streets. I doubt whether brick would last as long or be as strong as granite blocks; but they have this advantage over stone or granite—they will not wear smooth or become slippery." Since listening to this opinion we have examined pavements in various Indiana and Ohio cities. Had we not gone outside of Chicago we should have, from what presented itself to us there, have accepted this opinion, but we find that Chicago pavements, while good, do not represent *the best.* After making these extended investigations we returned to Chicago to re-examine Milwaukee and other avenues in the light of our outside experiences. We are glad that we did not say our last word about the pavements before making the trip referred to, as our viewes were considerably modified by the wider outlook. In later papers we may present the facts which have served to change our views, and further discuss the question of brick vs. stone for the heaviest traffic.

53rd Street west from Lake Avenue.

It seems necessary in this connection to say a further word concerning concrete foundations.

In an earlier paper of this series we are on record as saying that in our view of the case natural cements might be successfully employed in concrete foundations for brick pavements in lieu of Portland, and now we find ourselves confronted with apparent failure of foundations in which Portland was employed.

The specifications concerning the laying of brick pavements in Chicago demand the use of Portland cements for this purpose, and prescribe the tests to which they shall be subjected, and, as is usual in such case, the details of proportion and manipulation are also prescribed. Were these specifications followed the theoretical result would be—estimating the use of the smallest brick allowed (8x2⅝ inches)—the maintenance of about ten tons upon each brick the sixth day from the laying of the concrete. Now, we know that in practice but a small fraction of this weight would be required by any load that would be imposed upon a single brick. This estimate is made, based upon the tensile strength of the concrete body itself, while there should be a further supporting value in the subgrade or foundation upon which it rests, which the specifications say "shall be two feet in thickness of earth or cinder, free from animal or vegetable matter, thoroughly compacted and so prepared as to support the pavement permanently, and so that the pavement shall remain at the original grade for the period of ten years," with a further stipulation that "this clause will not be waived on account of any trenches or holes made in the street prior to the laying of the pavement." We are not able to say that the present specifications were in use five years ago, when Milwaukee avenue was paved, but we are warranted in believing that, were they followed, the pavement of that avenue would be in good condition to-day, notwithstanding the leaving out of the specifications an element which we deem vital to the continued long life and usefulness of a pavement laid on a street subject to the traffic conditions which here prevail, and that element *as a well-applied cement filler.*

Dearborn Street, corner Michigan Street.

We have had before us in these papers, first, pavements laid upon or near the lake shore, in the Hyde Park region, the sandy soil of that section being merely graded and rolled and receiving a top dressing of gravel. On such a pavement, laid of Ottawa block, a traffic such as exists on a semi-business street, has been carried on for fourteen years, with the resulting conditions stated, viz., so satisfactory to-day that it is allowed to remain as it is, when a very light expense, such as would be involved in picking the blocks out of the sand (a sand filler being used), regrading the sandy foundations and relaying of the blocks, and in doing so turning them to present a new face, requiring perhaps the addition of 5 per cent. of new pavers. If this work were done, and a Portland cement filler properly applied, we believe this street would be considered as well paved for the traffic it is called upon to endure as is Wentworth avenue, and that its life might run through the next fifteen or twenty years.

The next step noted is of a pavement laid at a point two miles north, on the same avenue (Lake), laid on the sand, but a double course of brick being used, this pavement, laid seven years ago, being in perfect order, on a resident street. The next advance is from a sand foundation to one of macadam, this stretch of a mile or more in length being in apparent perfect order, as seen on Wentworth avenue, after five or six years of service on a busy retail street. The last step taken brings us to concrete foundations, as Ogden avenue, Milwaukee avenue, etc., the latter being the one unsatisfactory brick pavement in the city, for the reasons given.

While there are numerous examples of these concrete foundation pavements, little need be said of them, as they have already been sufficiently referred. We will, however, mention, for the benefit of visitors to the city who may be interested, a short stretch on Michigan avenue, between Van Buren and Jackson, laid as a

—Matter of Experiment,—

As we may suppose, some five years ago, and of which a photo is presented. The wear at this point is mainly from pleasure vehicles, but is quite constant. Its five years of service has left it in excellent order.

One of the prettiest pieces of paving in the city, about a mile in length, may be seen on Fifty-third street, from Lake avenue to near Drexel boulevard. The street is one of good residences. It has been laid out five years, and is as perfect as though laid yesterday. The pavers are of Canton manufacture. The accompanying photo will convey a fair impression of this street.

One other street of this class we will mention as near the center. It may be found on Dearborn avenue, a continuation on the north side of what is well known as Dearborn street. This pavement commences at Michigan street, and for a block or two is subject to the heavy traffic of a commercial and warehouse district. We give a view of it at this point, the county buildings appearing on the left. This pavement has had about five years of service, and we have been particular to mention no pavements that have not had at least the test of this number of years. Five to ten dollars might perhaps be spent on the several blocks which this stretch of pavement covers in putting it in "apple-pie order," any wear being confined to street-car intersections, where very likely some change of track has disrupted or displaced a few brick or exposed them to special hardship, the pavement as a whole being in good order. At the northern extremity of this piece of pavement it meets an asphalt section, a good resident section having been reached.

Michigan Avenue between Jackson and VanBuren Street.

We have several times during our investigation of the paving question in this city had occasion to notice that whenever

—Brick and Asphalt—

Are found abutting each other the asphalt has parted company for the space of two to three feet, and that the wear of traffic is being borne by the concrete foundations, while the brick stand up sturdily to the extra pounding which such conditions throw upon them. Where this condition does not prevail there is the evidence of a recent patching or renewing of the asphalt. This same condition was very noticeable at the intersection of Ogden and Ashland avenues. At the point on Dearborn avenue under discussion, and near the point of intersection, there were numerous broken sections of the asphalt facing, from one to four and five feet in length and of varying depths, laying bare the concrete foundations in places. This is at a point where the heavy traffic has largely ceased, and it may be noted that the asphalt was laid about a year later than the brick.

It is the occurrence of such contrasts in the enduring qualities of the two pavements that is to convince the taxpayers of this country of the great superiority of brick, and it seems to us that only the ten-year guarantee, which brick and asphalt paving contractors are alike required to furnish, serves to give asphalt any present showing as a competitor of brick.

When these ten-year guarantees begin to expire, and the city stands face to face with the need of a complete renewal of the asphalt surfacing (all above the concrete), we believe new asphalt pavements will be laid only in strictly fine residence districts, where the taxpayers are willing to pay a very large premium for appearance as against utility.

In the meantime the method of laying brick pavements is so sure to be improved upon as against anything we have yet seen in Chicago that the number of wheels will be no more apparent on a brick-laid than upon an asphalt street, and hence this prime objection to brick for residence districts will have been overcome. In making this prediction we are only assuming that Chicago will employ methods which have already been introduced in other places, securing such results which will be referred to in subsequent papers.

Before leaving this matter of asphalt pavements we may be allowed to refer to that section of Jackson boulevard lying between Michigan avenue and the river, which was paved with asphalt less than two years ago, in order to convert it into a pleasure drive for the west siders. Along the line of the boulevard at frequent intervals we find signs bearing the legend:

TRAFFIC WAGONS ARE NOT PERMITTED
ON JACKSON STREET.

Unfortunately for Jackson street it is intersected by busy commercial streets, and at the intersections the interdiction of traffic can be of no avail, and all that can be said of the boulevard as a whole is that it looks very nicely for a brief period following a patching.

We were informed by so good an authority as the city engineer, in April last, that some of these intersections had been practically twice renewed in the little more than a year and a half that had elapsed since the pavement was laid. Public attention is being called to the perishable nature of asphalt pavements by the most prominent of the daily press of the city. On May 16 the Times-Herald, in an editorial, discoursed upon them as follows, under the caption,

—Crumbling Asphalt Pavements.—

"Examples of perforated asphalt pavements may be found in almost any neighborhood where asphalt pavements have been laid. * * * There are ruts upon West Madison street, which are the effect of heavy traffic. The causes of the break may differ, the responsibility may not always be the same, but there is always the same consequence—an opening that must be closed unless the ruin is to spread. The future of asphalt pavements in Chicago depends upon the immediate patching of these asphalt chasms. The contractors should be made to feel this while they are held under their guarantees, but it is their disposition to look around for excuses, etc. The people are entitled to a thoroughly sound pavement during the term of the guarantee, instead of a piece of patchwork which will crumble away as soon as the time has expired. Nor is this antagonistic to the best interests of the contractors. In this contention they are probably the greatest losers by defective pavements, for it is certain that their territory would have been enormously increased if their work had been better done and the pavements had been better cared for," etc.

We find the editorial critic making the mistake of charging upon the contractors that which is due to the perishable nature of the materials, for, so far as we have noticed, the work has been done by the leading companies, as the Barber and the Bermudez, and we may presume has been well done.

The editorial closes as follows: This (the failure to keep in repair) is one of the consequences of the short guarantee (ten years), *and probably there will never be a satisfactory reform until the term is lengthened.*"

The underscoring is our own. We are of the opinion that even the present requirement, which, so far as we know, is largely in excess of the usual demand for guarantee, is quite sufficient to rule the asphalt contractors out as contestants for a very large portion of the work of the city, and that, so long as the present requirements exist, competition from this quarter will be less felt year by year.

We have devoted some space to asphalt only as it has seemed necessary in attempting to determine the future of brick in this city. We have needed to take in view the various elements which enter into the problem. Asphalt had a fair start in the race; indeed, it had a decided advantage at the start. It was in favor with the authorities, and it had an attractive face. Its lack of staying qualities alone prevent it holding a foremost place. Granite is not likely to more than hold its own place, which is a restricted one. Brick alone has the qualities needed to check its extension. Macadam, where a sandy bed can be had, and cedar blocks, where a mucky soil exists, will long hold a prominent place as the pioneer pavements, to be gradually replaced by the clay brick or block, which will some day, we believe, in the natural course of events—that is, on their merits—constitute at least three-fourths of the mileage of our great central city's pavements.

E. G. DURANT.

Written for the CLAY-WORKER.

BUTTON-HOLE TALKS.

"WELL, I see you got your picture in The Clay-Worker again. Been masquerading, passing yourself off for an Indian, and a squaw Indian at that; yes, and a curly-headed squaw Indian, too, as 'I Smoke' has said."

"It's a pretty tough thing, take it all together, and I wonder that you had the gall to put it in. What's that? You didn't put it in? Your friends put it in? Now, look here, Gates, be reasonable, and don't talk that way to me. Any one that would get up that thing and print it is no friend to you. Say your enemy did it and it will look more sensible, but don't pretend to tell me that any friend of yours would shave you, and fix you up for a curly-headed squaw, and stick feathers in your hair and blanket you and print the whole wretched affair, and still be a friend to you.

"I noticed he labeled it 'Executed in Terra Cotta.' Since when did they begin inflicting the death penalty in that peaceful valley? Not but that they would be justified in killing 'her' wherever found, but I had supposed that you only robbed people there, and never went to further extremes.

"The idea, though, of tacking that picture onto the little story—What! You just wrote the story for your little girl, and then, as she liked it, you thought you would try it on the others? Well, that's all right, but what I object to is your tacking the picture on. The story wasn't so bad, after all, but I don't like frightening the little dears with such pictures. That's where I draw the line.

"Then, too, the thing mentions your company. Say, you just wait till your board of directors get hold of you! I just heard two of them talking in the hall there, and one of them was saying, 'We may have perpetrated some pretty tough stuff, but we never were guilty of anything like that Indian thing.'

"Then see where you are left with Purington and 'I Smoke' and all the other fellows who haven't rushed into print, but who are laughing all the same, and all those other fellows who have just got their guns and will wait for you. Purington—why he almost went into poetry again over it—talks about Pocahontas, Alfaretta, Minnehaha—there is a good deal of the ha ha—and then goes into multiplication and gets whole flocks of Indians and age and wrinkles over it.

"No, Gates, that's one way you can know a friend from an enemy and an enemy from a friend. Don't make any more such mistakes, but, when you find a fellow you have classed as a friend pasting you as a squaw, why just paste him, and put him down in the list with the enemies, where he belongs. In the meantime buy Purington a Manhattan and send 'I Smoke' a torch, keep away from the fellows with guns, and try to live it down as to the other fellows."

GATES.

Written for the CLAY-WORKER.

PAVING BRICK IN ST. LOUIS.

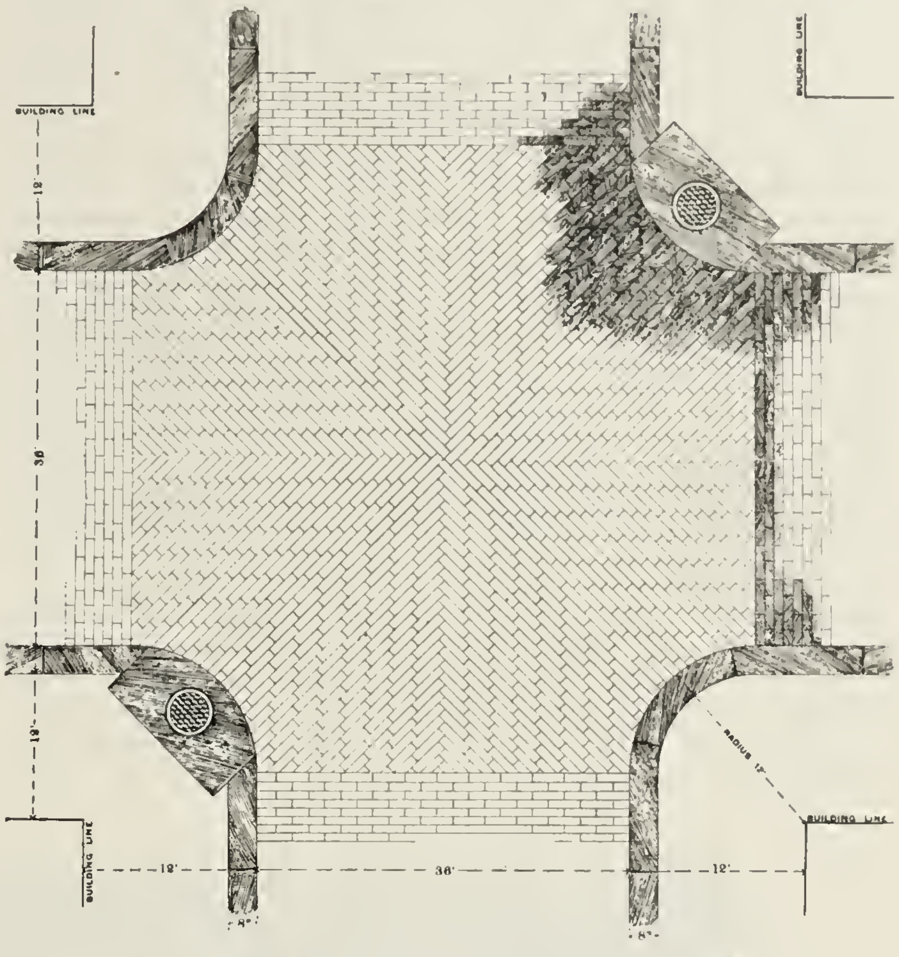
AS THE CITY OF ST. LOUIS is built on a tough, compact, gray limestone, and this was naturally first used for paving the streets. Many quarries were opened within the city limits, which furnished dimension stone for building and curbing, while the refuse was broken by hand into macadam for street paving. Blocks were also made from the limestone for paving the down-town streets and alleys with the Belgian pavement.

Under very light traffic the limestone is fairly durable, but for the average St. Louis street it was found to be too soft, as it soon grinds and wears into a fine powder, which makes a very annoying dust in the dry weather, and a very sloppy, thin, gruel-like mud in wet weather. Yet for years the city tolerated these wretched, dusty or muddy pavements, in spite of the heavy expense of constantly hauling on fresh macadam, to only scrape it off again in six months or less as mud. On one street it was estimated that the amount of limestone macadam dumped on it would have covered the second stories of the houses, as it would have accumulated to a depth of twenty-two feet had it not been constantly removed as dust and mud. Though a dressing of flint gravel has since been used on the top of the macadam, this only gives it a moderate increase in life, so that while the first cost of macadam has been low, the cleaning expenses, as it can only be cleaned by a hand gang, are very great, while the cost of repairs and renewals is very heavy. The limestone blocks were finally delegated to paving alleys only, and they are unsatisfactory for even this light traffic, on account of the roughness of the surface and the consequent difficulty in cleaning.

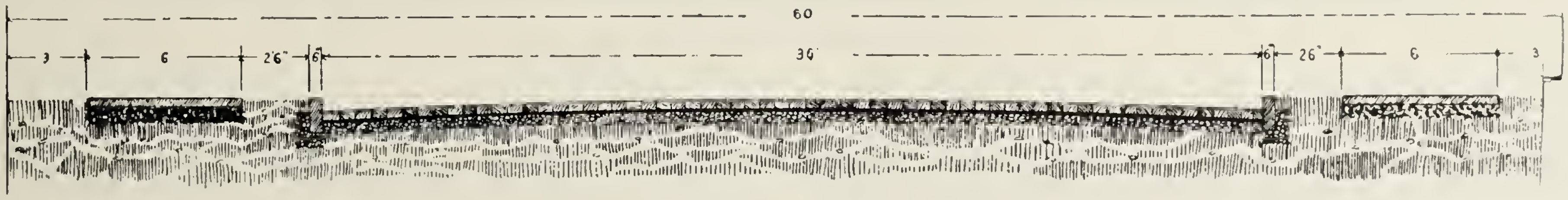
About twenty years ago granite began to be introduced in the down-town section, thanks to an able street commissioner who had the courage to make the taxpayers pay for a good thing, even if they did squeal and make ugly insinuations and even open charges of his having been bought up by the "granite ring." But the granite is so expensive (about $40 to $45 per square, as against $6 to $14 for limestone)that it has only been used in the heart of the down-town section, and less than fifty-eight miles have been laid. Wooden blocks were given a most generous and prolonged trial, as all kinds of local woods were used, and all of the methods of preserving the wood were tried, as creosoting, burnetizing, etc., but the results were all so unsatisfactory that the city recognized some time ago that it was useless to continue its use, after having laid quite a heavy mileage under light and heavy traffic.

Asphalt was tried about 1883, but it cost over $32 per square, and has been found to require constant repairs at a marked expense, so only a moderate mileage has been laid with it, or less than eleven miles, in spite of its cleanliness and easy traction.

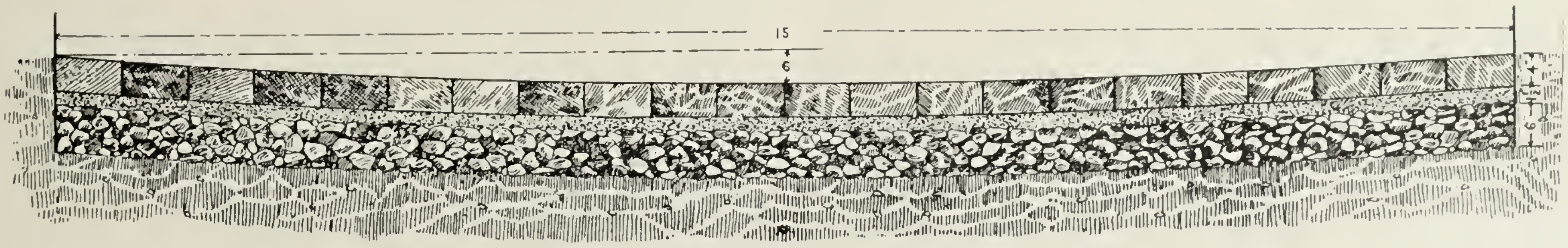
Paving brick was first tried in St. Louis about 1880, but the early experiments were doomed to failure. For of three different kinds of brick that were tried under very heavy traffic, one brick was a common building brick which had been soaked in tar, under the impression that it was frost that disintegrated and demoralized the brick. It was, of course, too soft, and quickly wore out. Another brick was made from a complex, salt-glazed, sewer-pipe mixture of clays, and, as only the surface or skin was hard and vitrified, its life was short. The third brick was an inferior fire brick that was burned too soft to have any durability. While these experiments were discouraging, yet the good surface and low cost as compared with granite tempted one party to continue experimenting with fire clay until he finally got a very fair paver that had excellent wearing ability when they were burned hard enough. But this party lacked the means, experience and capital to make his brick a financial success, so that St. Louis did not become an active user of paving brick until 1895, or until vitrified shale brick had been made a success.



Plan of Intersection Vitrified Brick Street, 60 feet wide.



Street Construction for Brick in St. Louis.



Alley Construction with Brick in St. Louis.

The unfortunate failure of the first efforts in the use of paving brick, at a time when there was not a paving brick manufacturer in the United States, left a bad name that made it very difficult to reintroduce paving brick in St. Louis, as it was taken advantage of by the contractors of other paving material in frightening the taxpayers, who in St. Louis have to pay for the first cost of the pavement. But the satisfactory, substantial experience of other cities, when the brick were used and laid under proper safeguards, compelled the city fathers to again consider them, especially as they make a high-grade pavement at a very moderate cost.

The year 1895 saw three and one-half miles of paving brick laid as the initial movement on residence streets and alleys, which had increased to over twenty-five miles by 1898, with a large prospective business in sight for this year. Since the taxpayers have become educated to the advantages of vitrified paving brick by personal observation, they are now convinced that it comes nearer to presenting more advantages at less cost than any other pavement thus far introduced in St. Louis, and it is now being or is about to be very largely used on the alleys and residence streets, and the St. Louis market is likely to become one of the largest markets in the country for high-grade pavers. For high requirements have been specified from the first, and the city established a testing laboratory for testing the brick as soon as it decided on their use. Thus far none of the Missouri brick that are at present offered in the St. Louis market can meet the severity of the specifications, so that the brick have been shipped in from Illinois, Indiana and Ohio. This has added an excessive freight to their cost, so that the paving brick laid on a six-inch concrete foundation have cost from $14 to $18 per square, or 100 square feet. St. Louis requires a modulus of rupture or cross-breaking strength of not less than 2,500 pounds per square inch, which is decidedly high, and the rattler loss in a standard rattler of twenty-eight inches diameter, revolved at thirty revolutions per minute for one hour, or a total of 1,800 revolutions, shall not exceed 30 per cent. of the original weight. The brick are tested by themselves in the rattler, with no fillers or iron blocks, and the average of two tests is taken.

Both the brick and block sizes are permitted, but most of the work has been laid with brick. The brick are cushioned with a two-inch layer of sand on top of a six-inch concrete foundation, and a cement filler is usually employed. The brick have been found especially desirable for alleys, as they present a smooth, even, nonabsorptive surface that is easily kept clean, so that the limestone blocks are rapidly being abandoned and torn up in their favor. Thus far St. Louis has not attempted to use brick on its down-town streets, like Chicago has on La Salle and Dearborn streets, but with the best grades of brick there would be a great advantage in using them, from the less noise, greater cleanliness and easier traction than the present granite blocks; for while they would not last as long as granite, their very much lower first cost and the saving of interest would well repay their being renewed every ten or twenty years, rather than submit to the rumble and roar of the rough granite.

H. A. WHEELER.

A St. Louis Brick Paved Street, Maryland Avenue.

Written for the CLAY-WORKER.

OUT-OF-SIGHT BRICK: THE CITY UNDER GROUND.

THERE IS ONE USE to which brick are put that is not apparent to the observer in a progressive city. And this is so from the fact that this indispensable product of the clayworker, in this particular, is not in sight. Yet, under ground, not so far from the surface, lie millions of brick, in some cases put there many decades ago. I am speaking of the sewer system of any city that is conducted on sanitary principles.

In this matter I desire at present to direct attention to the capital city, Washington, where for nearly a hundred years improvements in its sewer system have been going on as the growth of the city demanded, and where the brickmaker has found considerable and profitable market for his material. An evidence of this progress in matters sanitary is seen at present in a huge brick sewer being built along the west front of the Capitol, extending through the beautiful grounds and to near the eastern branch of the Potomac river. This sewer is very large, being over twenty feet in diameter, and will require, at a rough estimate, between 2,000,000 and 3,000,000 brick.

But this "little" extension of brick and mortar under ground work (through which a two-horse wagon could be easily driven) is but a fraction of the great sewer system of Washington. The city has a total length of sewers amounting to 2,021,324 feet (382.83 miles), of which 443,109 feet (83.92 miles) are main (brick) sewers, the balance being pipe. Yet, with all this quantity of brick and iron employed, at a cost of many millions of dollars, the city's sewer system is far from being perfect. But work is progressing (if slowly) towards this much to be desired condition, and in about twenty-five years from the present time Washington will be (or should be), from a sanitary standpoint, the place where the germ and microbe are terrors unknown, and where people should die only from old age or accident, or find the fountain of perpetual youth. When this state of sanitary perfection has been obtained between $4,000,000 and $5,000,000 will have been added to those millions already put under ground, which, for the good work they have done, can well be called "buried treasure," a treasure that will never be dug up. And, while the work of improvement is going on, the brick machine will be turning out its product to meet demands.

Up to 1871 the sewer system of Washington did not amount to much. The whole length of the ducts in use prior to this date hardly exceeded fifteen miles, the greater proportion being in short parallel sections, situated near the center of the city, west and northwest of the Treasury Department. The sewage from these flowed into the Washington canal, the construction of which was authorized by act of Congress in 1802, and which extended from the Potomac river, at the foot of Seventeenth street west to the Anacostia river, at the foot of Second street east.

After the introduction into the city of the Potomac water supply (beginning in 1859) the people began to complain of the filthiness of the canal, but it was not until some years later, between 1871 and 1880, that that old waterway and sewage receiver was filled up. Then the sewer connections were made with Tiber and B street sewers, emptying respectively into the Potomac and Anacostia rivers.

To get an idea of Washington's underground world one must refer to an engineer's map. And here, of course, will been the usual network of sewers, conduits, small pipe, etc. But there is a peculiarity about the sewer system of the capital city which is found in few others, and this consists in the fact that there are a number of natural water courses flowing beneath the city's asphalt, streams which have long ago, by the aid of brick and mortar, been converted into conductors of filth and preservers of health. There are nine of these water courses. Tiber creek, which runs from the city's farthest northern extremity to near the Capitol, being the largest. This system has eight branches, making, with the other streamlets, seventeen minature rivers that flow on in darkness, unknown to the thousands that walk the streets overhead.

For many years the Tiber flowed open to public sight, bridged in various places by brick culverts, and its arching over was slowly completed as time passed on. That such a city cleansing force should be left unutilized for so long does not speak well for the old-time legislator, who seems to have had little care for sanitary conditions, and this is also attested in the fact that the first appropriation by Congress for Washington's sewers was the big sum of $120. This was for "erecting an arch on the south side of Pennsylvania avenue, between Ninth and Tenth streets." This was in 1810, when, and for several decades after, the streets of the capital were little better than bogs.

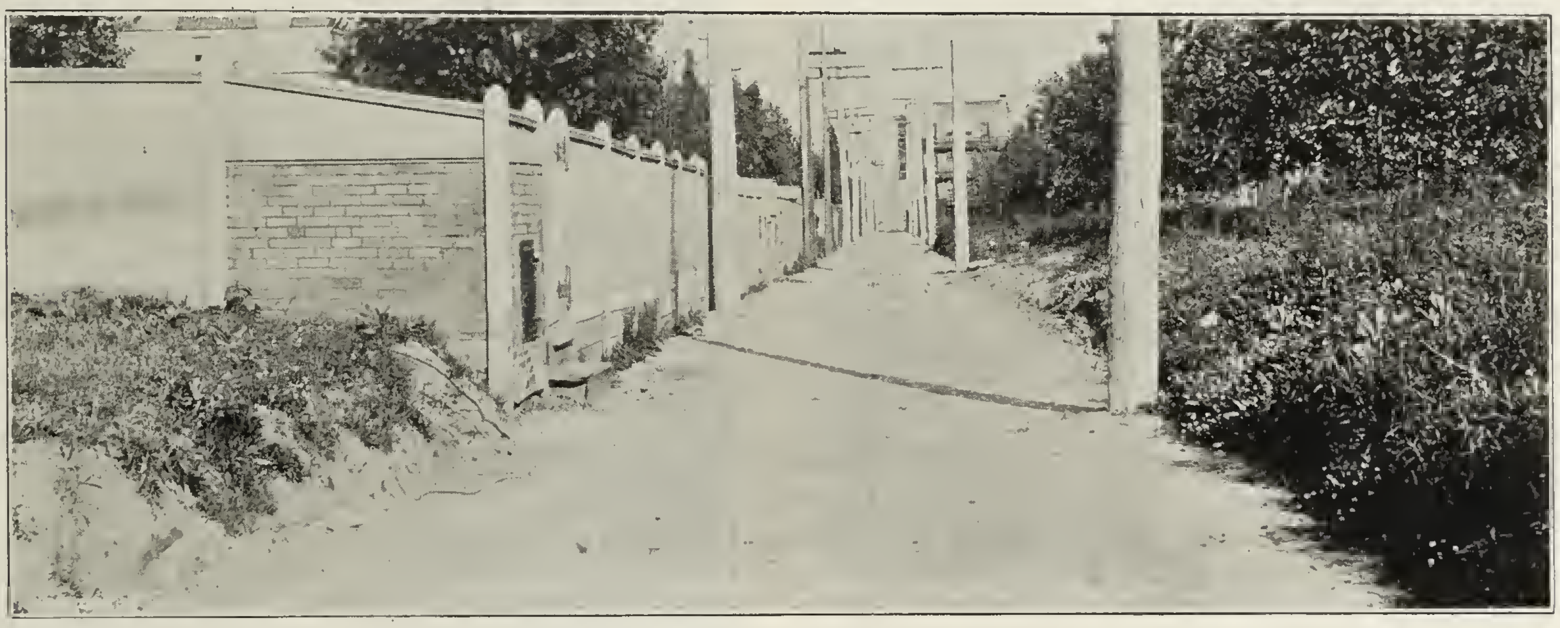
So for eighty-nine years the Washington brickmakers' product, in part, has been utilized in building carriers for the city's sewage, which all this time has been polluting the Potomac river along the southern city front, and only recently have plans for doing away with this unhealthy manner of disposing of filth been considered.

In carrying out the new plans for the disposition of Washington's sewage it is possible that pumping stations will be erected and pipe lines used to convey all foul matter some distance down the river, where it will be deposited in tide water, to be drifted on to Chesapeake Bay. This improvement, and some others in connection with the city's sewers, no doubt will give to the nation's capital an excellent sanitary system, equal to any, except, perhaps, that of Berlin. In the latter, German ideas in economy and healthful conditions have given to the world an example that could be followed with profit.

Until about ten years ago Berlin had emptied its sewage into the Spree, polluting its waters, and, according to German ideas of economy, wasting matter that should be turned into gold. But a new system was arranged whereby the city was divided into twelve drainage districts, called "radial systems," the divisions being arranged upon topographical considerations. The sewers of each district convey to a common center, at which is a receiving basin and pumping works. Some miles distant an immense sewage farm (or farms), comprising about 20,000 acres, was equipped with reservoirs and a pumping station, where the sewage, brought through a tunnel connecting with the city's district sewage centers, is distributed as fertilizing material. Thus the filth is kept out of the river and made profitable. The cost of changing and completing the Berlin sewerage system was nearly $16,000,000.

Of walled canals (sewers) Berlin had in 1888 about 94,567 feet; of sewer earthenware pipe, 1,436,120 feet, and of force pipe about 231,864 feet.

The farms fertilized and irrigated by the system mentioned are also contributed to by the cities of Charlottenberg and Potsdam, forming a part of the general plan by which the land forming the farms is ramified by an intricate network of pipes, without which the utilization of sewage would be impossible. This unique and profitable manner of disposing of its sewage undoubtedly puts Berlin in such matters foremost among cities. But, when it comes to a matter of brick, stone and mortar used for this purpose, Paris must be considered in the front rank.



A St. Louis Brick Paved Alley.

The sewers of Paris! They have long found their place in history and romance. And to me their most impressive association in the latter particular is found in the work of that master of literature, Victor Hugo, and in the splendidly drawn character, Jean Valjean, who toils through the muck of the great sewers, carrying the wounded Marius, to arrive at last on the bank of the Seine, where he is met by his restless pursuer, Javert, of the Paris detective service.

Underneath this gay city, the mistress of fashion and frivolity, lies the clayworkers' product in millions and millions of brick fashioned into cylinders, some huge, some small, all making up an underground world that ramifies the earth in every direction, pouring its polluted tide into the river, and yet constituting a most imperfect sewerage system. The pipes are there (500 miles of them), but the fall is insufficient, making by this defect the continual work of one thousand men necessary.

Down in the loathsome atmosphere, where artificial light must be used, (these egouttiers, sewer cleaners, remove the obstructing filth which the sluggish water cannot carry, for if they do not this, dangerous gases will be forced into the houses when there is a heavy rain or when the sewers are otherwise flushed. Taking care of this department of Paris's public works costs about $800,000 annually, and this, with the cleaning of public ways, makes necessary an annual expenditure of $5,000,000. The largest of the sewer pipes under Paris cost from $60 to $70 per running meter (the meter is 39.37 inches); the medium size, from $40 to $50 per meter, and smallest size, from $15 to $20 per meter. Now, if we put the cost of the largest sewers in Paris, into many of which large boats are taken, at nearly $100,000 a mile, some idea of the vast sum it takes to build a great city's sewerage system can be obtained.

But, though it requires such great amounts of money to obtain sanitary conditions in regard to proper sewerage in cities, there should never be opposition to improvements of this kind. And this is particularly true of cities in hot climates, the people of which, strange to say, seem to give little attention to hygiene. The cities of Havana and Porto Rico have been for centuries stinking pest holes, not for the lack of either money or brick, but of enterprise and a decent regard for the laws of health. But a great change in this respect is being effected in Cuba by the aid of Yankee brains and energy, not a little part of both being represented in Mr. D. E. McComb, superintendent of sewers for the District of Columbia, who is now in Havana assisting in putting that city in a healthful shape by giving it a good sewer system. And here is a good opportunity for some enterprising American brickmakers. There will, of course, be a demand for large quantities of brick to be used in constructing the Havana sewers. This work will be done under American supervision, and there is no reason why the product of an American clayworker should not be used.

Speaking of the filthiness of the harbor at Porto Rico, a sea captain recently said that a ship could not drop anchor there without stirring up a stench that could be smelled miles away. Well, that's a long stretch of fancy or a "very long smell." But, when we consider that the average quantity of sewage matter of a city is estimated at fifty gallons per day for each individual—matter coming from houses, markets, slaughter houses, etc.—or 1,000,000 gallons for every 20,000 inhabitants—365,000,000 gallons a year—it will be easily seen that even a city smaller than Porto Rico could in some hundreds of years, as in the case of that old island town, store up filth enough to cause more evils than ever flew out of Pandora's box.

Now, after having given the above information, for some of which I am indebted to a consular report, let me say a few words about brick and building in Washington. In real estate transfers, from which, indirectly, a great deal of help comes to the brickmaker, there has not, for the past few weeks, been much activity. But still considerable building is going on, in spite of the fact that material is high, and brick are finding purchasers, and, of course, at a good figure.

There will soon be a demand for a large number of red brick for the new United States Census Office, plans for which are in the hands of builders. This structure will be 219 by 335 feet, and will contain some very large working rooms. On the first floor will be the punching room, containing 22,400 square feet of floor space, the tabulating room the same size, and the card room taking up about 15,000 feet. Besides these big working places there will be the schedule room, composing room, proof room, press room, stock room and office rooms. The second floor will have a number of working rooms, lavatories, etc.

Among other bulidings to be erected soon are six in the southeast part of the city. These are to be constructed of brick and brown stone. They will be quite handsome, and will cost $6,000 each. Another enterprise consists in the putting up of fifteen small houses to cost in aggregate $90,000. The prospective work mentioned is but a part of that which will soon be taking the brick man's material.

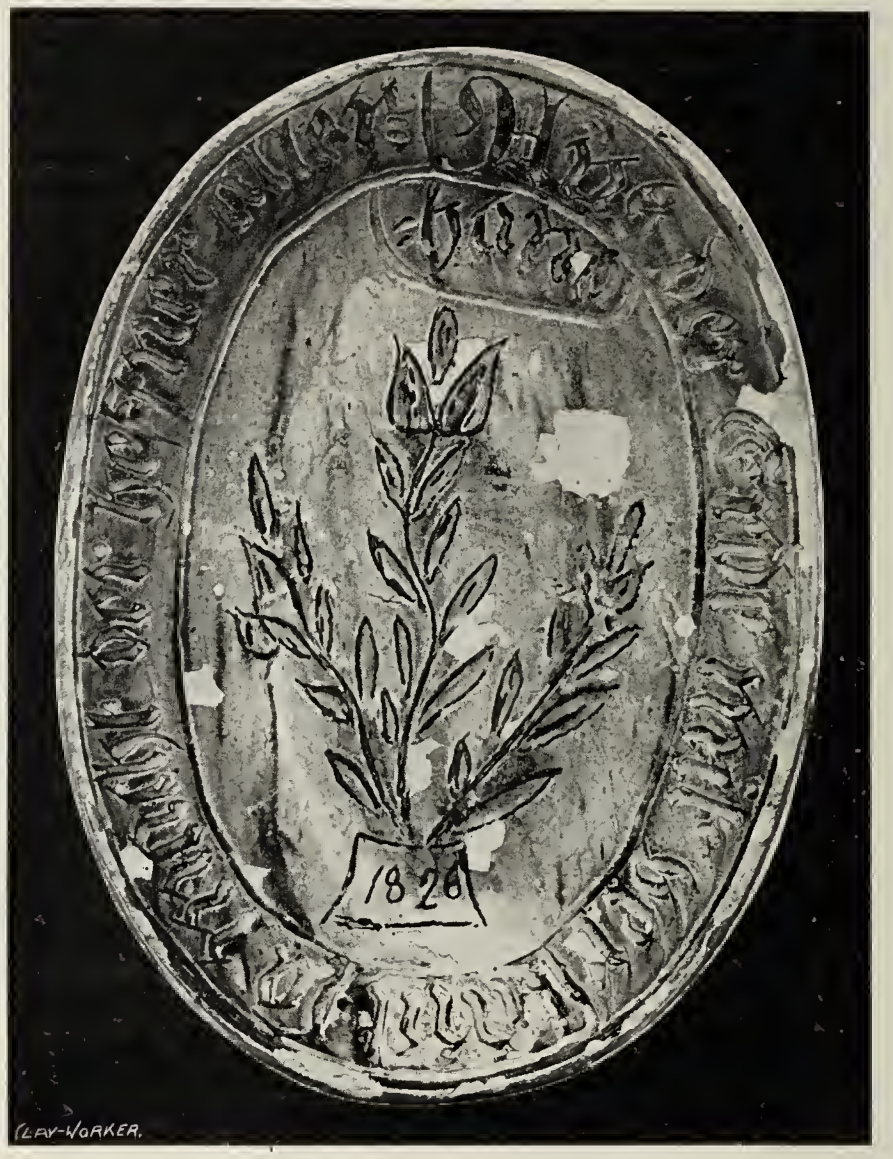
NICODEMUS.

Written for the CLAY-WORKER.

BRICK CLAY POTTERY.

—Old German Tulip Ware in Pennsylvania.—

THE OLD-TIME POTTERS in the German settlements of eastern Pennsylvania made a variety of pottery not found anywhere else in America. As I have shown elsewhere, this ware was manufactured of common red brick clay, decorated with rude designs of flowers, animals, men and women and old German rhymes and frequently dates. Recently some interesting discoveries have been made in this field and numerous antique dishes have come to light, among which are some specimens that collectors consider the most curious and remarkable objects of the ceramic art ever made in this country.

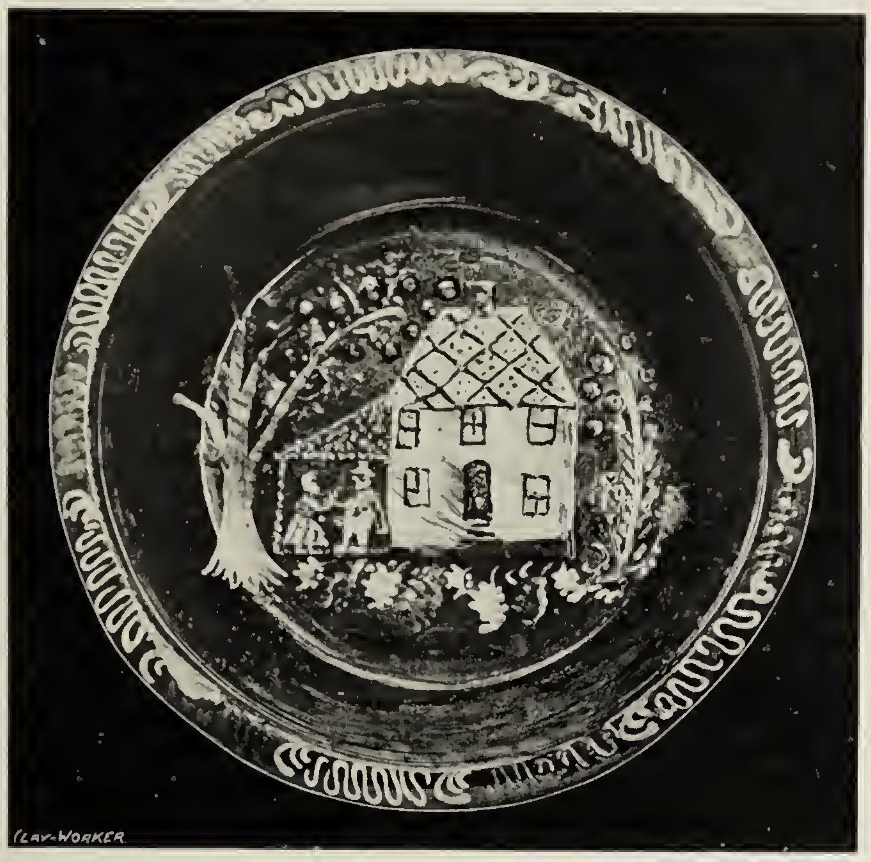


Pie Plate made for Jacob Funck, 1804.

The usual vegetable dish of the old Pennsylvania German was circular in form, with inclined sides and flat bottom, and the larger ones were used as receptacles for meat. The oval shape was rarely employed by these potters and the example here figured is of special interest because it is the only one of this form which has come to light. It was made in the year 1826, as is shown by the date. At that time English china was beginning to be introduced into this section of the United States and this piece shows the first attempt of the old German potter to imitate the shape of the blue china platter. But the innovation does not seem to have met with favor, since the circular dish continued to be used until the old potteries fell into decay, about the middle of the present century. It is curious to note the arrangement of the decoration of this earthenware platter, which indicates that it was placed, when in use on the table, with the narrow side towards the carver, instead of the broad side. In the center is the usual tulip.

while around the margin is boldly etched this inscription:

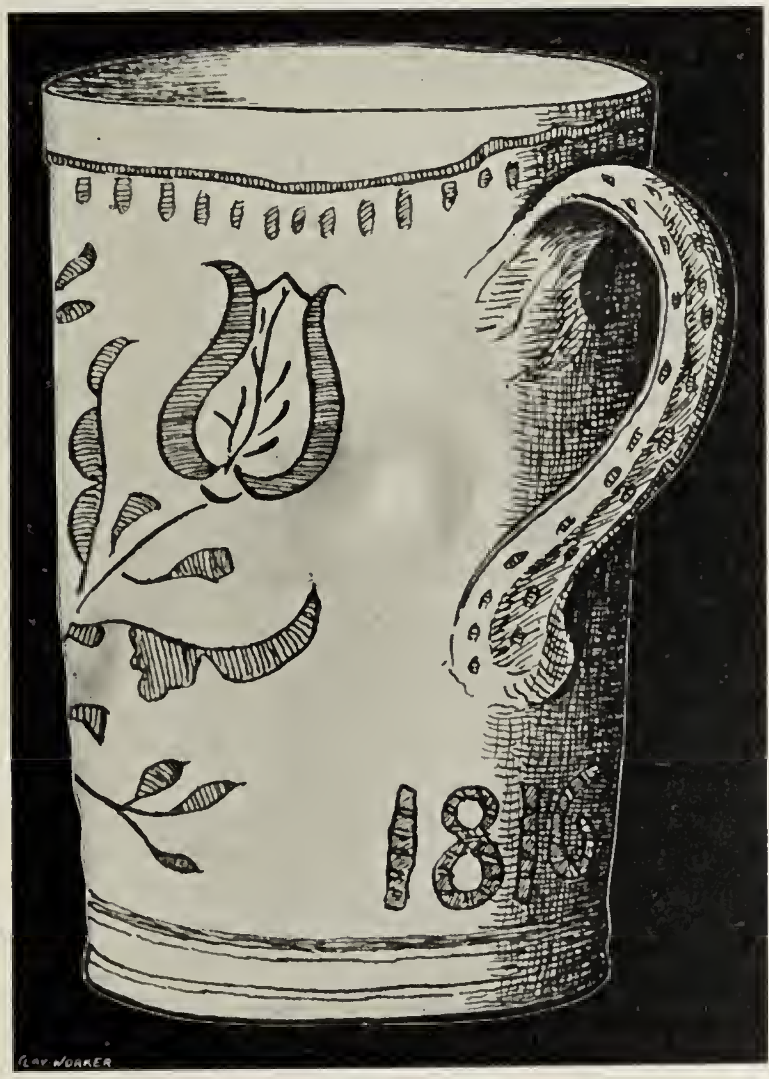
"Aus der Erde mit verstandt
So macht der heffner aller hand"—



Pie Plate made by David Spinner.

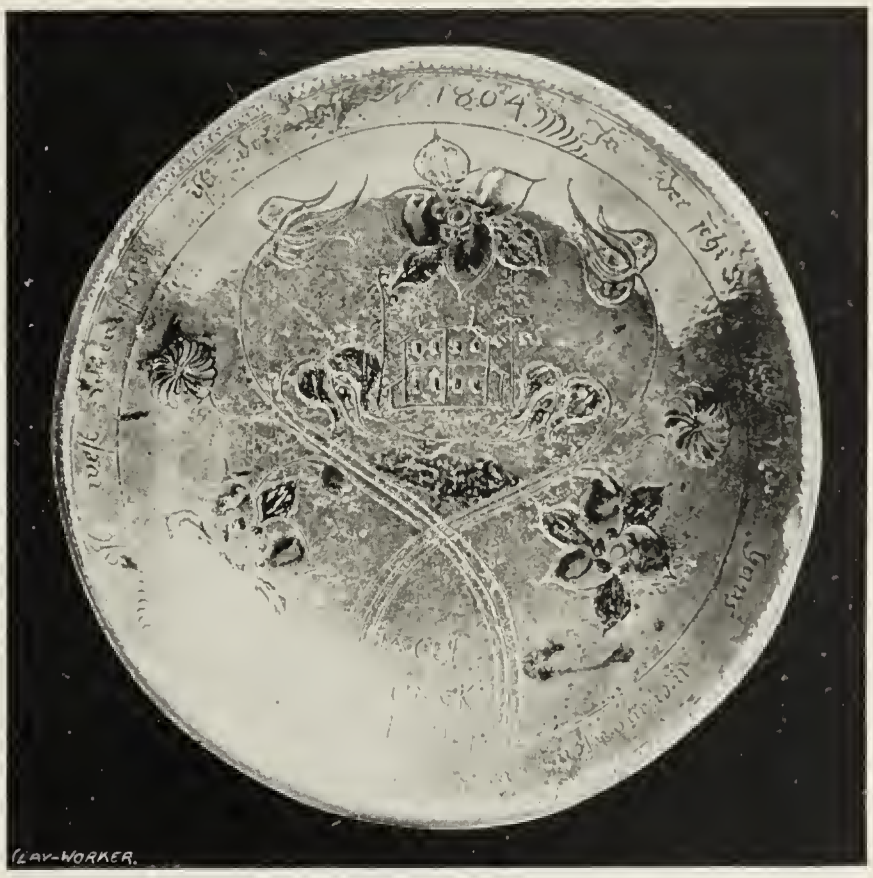
(Out of earth with understanding the potter makes everything.)

Among various kinds of slip-decorated pottery of eastern Pennsylvania is a variety not often met with. The glaze is of a deep, rich brown and the decorations, which have been poured on the surface by means of a tracing quill or "slip-box," are white, green, chocolate and blue. The coloring is entirely different from that of other varieties, and, judging by the similarity of the decoratons of pieces and their rarity, they must have come from the same source, but from where or made by whom we are not yet able to state. Only three pieces of this character, have been discovered, the most interesting being a large, deep vegetable dish with central design of house, with porch, on which stand a man and woman clasping hands. At either side is a tree bearing large apples which are represented by dots of slip standing up from the surface. A similar piece, recently found by the writer, bears the figure of a house in the center and under it is the date 1843, which would seem to fix the approximate age of the three pieces, showing them to be of comparatively recent date.



Pennsylvania German Mug, 1816.

We do not suppose that these people used mugs for beer drinking, but they made mug-shaped utensils which would not look amiss in a collection of modern "steins." These were generally intended for quart measures for measuring out milk, vinegar and other liquids. Sometimes they were ornamented with incised designs in the prevailing style of sgraffits work, when they were, doubtless, put away with the homely bric-a-brac, or, mayhap, used in quaffing home-made beer. The tulip was usually the subject of the incised design and occasionally the date of manufature was added, as in the example here shown.



Slip-Decorated Vegetable Dish, about 1843.

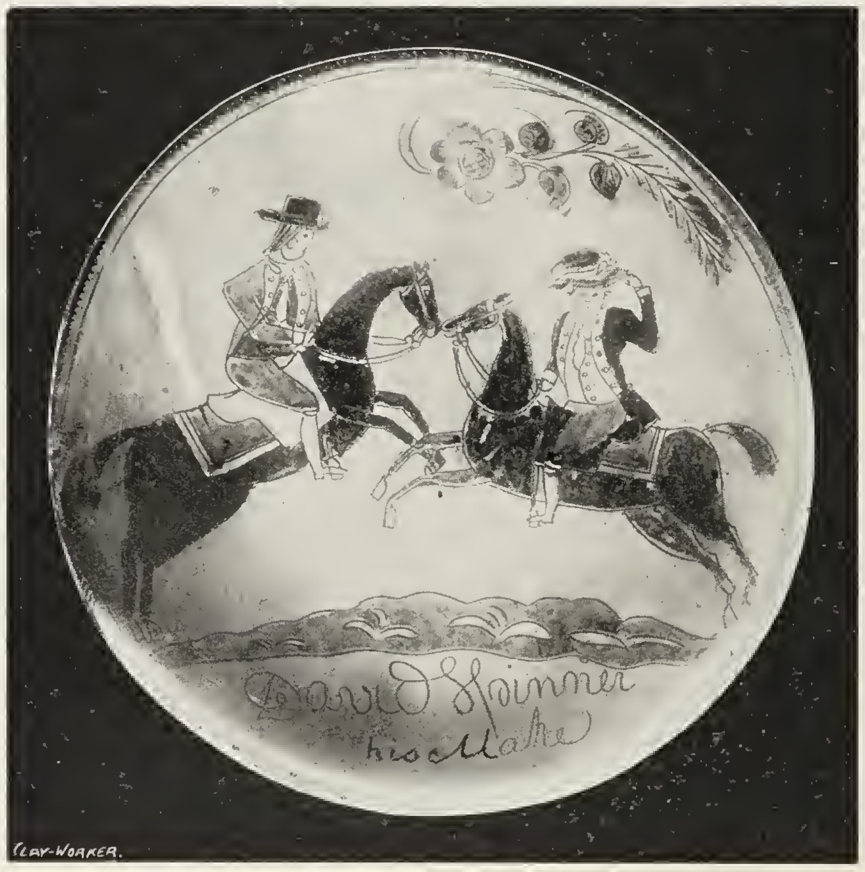
The small potteries where this curious ware was made were quite numerous in several counties of eastern Pennsylvania and were active for more than a hundred years, but as none of the older ones survived the middle of the present century it is almost impossible to locate them now, or to learn the names of their owners. Through the descendants of some of the old potters, however, who are living in the neighborhood, the history of several of the old pot works has been preserved, and perhaps a score of the early potters can be named. From one fully authenticated piece of ware owned by a grandchild other pieces may be identified, by means of the decorative design, the German inscription, or peculiarities of workmanship, glaze or clay. But sometimes we meet with a specimen which bears the name of the maker and by means of such a piece we can, with little difficulty, decide the origin of others. A pie plate of this description carries on its face the name of David Spinner, and the words "his make," immediately below, remove all doubt as to whether he was the person for whom the dish was made or the manufacturer of it, for occasionally the name of the recipient or purchaser of a decorated piece appears on it. The name of the giver, unless he be the maker, never appears, but the name of the givee is sometimes found. It is of importance that this should not be mistaken for the name of the manufacturer. This difference is sometimes difficult to determine without careful investigation; but through the aid of some of the local historians or genealogists we are often able to decide. By way of illustration, let us refer to a pie plate recently acquired by the Pennsylvania Museum and School of Industrial Art, Philadelphia. The central design is a house surrounded by large tulips. Around the margin is an inscription:

"In der schisel seth ein Haus
Wer mausen will der bleib draus
Ost, West,
Mein frau ist der best."

This, liberally translated, means—

"In the dish stands a house—
He who would pilfer should stay out;
East, west, my wife is the best."

At the base is the name Jacob Funck and the date 1804. After carefully investigating this matter, I found that there was one of that name known among the local potters of that period, but there were several persons of the name who lived at the time in Eastern Pennsylvania. The inference is that the plate was made as a presentation piece to one of these persons, in commemoration of a wedding or birth day.



An Earthen Platter, 1826.

In another article I shall describe and figure some of the most curious and interesting pieces of this characteristic pottery that have yet come to light.

EDWIN A. BARBER.

THE SUNSHINE OF BUSINESS.

There is some cause for the skepticism of the semi-occasional advertiser as to the good results of advertising. He has spent money for the publication of business announcements, and has had at the most merely a spurt of appreciable returns therefrom, after which his trade again stagnated. For this reason he is prone to jump at the conclusion that advertising does not make business grow. Naturally, in his case it does not. If the sun should shine only about six times a year nature's great scheme of development would be checked. It is that marvelous and never-ending regularity of the great orb of day which produces the comforts and luxuries of mankind. In like manner persistent advertising stimulates and renders profitable the tradesman's business.—Philadelphia (Pa.) Record.

Written for THE CLAY-WORKER.

THE FIRST SUMMER MEETING OF THE AMERICAN CERAMIC SOCIETY.

IN THE EVENING of July 4 a dozen enthusiastic members of the American Ceramic Society registered at the Hollenden Hotel, Cleveland. Even a casual observer could see that the party was resolved to have a profitable and enjoyable meeting. After the first greetings were over the business on hand, as well as the discussion of pertinent topics, were seriously attacked, and a most successful session was held, lasting until the small hours of the morning. On the morning of the fifth the party made its way to the dock of the Detroit and Cleveland Navigation Company, arriving there at 9:30, in time to board the steamer City of the Straits, bound for Put-in-Bay. The docks are located very near the famous viaduct connecting the center of the city with the west side and in a crowded manufacturing district, which is characteristic of the busy city on the lake. From the hundreds of stacks smoke was pouring forth, the whir of machinery and the noise of steam was heard on every side, giving evidence that the magnificent manufacturing plants of Cleveland are having their share of prosperity. The steamer was towed through the tortuous windings of the odoriferous Cuyahoga river, amid the hoarse signals of the busy tugs and lake steamers.

After the boat had gone down the river some distance, one of the members who had arrived in the city on a train which was belated, after an exciting race, and with the assistance of the tug boat crew succeeded in boarding the steamer and to make his appearance among the ceramic workers. The little incident, though furnishing amusement for quite a lot of spectators, failed to be appreciated by the main actor, since the sun shown mercilessly upon the scene. Soon the open lake was reached, from which the vast extent of the city and the great harbor improvements could be appreciated. It was an ideal day just for such a trip. The broad expanse of the green water of Lake Erie, the delightful lake breeze, the numerous steamers and sailing vessels made it one of beauty and comfort. But the energy of the ceramic passengers would not permit them to give thmeselves up to enjoyment alone. A business meeting was held in a quiet, cool corner, and several important matters were discussed. After a four hours' ride the group of islands, famous since Perry's victory, was reached, and a landing made at Put-in-Bay. A sudden summer shower surprised the party. It, nevertheless, proceeded by street car to explore the island. The natural caves for which Put-in-Bay is noted were first visited. On descending into one of them, the Strontium cave, the party was rewarded for the trouble by a

—Magnificent Sight.—

Beautiful crystals of strontium sulphate of wonderful symmetry, behind which electric lamps give rise to charming color effects, formed the walls and ceiling of the cave. After obtaining some crystals as souvenirs and sampling the grape juice for which the island has a reputation, the party proceeded to Hotel Victory, where the ladies and their escorts had dinner. Other members geologically inclined occupied their time examining the glacial scratches in the limestone rock—a strong evidence of the ice movement which ages ago took place over this rock. Before embarking, this part of the expedition refreshed itself with an impromptu lunch at one of the restaurants along the beach. On the return trip to Cleveland a shower, accompanied by a swift wind, came up, the lowering clouds and white-capped waves affording a fine spectacle to the inland inhabitant. However, the specter of "lake" sickness did not make its appearance. The party, on reaching Cleveland again, repaired to the Hollenden, where, after refreshing the internal man, a business meeting was continued till 2 in the morning.

—A Thirty-Mile Trolly Ride.—

Another bright day smiled upon the members as on the morning of the sixth they boarded a car of the electric line to Akron, a distance of some thirty-six miles. The cars of this company are heavily built and finely equipped, representing the highest present type of electric rapid transit carriages. A high rate of speed is maintained on this road, and the ride through the charming, rolling country was a delightful one. A stop was made at Cuyahoga Falls, a well-kept town, some five miles from Akron, located at the rapids of the Cuyahoga river. The party made its way down to the river, flowing here between high, steep walls of rock. A primitive ferry conveyed the excursionists across to a path meandering amid a picturesque assemblage of rocks and in the shade of trees. some of the members found it exhilarating pastime to leap from rock to rock, in extreme danger of getting wet. But the thoughts of dinner moved the party again to the car line, going to Akron, where dinner was had at the Buchtel Hotel.

—A Great Clay Center.—

Akron, pleasantly located between hills, is a busy manufacturing city, especially prominent in the pottery and sewer pipe lines. Its streets are for the greatest part brick paved, and brick is also prominent as a building material. Of special importance are the extensive rubber and printing works. In the afternoon the representatives of the ceramic society decided to visit some of the potteries, and for this purpose first made their way to the works of the Akron Stoneware Company, in East Akron, where they were most hospitably received by Mr. L. F. Force, superintendent of the factory, and shown through the plant with the greatest courtesy. Stoneware pottery of all kinds is made here, salt and slip glazed. The usual clay preparing machinery is in use, chaser pans for grinding the lumps of clay, blungers, slip pumps, filter presses and upright mixers. The bulk of the ware is made on jollies; for the larger pieces and some special work hand turning is still in vogue. But for the very largest pots a most ingenious machine, perfected by Mr. Force himself, is in use, in which the pot is made in wooden molds and turned up inside by means of a rubber covered roller. This machine is almost human in its action, turning up the pot truer and smoother than it can be done by hand, and the danger of cracking in drying and burning is less, since the walls of the ware are of uniform thickness, which is not always the case in hand work. That the progressive spirit pervades this factory is also shown by the fact that a line of high-grade artistic pottery is being developed. The decoration of this ware is underglaze work, and gave evidence of high artistic skill. The glaze is very satisfactory in regard to technical perfection, and, although Mr. Force has not allowed a single piece to be sold, the ware will be put on the market in the near future.

The next plant visited was the large concern of the Whitmore-Robinson Company, manufacturing both stoneware and yellow ware. Here again a kind welcome was extended the visitors by the superintendent, Mr. Joseph Blackwell. This factory was somewhat of a surprise to the Eastern members representing the New Jersey whiteware district, who, until then, could not disguise just a little feeling of superiority over the Ohio potter, although the representative of the Rockwood pottery was a powerful factor in checking them, and what made things worse was that large quantities of ware were consigned to New Jersey, among which demijohns were not lacking.

—Electricity in Clayworking.—

The plant is complete in every respect. The machinery is the best of its kind, the power plant being almost ideal in its arrangement. Power is applied by a fine, large Corliss engine, but it is to a large part distributed by electricity, motors driving the separate parts of the plant. In this way the power lost in turning long lines of shafting is saved, and the convenience of the plant is greatly increased. A splendid fire service is also maintained. The drying is accomplished exclusively by the radiating heat of the kilns, it being retained by fireproof iron construction walls and roofs. This is an interesting example of fuel economy, a point so often disregarded by American manufacturers. The stoneware manufactured at this factory is equal to the best, and the yellow and Rockingham ware has made for itself a reputation. A walk through the warehouse proved quite interesting, and there were found all kinds of stoneware, from the gallon stoneware jug to the Rebeccah teapot.

But evening had come only too soon, and it was time to return to the hotel. It had been the intention to visit a factory manufacturing chemical stoneware, but this had to be given up.

In the evening a prolonged business session was held till quite late, but no formal papers were read. Mr. Stover, of Trenton, gave a most interesting talk upon the influence of the tariff upon American pottery interests.

—A Great Sewer-Pipe Factory.—

On the morning of the 7th the last feature of the programme was to be carried out—the trip to Barberton, a young but enterprising town. After leaving the Union depot a short ride covered the six miles, and about 9 a. m. found the party at the Barberton station, heartily welcomed by the secretary and manager of the National Sewer-Pipe Company, Mr. E. M. Buel, a perfect type of the polite gentleman. As the first stage of the courteous treatment to be received at the hands of Mr. Buel the visitors were invited to board a special train of the Barberton belt line for a ride to the shale bank of the mammoth sewer-pipe works, one mile distant. Arrived at the bank a huge steam shovel was seen at work, with one and one-half-yard dipper, filling up the clay cars with astonishing rapidity. Back again to the town the party was taken around the little city and shown the various manufacturing establishments—the great match works, the boiler works, which, by the way, were then working on boilers for the Russian navy, and various other concerns. Returning to the sewer-pipe works the members were invited to inspect the plant, a privilege which resulted in a rare treat to the interested clay-workers. It would be a task far beyond the limits of this sketch to do justice to the gigantic concern. Everything is executed on a magnificent scale, starting with the batteries of automatically fed boilers and the two engines of 500 horse power and ending with the fifty-two round down-draft kilns. But this much can be said that its equal has not yet been built, and the high quality of ware turned out certainly shows that the manufacture of sewer-pipe has been reduced to a system. Even the fastidious art potters found something along their line by being shown small specks of "tiger's eye" under the salt glaze, discovered by the ever watchful eye of the secretary. At the elegant brick office of the company a collection of clay curios made by workmen of the factory was shown, and a number of miniature sewer-pipes were given away as souvenirs. Since dinner time was at hand the party boarded an omnibus and was driven to the Barberton Inn, a splendid hostelry, renowed far beyond the limits of this town—in fact, being a favorite stopping place of Akron and Cleveland visitors. Here the hospitality shown by Mr. Buel, in the name of the National Sewer-Pipe Company, almost overwhelmed the visitors when they were invited to sit down to an elegant repast which would have done credit to a high-class hotel of a large city, Mr. Buel doing the honors in the most graceful fashion. The health of the generous hosts was drunk in sparkling liquid and success to them.

After dinner the usual cigar was had, and the ever busy secretary gathered the members for a last business meeting. At last the hour of separation had arrived, and, after thanking Mr. Buel most heartily for the kindness shown them, the members parted in the direction of their respective homes, with the hope of meeting again next winter.

A MEMBER.

OBITUARY.

—William Broadbent, Atlanta, Ga.—

THE SUBJECT of this notice was a member of the National Association of Brickmakers, and, while not a manufacturer of bricks, nevertheless his trade and calling as a machinist and engineer brought him in close touch with the trade and craft of brickmakers.

William Broadbent was born in Halifax, Yorkshire, England, Jan. 1, 1843, and was therefore in his fifty-seventh year of age. He emigrated to America and landed there in July, 1868. Settled soon after in Cincinnati, working there and at Hamilton, O., at his trade as a machinist. Later he moved to Indianapolis, and was seven years in the employe of the Atlas Engine Works.

In October, 1883, the Atlas Engine Company sent him south to erect an engine for the Chattahoochee Brick Company, which they had purchased from the above company. The Chattahoochee Brick Company prevailed upon him to remain with them and take charge of all their engines and machinery, and he remained in charge from that time up to a short time before his death.

Mr. Broadbent was taken sick last January, and at first his case was not considered serious, and from which he apparently recovered. A few weeks later he was again prostrated with la grippe, and this soon developed serious complications, which resulted in Bright's disease and heart trouble. The physicians were never hopeful of his recovery, although he himself was, and was so until the end came.

Mr. Broadbent was the junior member of the firm of R. B. Morrison & Co., and it seems a strange coincidence in the life and death of these two men and fast friends so nearly together. His death occurred at Oakdale, Ga., on July 22, 1899.

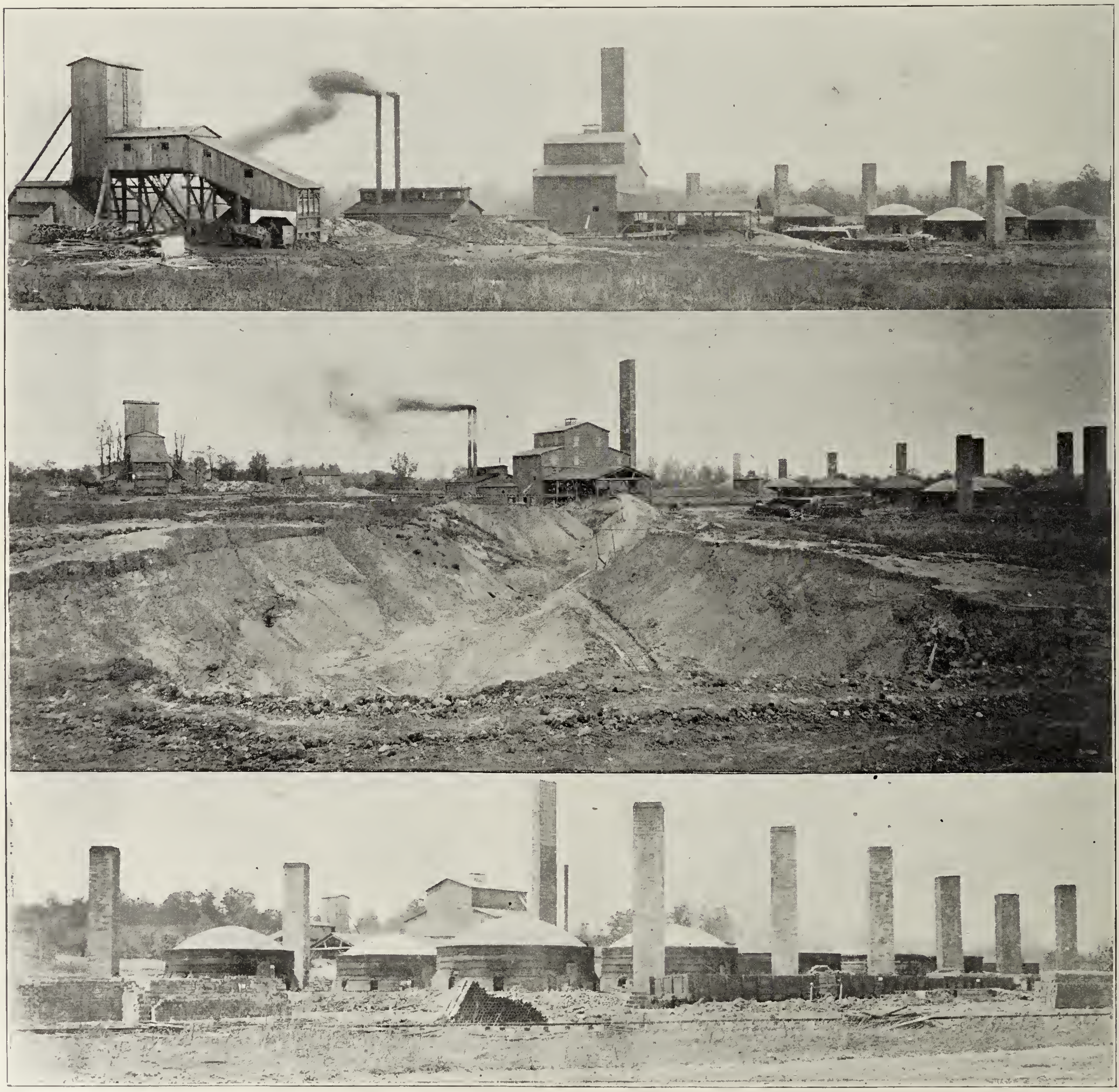
Mr. Broadbent was a good man, a good citizen, quiet, unostentatious in his manner, genial in companionship, a loving husband and father and in every way an exemplary character. His place in life was not a broad one. He was unknown, but we feel sure that he will be missed by those who knew him in the closer relations of life or as a friend and counselor or in the business relations as they apply to his calling and profession. A good man is gone. He leaves a wife and one son to mourn his loss.

—John T. Gillespie, Philadelphia.—

I regret to announce the death of John Gillespie, formerly of the firm of J. & T. Gillespie, brick manufacturers at Twenty-fifth and Wharton streets, of this city. Mr. Gillespie was born in this city, Sept. 17, 1825. In 1852 he entered into partnership with his brother at the above location, and together they did an extensive business in hand stretcher and pressed brick. In 1893 the firm was dissolved, since which time deceased applied himself to the triple duties of treasurer of the Methodist Hospital, trustee of the Hospital of the Methodist Home, and one of the managers of the Church Extension Society. Mr. Gillespie's death was due to heart failure. He leaves a widow, two sons and two daughters. The funeral will take place on the 6th, from his home at 1332 Wharton street.

The Trade Journal Ad.

An ad. in a trade journal will do what traveling men as a rule do not do. It will go to towns off from the railroad, where there are no hotels. It will work nights, Sundays and holidays, in wet weather or dry, hot weather or cool. It will talk to a merchant before some of the boys are out of bed in the morning and after they have gone to bed at night. It's one of the few things that has not as yet struck for eight hours.—Shoe Trade Journal.



Works of the Terre Haute Brick and Pipe Co.

ON THE CLAY BANKS OF THE WABASH.

The sun shines hot these days along the Wabash,
From the kilns the fires are gleaming night and day,
Through the sycamores great clouds of smoke are streaming,
On the banks of the Wabash where there's clay.

THERE IS MORE TRUTH than poetry in the foregoing —much more, for there are all kinds of clay along the Wabash, and much of it is being made into brick and other clay products. Every sweet singer in the land has sung "On the Banks of the Wabash," but we suspect that very few of them have much of an idea where or what the Wabash is. Doubtless most of them think it is an insignificant little stream in an obscure portion of Indiana. Far from it. The Wabash is a great river, more than 500 miles in length. Having its source in Western Ohio, it crosses through the center of Indiana and forms the dividing line between that State and Illinois for a distance of over a hundred miles north of the point where it flows into and becomes a part of the Ohio.

So, literally, the "banks of the Wabash" take in a vast territory rich in mineral as well as agricultural resources. The southern part of the Wabash valley is particularly rich in coal and clays, and will ultimately become one of the greatest clayworking centers in the nation. There are already established there a number of brick, tile and pipe manufactories, each turning out ware the equal of any of its kind.

Mr. W. P. Blair, after a Dusty Ride, proffers a cup of cool water.

In the heart of the territory is the enterprising city of Terre Haute, famous both as a commercial and political center. It is now a city of 40,000 people, who may properly boast of the city's wealth and enterprise. Among other things, Terre Haute is proud of her streets, and well she may be, for she has several miles of the best brick pavements to be found anywhere—pavements that have been down seven to nine years on streets subject to heavy traffic, yet they are still as smooth as any new asphalt pavement. From the time they were first laid to the present they have cost nothing for repairs, and, from present appearances, will continue in first-class condition for a still longer time. The brick with which these pavements were made were of good quality, but the wearing quality of the pavements is not due to that so much as to the method of laying. Of this we shall have more to say in a later issue. Just now we want to take the reader to the plant where the paving brick that Terre Haute is now putting down are made.

—The Terre Haute Brick and Pipe Co.—

This company was organized in 1894, Mr. W. P. Blair being one of the prime movers in the enterprise. He is still the secretary and general manager of the company, and to his hard horse sense and good judgment is due much of their success. The works are located three miles west of town. A switch from the Vandalia line (a branch of the Pennsylvania railroad) runs into the yard, and the main line of the Big Four is within easy reaching distance.

Mr. Blair drove us out to the works in his private carriage, and the trip was both pitcuresque and pleasant, for, though Mr. Blair is not a showy man—on the contrary, is extremely modest—he is good company. Arriving at the works we were agreeably surprised to find more good company in the person of W. R. Cunningham, secretary of the Wallace Manufacturing Co., Frankfort, Ind., who, like ourselves, was out on a tour of inspection, and was also visiting with his first born, now a full-grown man, who has been connected with the Terre Haute Brick and Pipe Company for two years or more.

Mr. Blair and Mr. Cunningham agree that the brick is burned through and through and is first-class in every respect.

Together we made the rounds of the plant, which is exceptionally well constructed and meets every requirement — so much so that if they were to build again they would make few, if any, changes. This is quite unusual, most plants being a series of additions to a central building. The company has one hundred acres of fine clay land, the clay or shale averaging thirty-five feet in depth, and is good from top to bottom, there being but little stripping at the top even. Beneath the clay is a five-foot vein of a fair grade of soft coal, with which they burn all their brick.

The clay is dug by hand and shoveled into end dump cars in the good old way and hauled in part by horse-power, but chiefly by steam-driven cable hoist, and dumped near a Bonnot dry pan. The car is run onto a heavy framework, which tilts up the car and all, dumping the clay in a heap beneath. After being ground to powder it is carried up by elevator buckets some forty-odd feet and deposited on inclined screens, the coarser particles or tailings going back to the pan and the clay to an open top pug mill, thence into a big Wonder brick machine, which turns out 30,000 brick a day easily, the machine really having a capacity of double that quantity. They make side-cut brick and repress their entire product. Their common or standard brick are made 2½x4x8¾ inches. They also make a block 3x4x9 and a sidewalk brick 2½x4⅜ x8¾ inches. The latter is proving very popular, the demand increasing steadily.

From the repress the brick are piled on double-deck

"Standard" iron cars and pushed along (as good things ought to be) into a Standard dry kiln. Mr. Blair does not believe in hurrying this part of the work, so they are kept in the dryer for forty-eight hours, and come out bone dry and entirely free from checks. The brick are all burned in round down-draft kilns, of which they have nine, each having a capacity of 70,000 standard brick. They water smoke twenty-four to forty-eight hours, according to atmospheric conditions, and then raise the heat steadily, finishing in about eight days more, or ten days in all.

The brick are taken from the kilns on barrows and run into cars standing on a switch near the kilns. The tracks are lowered so the bottoms of the cars are on a level with the ground or floor of kiln. When not loading directly into cars the brick are piled out on the open yard. At the time of our visit they had a million or more ready for delivery, but expected to ship them all, together with what they make the balance of the season, before the snow flies.

The principal buildings are constructed of hollow blocks, as are also the chimney stacks, there being an individual stack for each kiln. The blocks are 8¼x8¼x16¼, and were made on the ground. The stacks have a very substantial appearance, there being no indications of cracking.

Mr. Blair reports an increased demand for vitrified brick for foundation purposes, and also finds a market for considerable quantities of both brick and block for railroad culverts and similar work. He recently booked an order from one line for a million brick for this purpose. The plant is so situated and constructed that they can readily turn their attention to flue lining and pipe or tile should the demand for brick decrease, but, from present indications, the demand is more likely to increase than diminish.

A very pleasant evening was spent in Terre Haute, the feature being a visit to the celebrated wine cellars, a cool and inviting place on a summer night. On this occasion the party was joined by I. H. Taylor, superintendent of the brick plant. The following morning, in company with Mr. Cunningham, we journeyed to Montezuma, Ind., some thirty miles to the north, where we spent a pleasant day with Mr. J. W. Carson, visiting the Marion Brick Works and the new tile factory adjoining, a description of which will be given in the next Clay-Worker.

Terre Haute Brick and Pipe Co.—Loading Brick on Cars and Piling out on Yard

WHAT MAKES THE WHITE COME OUT ON BRICK WALLS?

The causes producing objectionable deposits and efflorescence of alkalies on brick walls are natural and extremely simple.

It is argued by some writers that the exudations are entirely owing to unfused sulphates of magnesia contained in the clay of which the bricks have been made.

There is no proof to dispute that bricks which are made of clays containing large quantities of alkalia will, even under favorable conditions, show more chemical action than bricks made of clay with a low basis of the same.

The true theory, however, is that the germ of this chemical production originates chiefly from sulphates of alkalies or salts of some form, expelled with the burning of fuel containing a large quantity of chemical and earthy matter, with which inferior bituminous coals are the most impregnated, which is on an average twenty pounds of sulphate to every 2,000 pounds of coal.

Bricks have a porosity capable of absorbing nine ounces to twelve ounces of water, which is the quantity of the leading pressed front bricks made in the United States. Such bricks will, during every rainstorm, gather sulphate of salts sufficient that in the course of a year or two the alkai base will be strong enough to carry such quantity of alkai deposit to the surface of the brick with the evaporation of the moisture, particularly if a warm day should follow after a heavy rainstorm, producing rapid evaporation of moisture, bringing the alkalies quickly to the front, thereby preventing suspension by crystallization before it reaches the surface.

Should the thermometer fall suddenly to about freezing point just about the time that evaporation is at its highest point, the crystallization would be very complete, assisted both by the peculiar influence of warmth from the wall and the coldness of the atmosphere.

In summing up the case in a few words, it stands thus: As the drops of rain pass through the smoke with a gas-charged atmosphere, they gather every impure chemical and saline matter, and lodge them wherever they strike an absorbent material.

From time to time their increase goes on till they become so strong that even efflorescence cannot develop, but the exudating alkalies take a form of solid crystal, making the appearance of a crust upon the surface, which, by the contact of new moisture by rain, dissolves and again retreats into the pores of its former concealment, but only to reappear at the change of evaporation of water absorbed.

To overcome this tendency to discoloration the leading makers of architectural terra cotta and fine front brick use the following formula:

To the mixture of about forty per cent. ground terra cotta and sixty per cent. plastic terra cotta clays (or other proportions as may be required for the class of ware to be made, or the allowance for shrinkage of clay), add from three to four and a half per cent. finely powdered carbonate of barytes.

The clay and ground terra cotta should be spread out on the floor about four inches in thickness, then the dry powder of the carbonate barytes sifted over it, and the entire mass run through a pug mill at least three times in order to assure the thorough incorporation and uniform distribution of all the materials.

It is preferable to store the clay thus prepared for forty-eight hours or more, allowing the carb. bary. to act upon the soda and sulphate of magnesia, which it neutralizes, while the alkalies are in process of solution. During the burning or firing of the wares the carb. baryta has no influence over the alkalies or any other ingredient, and does not in any manner improve the ware.—Ohio Valley Manufacturer.

"Many folks am disappointed with life bekase dey fail to realize dat deir am an eternal fitness of things. When yo' drap de price of whitewashin' from 75 cents to 50 cents de whitewasher draps in less lime an' pours in mo' water to maintain de equilibrium. What yo' save in yo'r purse he saves in his pail, an' so yo' hain't no better off."—Exchange.

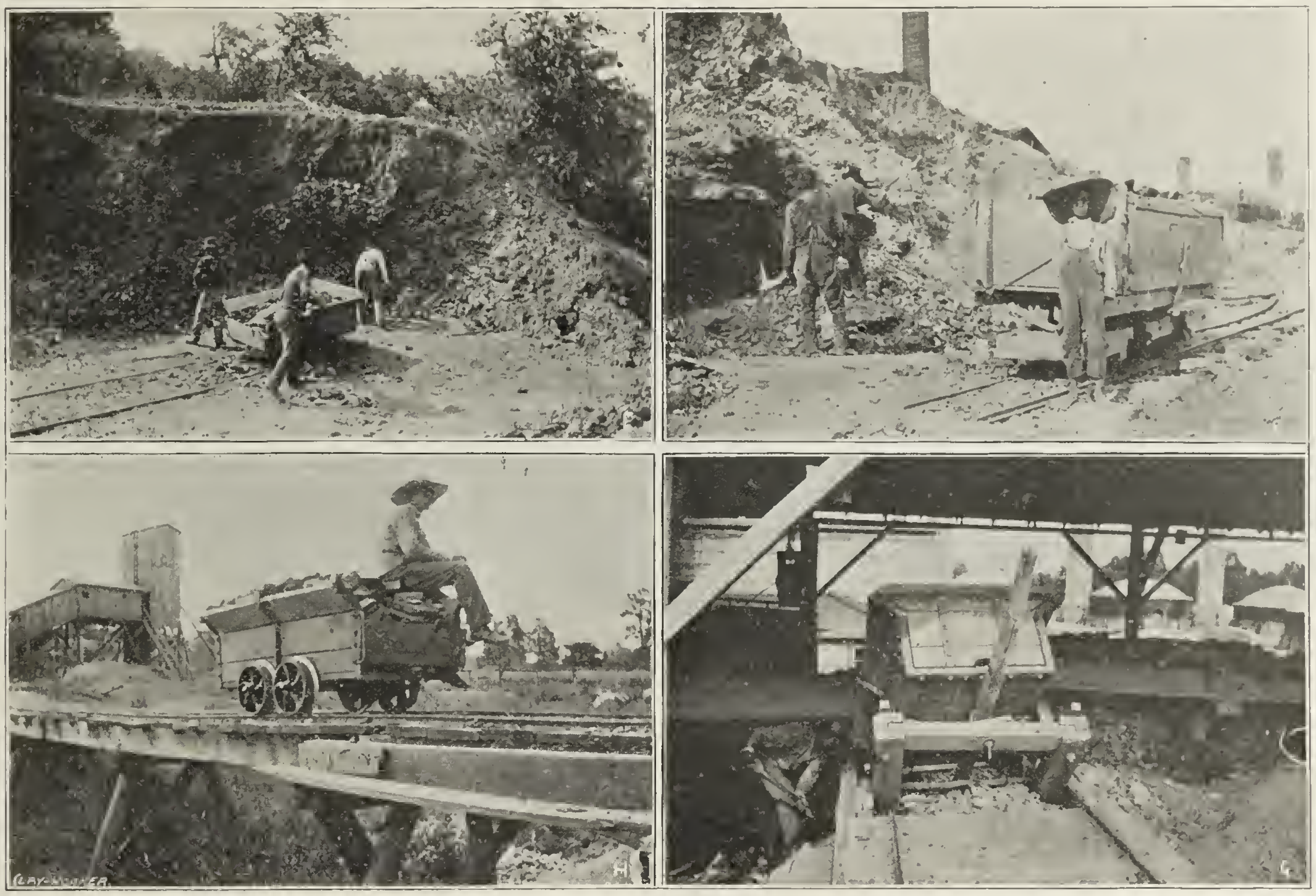
Written for The Clay-Worker.

OLD AND NEW BRICKYARD METHODS.

THE OLD WAY of making brick gave way to more modern ways of manufacturing. There had to be a stride in advance in the handling of the green brick from the machine to the yard as well as from hack to kiln. No doubt memory recalls to some of your readers, especially any of them who first took to brickyarding, if it was at a period when each man carried off his mold of brick in his hand and dumped it on the yard, and on his return to the machine to hear the molder, as only an "Irish molder" could call out, "D— you, sand your mold," with strong accent on the mold. Many a man was driven away by that loud tone, as he thought he had committed some crime because he had forgotten to sand the mold.

The open or sunshine yard of to-day is better equipped than its predecessor of years ago. No more carrying off by hand. The truck with its five molds is the medium of conveyance, and many a good trucker has come to grief and had curses showered on his innocent head when he, as a greenhorn, has come in on a dead run with his truck of empty molds, and knocked men and loaded truck over—no damage done, only the loss of a few minutes of time to get things in shape. I have seen, a number of times, men run off the yards, simply because all hands around the machine, instead of trying to help get things going, would begin to curse him. The habit of using profane language (and, I am sorry to say, generally the foreman is the worst one on the yard) has taken the place of speaking kindly to a man, and thereby help him instead of confusing him by calling him names, and, if there is anything that a green horn will learn, it is the meaning of swear words.

I am safe in saying that there is not a reader of the Clay-Worker who has had charge of a brickyard who will say that he has not seen anything but the best efforts of a greenhorn put forth if spoken to kindly, and a few moments spent in showing him how to do what is required of him. To-day, more



The Terre Haute Brick and Pipe Co.—Getting in the Clay.

than at any time in the past, are men's best efforts required on the yards. Go on one of the yards to-day and see what the men do for a day's work. Let memory go back to time past, and then compare the amount of work done and what is required to-day, and the fact is evident that twenty-five years ago it would have been said it is impossible—men cannot do it. Still they do, and, I am sorry to say, without any corresponding benefit to the boss, so far as returning him any more pecuniary benefit. The boss who would ask to have his yard run on the lines of twenty-five years ago, or the foreman who could not handle a yard as now operated, would be looked upon as a curiosity, but not equipped for the trade.

Twenty-five years ago the man who did all his work—that is, made, set, burned and loaded on wagons or boat while he was making—with a man to the thousand was a good one. If he averaged more or less than that number of men he was an exception. He was expected to wheel and pile under the shed green brick off his hacks which were not fit to set. On stormy days he could set his shed gang or the whole gang to work under the shed setting, walling, daubing, taking down or platting or any work he saw fit to have done. I almost hear the echo of "Could such work have been done?" Yes, and it was near Christmas before the last kiln was burned. When the last pit was molded the shed was piled along the eaves and on any space vacant on the kiln ground eighteen high with green brick, single coal.

The Terre Haute Brick and Pipe Co.—The Standard Dryer and a "Standard" Car loaded with Standard Paving Brick. Bone dry without a Crack.

To-day the man who would attempt to or propose to the boss that he pile under the shed, except double coal, would be looked upon as behind the age. The only exception there would be if, after his hacks were doubled up and the weather had continued bad, and he wanted the room, he might possibly wheel them under shed, even under that possibility of room to get out another pit on the yard. A few years back I told you of a yard where the hacks in some cases seven deep; in fact, there was not a single hack on the yard; all the hacks were three, five and seven deep, and that in the month of October. Frequently in the fall one might have seen all the hacks doubled, and that is not considered good judgment, but to get the yards clear to put out more brick is the cause. Some may say, would it not be better to wheel them under the shed? The cost would not be much per M. True, but I do not think that there is any trade where it costs as much to handle anything connected with it, except in the direct line from hack to kiln, as on a brickyard.

For comparison, we will see what it costs to move that pit of brick under the shed to make room, instead of taking it off the hack and setting it in the kiln to clean the hack. One setter at $2.25, three wheelers at $1.50, or $6.75 for labor to strip the hacks of the pit of brick of, say 22 M. Some yards may have more, others a little less, but, for an average, that is fair; as for the wages, they could be advanced. At a glance one sees that 22 into $6.75 means a cost of a trifle over 30 cents per M. That sum would have put them in the kiln, where the expense would end. That amount has put them under the shed, where, at some future time, they will be set in by the same amount of labor as well as at the cost of another $6.75. I think that shows why some men in the trade never made money, or, I may say, when they laid aside the cares of this world their estate showed nothing. Too much extra work. I say it with all seriousness that no man in the trade but must cut off all corners—that is, see that no extra work is done but what is absolutely needed. As around a kiln when burning, to have men working when not producing, except after molding has ceased in the fall, is simply taking money out of the pocket and at a rate that its beyond comprehension. If an object lesson is needed, it would not be a difficult matter to cite a number of instances. The small leaks will get larger. When a dollar or more profit per M is in sight, one should, even then, be very careful of doing any extra work. I think that the readers of the Clay-Worker will sustain me when I say that as one looks over the trade and at those who have been engaged, there are found less really wealthy men connected with brickmaking, where they have followed it up, than in almost any other line of business.

There are times when one engaged in the manufacture must make money. When from two to three dollars per M is in sight he has a bonanza, and he sticks to it. Time rolls on; the same man is still in the trade; the large returns are a thing of the past; the business depression lasts for a term of years, and the manufacturer becomes involved. It falls as a great surprise to learn that he has failed. "Why, I thought he was well-to-do;" "He must have made money," is remarked on all hands. In this connection I may say that he, to all outward appearances, was conservative in his way of living. Those who were near him in the trade could give a clear explanation of the cause: Simply not giving close attention to all that was done on the yard. An over-confidence in the man in charge, possibly following in the same line of steps that had existed for many years. Well enough when there were large returns, but when returns were being reduced week after week, and he continued on the old line, while his neighbor was carefully looking over his business to see where he could reduce cost of output. Our friend seems to think there is no need to reduce cost, but drifts along to certain destruction. Another may have an idea of a cheaper way to burn brick, and keep on experimenting with coal, which would be all right if he started right by putting in a well-equipped plant, with one in charge who knows how to burn with coal. But to tempt fate by experimenting with three or four arches, and with those who do not know anything at all about that way of burning, is a certain way of courting loss.

As far back as 1856, in Haverstraw, two brothers, both quite well-to-do for brickmakers of that day, tried burning with coal. The readers of the Clay-Worker are well aware that there were no such kilns then as are in use to-day. It was an experiment, pure and simple, and came very near being a costly one to both. One kiln was enough for one of the brothers, the other must needs go further, with the result that the other brother had to go financially to his assistance. So, on through the years, one or more has been found who wanted to experiment till sheer force of want of means has compelled them to stop.

The brickmaker is almost sure to be dissatisfied if he is making a first-class grade of brick, he feels sure that he can make it better, and will take measures to do so and probably in a little while be a very sorry individual, thinking if he had only left well enough alone. We find occasionally one who thinks he can save wood by adding more coal dust. His foreman makes first-class burns, a point he has reached after years, it may be, of close attention to the quantity of dust to use to reach a desirable result. Now there must be made a reduction in the cost of his brick, and he proposes to do so through a medium, the most dangerous one for a full pocket book of anything used in making brick. No argument of foreman or friends will have any effect. The foreman knows that his reputation is at stake to a certain extent. He sets fire, gets the kiln hot and he finds that no matter how slow he fires the kiln is too hot and he cannot hold it back. When opened instead of seeing, as formerly, a clean burn, there appears a very large number of swelled brick, and so all through the kiln, with a consequent loss.

Another, and it seems to be universal among the bosses, that if he can buy cheap wood he is making money by the transaction. There never was wood too good to burn brick with, the better the wood the better the result. To see the class of wood that is furnished on some yards one would conclude that good results were not expected. At certain stages any kind will burn, but at the stage of heating-up wood is required that is not only good, but of a size that those in charge can hold the fires as they wish. Not only does it entail far more labor and certainly it is no easy or cool job to heat up a kiln in summer. To furnish a lot of large, round, with a small percentage of split wood in it is too expect a poor burn. The foreman does his best and does not have as good a burn as usual, he is blamed for not attending to the kilns as he should. A few years ago a retiring brickmaker bought wood enough to burn his last kiln of the season, as well as the last he expected to make. The wood had stood for three years and no other brickmaker would buy it. There was no strength in it. The kiln was a complete failure, as it was impossible to get a hard-brick heat, keep it and drive it when opened. A good grade of light hards was the result. The foreman had to bear the blame. though for years he had always turned out a first-rate grade of brick. By those who knew the cause the blame was placed where it belonged.

Mr. Cunningham Samples the "Pump Water" and Examines the Hollow Block Stack, and Pronounces both Excellent

Written for the CLAY-WORKER.

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 1.

BY ALFRED CROSSLEY.

THE EDITOR of The Clay-Worker has requested me to write for his valuable journal an article on the above subject. In responding to his call I will say that, although not now a resident in the United States, I have no trouble in transporting myself there, in thought, again, amidst familiar scenes, and will, therefore, write from an American standpoint, and thus render myself more intelligible to my readers. Further, by way of introduction, I wish to say distinctly that in the discussion of the subject in hand I am not going to set myself up as an oracle or pose as an expert, for I feel myself to be more of a learner than a teacher, but will simply endeavor to put into form what I have gathered in my limited study of the subject, and my deductions from my own experience and investigations. How far at times I may be right or wrong in my ideas is perhaps an open question, on which there may be room for considerable difference of opinion, but, if I say some things that won't "go down," I don't want any one to choke in the attempt to swallow them.

The extent and importance of the fire brick industry in the United States is increasing more and more every year. Probably a large majority of people do not realize the value of this industry to the country at large. A successful manufacturer said to the writer on one occasion that some years ago, when fire brick works were much fewer in number, he used to be somewhat apprehensive at the establishment of new works, lest the market would be glutted. "But," said he, "where there was one factory then there are a hundred now, and still we manage somehow to find an outlet for the brick, and, like other people, we are figuring on putting up new works." It is a fact that the development of the fire brick business in the last twenty or thirty years has been enormous. Not only have such large numbers of new concerns been started but old works have doubled, trebled and quadrupled their capacity. One cause of this remarkable expansion is that domestic production has to a large extent crowded out the imported article. A still greater cause, however, is in the wonderful development of iron and steel manufacture in this country, which has in turn furnished a strong stimulus to this and other industries.

Such a commonplace thing as fire clay and brick may appear to some people as of very little importance in the consideration of the industries of the country, and yet it is so directly connected and closely interwoven with that industry which is head and shoulders above all others, both in England and in the United States, viz., iron and steel, that the modern achievements of metallurgical science would be impossible without the assistance of its humble and perhaps to some extent despised servant. Every fresh development and improvement in the iron business has successively called for a better and more refractory fire brick, and, so far, this demand has been met. The brick that satisfied the ironmaker of a century ago would be rejected for furnace use to-day, and this is right—the world moves.

A strictly correct definition of the term "fire brick" is perhaps not easy to give. This, like many other terms, is somewhat elastic, and is often applied to brick of, to say the least, very dissimilar character. A fire brick may, in fact, be described as any brick, made from any material, capable of resisting fire, and thus all brick, in that sense, are fire brick, for all will resist fire successfully up to a certain degree. In point of fact there are common brick that are really more refractory than some which are classed as fire brick. It is this very property that all clays have in common, of being to some extent fire resisting, that has led to many ridiculous mistakes on the part of people who are uninformed. Although it is true, as stated, that the term "fire brick" is somewhat elastic, yet it ought to have some clearly defined limits. In some quarters it includes a great variety of brick. In my judgment, the term should be restricted to those brick that are sufficiently refractory to permit of being used in metallurgical operations. This again is liable to cause a little ambiguity from the fact that for cupola linings and some other purposes brick under the name of fire brick have sometimes been used that were of decidedly inferior quality, and not good enough for that purpose. On this question of quality it is difficult to draw the lines. Like many, if not most other things, it is by comparison we judge. Fifteen or twenty miles an hour was at one time thought to be a dangerously high rate of speed for railroad trains, but now we go three times that speed, and are still not satisfied. So what were regarded as first-class brick fifty or sixty years ago would doubtless be classed as second or third-grade now.

But intelligence and application in the use of fire brick is likewise necessary, as well as good quality; otherwise a really good and excellent brick is liable to be unjustly condemned, and this has not infrequently been the case. Hence, a brick that is recommended by one man in the highest terms, and that has, in fact, given him good satisfaction, may, when used by another prove to be utterly useless. Whence the difference? Not in the brick certainly. For the first man's purpose it was, as stated, a good brick; for the second it was no good at all. It is like a rope or chain, which, loaded within its tensile strain, sustains the load and is pronounced reliable. Another person takes the same rope, loads it two or three times as heavy, with the result that the rope breaks and is condemned as worthless. Hence, some of the leading fire brick manufacturers prefer to have customers name the purpose for which the brick are required, so that they may send a grade suited to the purpose, and thus protect their reputation. A fire brick that is first-class in a blast furnace may not give good results in a puddling or heating furnace, and the very best brick for a hearth or bosh is about the very worst for the tunnel head.

And so with clays. The clay that makes a high-class brick for one purpose may not be very good for another, although in this particular much depends upon the skill of the manufacturer, of which more anon. Of course, the first requisite for good fire brick is good fire clay. This is the foundation. After this come proper appliances and intelligent manufacture. These are nearly as important as good clay, for that, however good, may be spoiled in manufacture. It used to be a saying that "God sends meat and the devil sends cooks." Nature has certainly done her part in giving us the different varieties of clay suited to fire brick for different purposes, and it is for us to recognize this fact and make an intelligent application of it; but in the manufacture of fire clay it is a little surprising to note the difference in quality of product that may be made from the same clay by different methods.

The term "fire clay" also is somewhat ambiguous, and is used to describe an almost endless variety of clays, some of entirely dissimilar and even opposite character. The amount of ignorance, among certain classes, prevailing on this subject is remarkable. Many people appear to have an idea that any clay other than red brick clay must be a fire clay. Such, at least, is my conclusion from the character of many of the specimens sent to me at different times for my opinion on them as fire clays. Take a typical case. A man walking over his land in search of squirrels, or anything else to pass away the time, comes across some clay that is different in appearance from the ordinary brick clays that he has seen. He has heard of fire clays one time and another, and quick as a flash it comes to his mind that this must be fire clay. Visions of easy wealth from royalties come before him, the squirrel hunt is forgotten, and, gathering some of the strange looking clay, he starts home. Meeting one of his neighbors he shows it to him, and they discuss the matter together, with the conclusion that it "sartinly must be fire clay." To put the matter to a test a piece is put in the house fire, and they perhaps even go so far as to put a piece into a blacksmith's forge and blow it till it gets to a bright red heat. When the pieces are cold they are perhaps a nice buff color, which settles its identity beyond all doubt. Some of the clay is then sent off to be made into fire brick, which, when put to the test in some place where it is hot, runs like water. Such, in brief, is the history of many a fire clay excitement. Certain announcements occurring from time to time in the trade papers also indicate how wide a misapprehension there is on the subject. Every once in a while the statement would appear that in such and such a place in Illinois or Indiana, Alabama or Tennessee, a wonderful deposit of the finest and purest fire clay had been discovered, of unlimited extent, and ranging in thickness from twenty, thirty or forty feet to unknown depths, the quality of which was pronounced to be equal and often superior to any in America or England. Such discoveries, if true, would be apt to disturb the equilibrium of the fire brick business to some extent, but one rarely ever hears anything further of them. These announcements were not usually made with any intention to deceive, but simply from mistaken notions of what is and is not fire clay. My personal knowledge of fire clay veins is practically limited within certain areas, but I have seldom heard, to my recollection, of genuine fire clay being found in these extraordinarily thick deposits. I remember having seen in one place a thickness of twenty feet or more, but this was only a local fault in the vein, and did not extend very far, the average thickness being from three to five feet only. Some of the veins in the great Savage mountain, Pennsylvania, from which the celebrated Savage fire brick are made, ran as high as twenty-five feet thick, but this was a noted exception to the rule.

We have stated that the term "fire brick" may, if carried to its extreme meaning, be applied to any brick, made from any material, capable of resisting fire. We have, however, insisted further on the restriction of the term to those suitable to metallurgical uses, where extraordinary heats are required. The same applies to fire clay, and any clay that will not come within this definition should not be regarded as true fire clay.

To many people such a remark may appear superfluous, but to the general readers of this paper I think it will not. It should be evident to any thinking person that there is a great difference between a clay that will vitrify at a heat of 1,000 to 1,200 degrees C. (1,832 to 2,192 degrees Fahr.), i. e., below a white heat, and a clay that is practically infusible at the highest furnace heats, say 1,600 degrees C. and upwards, and hence to call them both by the one general name of fire clay causes the confusion already noted. Until some one shall suggest some more appropriate and specific name for fire clays of the first named or fusible class, let us bear in mind the difference I have here pointed out.

(To be continued.)

Three Requisites to Success.

Samuel Sloan, for years president of the Delaware, Lackawanna & Western Railroad, upon being asked what traits of character he considered the best promise of success in a beginner, named integrity first, second earnestness, and third application of details. He believes that a man possessing these qualities is bound to win.

BY THE LIGHT OF THE KILN FIRE

DID YOU EVER SEE a city fire department tackle a burning kiln shed when a kiln was being burned beneath it?" asked the lounger as he spread his length across the wood pile and caused the burner to growl and grope four others away for wood to feed the hungry mouths forming the loungers' resting place.

"It fills me full of pain to see the way a trained body of fire fighters lose their discipline and good sense at the sight of a fire in a brickyard. I remember one time I was sitting up a watch alone at a kiln during the first night of the burning, and the shed caught fire. The damphool boss had set his arches close against a dry cedar post that was hollow in the heart and full of dry tinder, as rotten cedar is apt to be. I was calmly snoozing along, half asleep, on the wood pile, listening to the soft, thick murmur peculiar to the first night's fire in an old-style clamp, when a spark found its way somehow into the center of the cedar post, and in half a jiffy I was brought to my senses and my feet by a bright blaze overhead. Looking up I saw a stream of flame shooting far up above the top of the post, and in five minutes the roof of years' old hemlock was a roaring, crackling, world illuminating conflagration.

"There was only one thing to do and that was to stand off and let her burn. The roof was a small, temporary affair, and there was no particular danger of loss to anything but the few dollars' worth of boards comprising it. I was calmly enjoying the brilliant spectacle when I was unduly startled by the loud jangling of bells, the roar of wheels rushing over rocky roadways and a hubbub of voices issuing from the town nearby. It was the fire department coming and followed by half the town.

"I knew at once what would happen if I didn't check their progress before they reached the yard, and ran toward them and shouted for them to stop. But you might as well try to stop an avalanche. They rushed past me like a Kansas cyclone, and overran the yard with the fury and fervor of the Goths and Vandals in their attack on Rome. They ran their fire engine through 30,000 newly made bricks on the flat, a ladder wagon ran into and knocked over half the first arch of a newly started kiln, an infuriated mob overturned a dozen hacks and horses and men trod them into dust and shapeless dough.

"But that wasn't the worst. The roof was now fairly burned, and the fire was declining for want of more fuel. Not more than fifteen dollars' worth of lumber had been destroyed, and the kiln up to that time was unharmed. But soon the engines got connected with a reservoir, and, howl and shout as I might, I could not make them understand that they should not pour water upon the kiln. Four great streams soon poured in upon the burning roof and fell down upon the kiln and poured over the sides on all sides in cataracts that totally extinguished the feeble fires in the arches. The hook and ladder men, anxious to distinguish themselves, had pulled down the charred fragments of roof and supports and scattered them broadcast in the bricks still left untrampled upon. They had also hooked into and pulled out several layers of brick in some of the arches, and such a mess as that yard presented when the sun rose next day was an everlasting promoter of night-mare to a brickmaker.

"It cost the proprietor fully $1,500, and was wholly uncalled for, but the next day the local papers devoted a whole column to praise of the fire companies. Did it make me sick? I should say! But one thing in the papers offset the sickness caused by the praise, and I laughed—I laughed—well"—and here the lounger relapsed suddenly into silence.

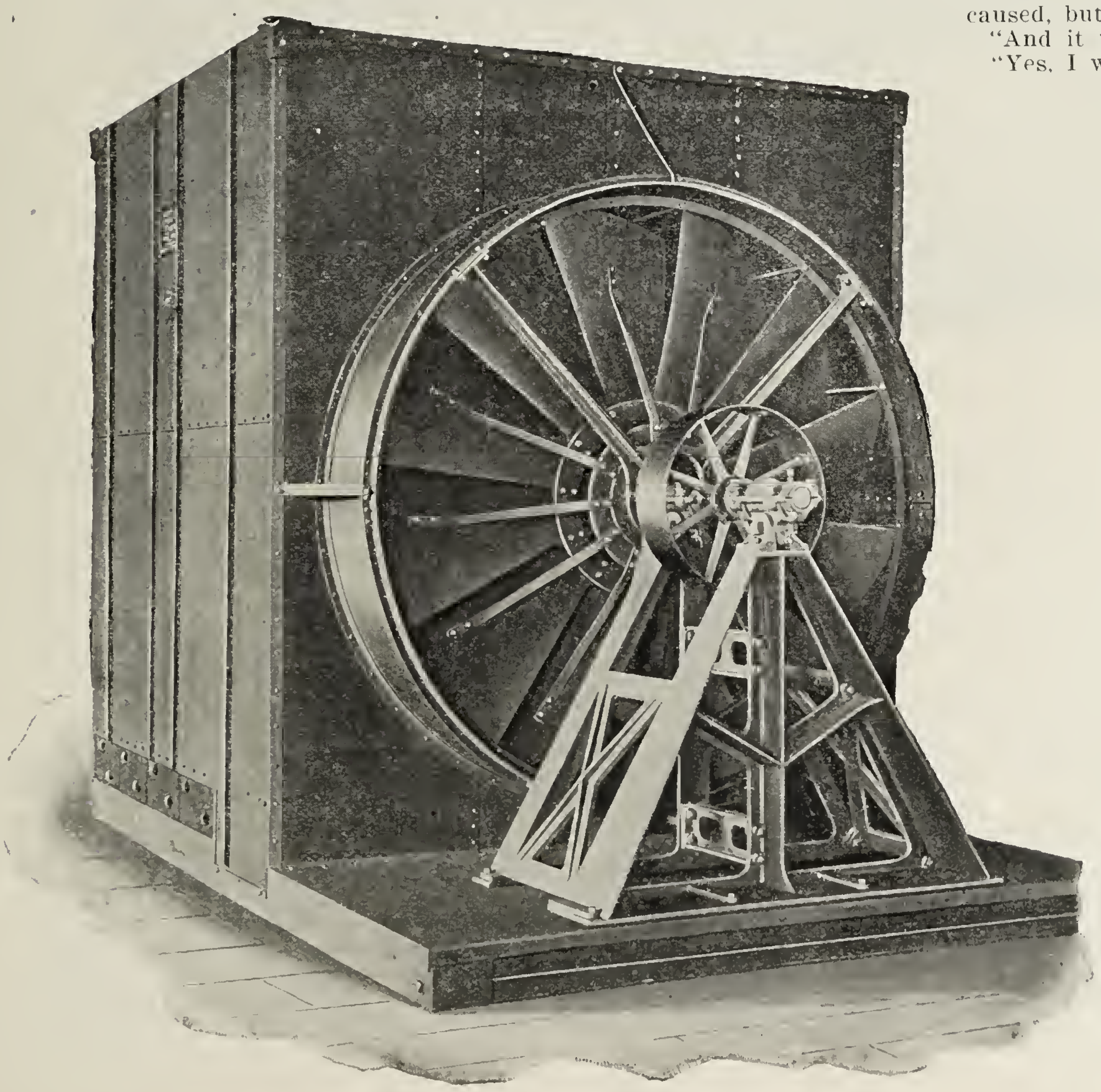
"Well?" somebody ventured to ask.

"Oh, yes," said the lounger, "it was a small item telling about the dastardly work of some miscreants at the fire who sandbagged two of the engine crews in the dark, and blew off the steam, and who hit the fire chief with a great half-dried mass of mud in the back of the neck, which laid him cold. It was some satisfaction for the ruin the damphools caused, but it wasn't all I wanted to do."

"And it was you who—?"

"Yes, I was 'the miscreants.'"

THE DREAMER.



DRYING BRICK.

If progress is any sign of life (and we believe it is), the American Blower Company, of Detroit, Mich., is "very much alive." The progress of this concern in the drying of brick is not unknown to most readers of this journal. A recent improvement in the apparatus used in connection with their "A B C" brick dryers is shown in the accompanying cut, illustrating a new design of steel disc fan heater front for brick dryers of large capacity. This construction gives the bearers great rigidity, enabling the fans to run at high speeds without any possibility of vibration. This is only one of many improvements, all indicating the determination of this company to retain its position at the head of the procession. Brick manufacturers who are in need of dryers, or who have "troubles of their own" with their old ones, will do well to communicate with the above company about their requirements.

Written for The Clay-Worker.

PHILADELPHIA'S COMING EXPOSITION.

A Good Opportunity for the Exhibition of Terra Cotta, Brick and Tiling.

RAPIDLY NEARING completion, this immense structure, erected for the purpose of creating and maintaining a good commercial relationship between the United States and the outside world, offers also splendid facilities for clayworkers in general.

The main building of the National Export Exposition is 1,000 feet long and 400 feet wide. This includes three pavilions two stories in height and a spacious auditorium with a seating capacity of 5,000.

The building covers an area of nine acres, with a floor space aggregating twelve and one-half acres, located on the western bank of the Schuylkill river, and within one mile and a quarter of the city's center.

Spaces will be charged for at the rate of one dollar per square foot for interior exhibits and fifty cents per square foot for outdoor exhibits.

Arrangements have been made by the authorities with the railroad companies for the shipment of goods at one-half rates. In other words, goods that have not been sold or transferred will be returned free. The Pennsylvania railroad runs within a stone's throw of the Exposition, but, in order that the goods shipped may be delivered with the least possible delay, a switch has been connected so that cars may run right into the main building and there be unloaded.

The following schedule will be in effect:

From cars at the Exposition grounds to exhibitors' allotted spaces in buildings, no single piece, machine, crate or box over 2,000 pounds in weight, 3 cents per 100 pounds. For all large pieces, crates, boxes or machines weighing more than 2,000 pounds, each piece, 5 cents per 100 pounds.

From local railroad stations and wharves to exhibitors' allotted spaces in buildings, no single piece over 2,000 pounds in weight, 5 cents per 100 pounds. Machinery, boxes and crates weighing singly over 2,000 pounds, 9 cents per 100 pounds.

Minimum charge for any lot, 50 cents.

Local exhibitors delivering their exhibits at the Exposition buildings in their own conveyances can have wagons unloaded and the goods placed on their allotted spaces at the rate of 3 cents per 100 pounds.

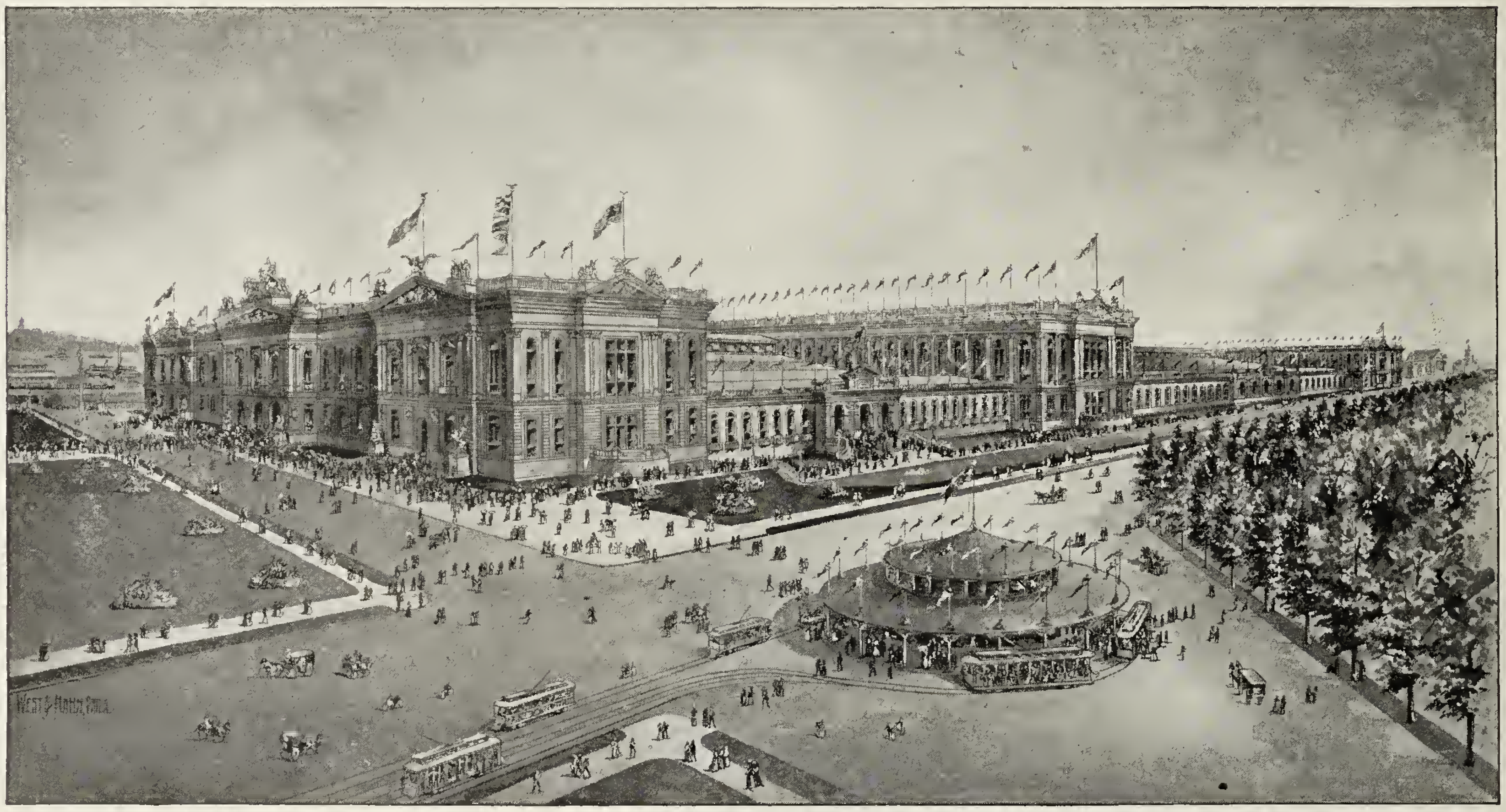
The main entrance is in the north pavilion, opening into a lobby 60x90 feet, and between this and the central pavilion is the auditorium, 200 feet long and 140 feet wide. On either side of this are the arcades for exhibits, 78 feet wide by 300 feet long.

The approximate cost for the grounds and buildings will be close upon $1,000,000, of which $573,000 will be devoted in the erection of the main building.

The pavilions are constructed of brick and structural steel, and are each 90x380 feet, flanked at the entrances by pedestals and groups of statuary representing various industries, further illustrated by the pediments over the various entrances containing heroic figures symbolizing the various aspects of manufacture and commerce.

Here for the past four or five months the clayworkers of this city have been devoting their time to the delivery of bricks, and the terra cotta men to the decorative forms of commercial sculpture.

Philadelphia men are hopeful that through this channel the eyes of the world and the ears of the States may be opened to see and to listen to the many advantages offered by our manufacturers and producers. Nearly every nation will be represented from the antipodes to the far Orient. Music will mingle with the rippling waters, and pleasure walk hand in hand with business, and the aftermath of business means dollars and cents.



Main Building National Export Exposition, Philadelphia.

The Exposition will open on the 14th of September, and close on November 30. Those desiring space should apply to the National Export Association, W. P. Wilson, director general, Philadelphia, Pa.

The clay and sculptural parts has given work to many sculptors engaged by J. Franklin Whitman & Co., who, notwithstanding the small space of time allowed, have risen to the occasion and given allegorical and symbolical groups that are dignified and acceptable for the purposes desired. And Mother Earth is well represented by skilled and technical labor in all that applies to the clayworker.

MITSCHKA.

For the man who understands that success is simply doing one thing well, the way is clear, the end sure. Blow by blow, through earth and rock, he will toil till a final stroke shall break through to the crumbling quartz and lay bare the yellow ore of realization. Success lies near for some; for others deep; let who would find it dig.—Birmingham Business College Journal.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Large vs. Small Kilns.

Editor Clay-Worker:

In the July Clay-Worker Mr. Stookey recommended burning large kilns for several reasons, one of which was that it is not so wearing on the men. What he would call a large kiln he does not tell your readers. He might mean anywhere from ten to thirty arches. The demand for brick should largely govern the size of the kiln. How is he going to supply stock? If he takes time to build large kilns his customers will all go elsewhere for stock. If a shipper by water, he would find he'd get left many times if he waited to make a larger kiln.

As to nervous exhaustion, does he think a man who has thirty arches on fire would be under less stress of mind than the one who has ten? Certainly he would not. Again, the burner who looks into the "spy hole" of a thirty-arch kiln is more likely to give out than the one who looks over a ten-arch kiln. Would a man, after shoving them up, go on top and help stop cracks, last longer in this world if he was on top of a thirty-arch kiln?

I may be wrong, but it seems to me as though a small or medium-sized kiln is the best for the burner's health.

A READER.

Arcs of Kiln Crowns.

Editor Clay-Worker:

I notice that Brother Eudaly differs with me in regard to the delineation of the arcs of the crowns of round kilns, when he says "No absolute rule can be given for pitch or size of a crown." The difference cannot, however, be very serious, for in the closing sentence of his letter he says, "In my next I will give you some rules for determining the proper arc for kiln crowns." That is what the trade wants, and, not only rules for making the crown, but for all the parts of a down-draft kiln. We believe that rules may be established for determining all the proportions of a down-draft kiln. No one man may have sufficient knowledge of the work to do this, but the knowledge does exist among the thoughtful, skillful men in the clayworking fraternity. Let them approve or condemn what is written in The Clay-Worker, and definite knowledge will be obtained.

Having carefully read the sixth paper on "What Kiln Shall I Build?" by "Flame," the writer will give you his impressions of same, as requested, desiring that what he shall say shall not be considered as a criticism, but an effort to determine what is best. It would be much more agreeable to represent what he considers the best form for the different parts of a kiln and give his reasons therefor than to review any man's paper and point out what he considers objectionable. "It is better to fight for the good than to rail at the ill." The advantages of a correct form are often made more strikingly apparent in comparison with a defective form and the faults of a defective form more manifest by such comparison. Whatever is given to the press becomes, in a large sense, public property, and should be considered without reference to the author. If an article makes valuable suggestions they should be approved, but if, on the contrary, it makes suggestions which are likely to lead men into making profitless expenditures, they should be condemned.

A well-made furnace having inclined grates has a draft when the kiln is at high heat, like a Franklin stove, downward through the coal, which carries all smoke under the fire brick arch, where the heat is intense. The space across the coal hole over the grates is equivalent to so much additional grate surface. The down draft through the coal should prevent the coal from becoming all afire. The side walls of the furnace should be raised on the sides so as to form a magazine for surplus coal, which settles as it is consumed, taking fire as it meets the cross draft through the grates. These features have been proved to be valuable by a trial of many years. The writer built a kiln with furnaces having these features thirty years ago. It was the best form of furnace then for the down-draft kiln, and is the best form to-day. We have known of a number of kilns being built for the same factory, some with furnaces with inclined grates and some with horizontal grates, and all horizontal grates were changed for inclined grates, on account of greater economy of fuel and labor. If the furnace wastes carbon in the smoke outside of the kiln, the cause may be in those things which affect the draft, too close setting of the ware, obstruction of the floor flues, accumulation of ashes at the bottom of the grate, obstructing the passage into the bags, or too short a stack.

When the furnace is properly made it needs no door in front or covering for the top. Indeed, such an arrangement would destroy its character and effectiveness in a great measure. Do you not see that with an iron cover the coals would all be aflame and the cover soon shriveled by the heat? Much better have the horizontal grate with fire brick arch.

The down-draft kiln, made right, set right and rightly handled, is one of the best illustrations in the arts of the perfect combustion of fuel. When at high heat in burning sewer-pipe it is a beautiful sight to look down through the holes in the crown. There is no smoke there; the kiln seems lighted by electricity. When the salt is thrown into the kiln it is filled with saline vapor, like steam, which soon passes away, and then the marvelous changes appear, and the clay pipes seem like intensely heated glass. It matters not how many times I have seen it, the sight is and always will be interesting and very beautiful.

It seems to the writer to be very important to the clay-workers that they establish on a scientific basis all the proportions of a down-draft kiln. GEO. S. TIFFANY.

Artificial Dryers—A Discussion by a Mechanical Engineer.

Editor Clay-Worker:

I have been studying the article by "A Master Mechanic," on page 432 of the May Clay-Worker.

It seems to me that the writer is rather unguarded in some of his statements. He says, "The expression we often heard eight or ten years ago in our conventions, 'There is nothing cheaper or better for drying brick and tile than God's free air,' has been proven to the contrary; many different plans have been tried, adopted and discarded."

Logically the fact that many "different plans have been tried, adopted and discarded," neither proves nor disproves that the natural method is or is not the best or most economical. These various plans may have been imperfectly designed and executed, and only carry proof in reference to their own peculiar methods.

There are only two essentials in drying, viz., heat and ventilation—heat to change the water in the wares into vapor, and ventilation to carry the vapor away. A certain amount of heat is required to evaporate the water in the clay. Whether this heat is taken from sunshine or from the coal bin the amount required is the same.

The latent heat of aqueous vapor at the boiling point, 100 degrees centigrade, is 540; that is, a pound of water at 100 degrees absorbs in vaporizing as much heat as would raise 540 pounds of water through one degree.

This gives an intimation of the amount of heat used in drying. The fuel required, together with the expense of attendance and the cost of the apparatus, places the expense of drying by artificial means far beyond that of natural methods.

Whether the ventilation is produced by natural currents of air or by fans, chimneys or vapor stacks it matters not. The simple fact is that the change of air must be made, and the method that will make this change with the least expense is the cheapest. So is that method cheapest that will supply the required heat with the least expense. I have never heard of a system that was cheaper than "God's free air," and never expect to.

As to which method is best is an entirely different question. I realize that the cheapest may not always be the best, and yet when we remember that plants are operated for the profits that may be had from them we are almost driven to adopt the cheapest methods. Many claim that the natural method is too slow, and it probably is for the amount of goods that their ambition desires to produce, but it might be fast enough, if given a fair chance, to produce as large profits as they realize from their faster but more expensive methods.

Artificial dryers are very effective for plants producing large quantities of goods, but some people are skeptical yet as to their profitableness in the majority of cases.

Further on he says, "We all know that so long as water is in the form of steam it has 212 degrees F. of available heat."

I fail to understand what is meant by this. As long as it is in the form of steam it has its latent heat of vaporization which is available and may be obtained simply by allowing the steam to condense into water at 212 degrees.

As stated above, this latent heat at 100 degrees centigrade, which is the same as 212 Fahrenheit, and is the boiling point of water, is 540, or each pound in condensing gives off enough heat to raise 540 pounds of water one degree centigrade. As the Fahrenheit degree is smaller than the centigrade the number of pounds would be greater, and the figure becomes, by calculation, 972 pounds of water for the Fahrenheit scale.

After condensing from steam at 212 degrees to water at 212 degrees and giving out this great amount of latent heat the water still has just as much available heat as may be obtained by cooling it from 212 degrees to the temperature at which it is to leave the dryer.

Again, our friend says that "With a properly constructed dryer there should not be over a half pound of back pressure to the square inch."

Now, as to the back pressure, you must not expect something for nothing. You must not expect to catch the exhaust steam from your engine and conduct it through a system of pipes, large or small, and keep it there until you have extracted all the available heat from it without retarding its escape from the engine. If your engine exhausts into the air the steam expands at or near the end of the exhaust pipe, and immediately falls to atmospheric pressure. But, if you conduct and confine it in a system of pipes for the purpose of extracting and utilizing the heat it contains, you will necessarily retard its expansion and attendant lowering of pressure, thus causing back pressure in the engine cylinder.

The heat is what causes the pressure, and, if you expect the back pressure to be immediately reduced, you must either allow the steam to suddenly expand to atmospheric pressure by giving it absolute freedom, or you must extract the heat suddenly, as is done in condensing engines.

When you exhaust into a dryer the steam comes into hot pipes. These pipes can only dispose of heat as fast as it can be conducted through their iron walls and radiated into the dryer. Everybody knows that iron does not conduct heat perfectly and instantly, else a blacksmith's iron would become as hot at one end as the other.

Time is required, and the cooling and condensation of the steam are retarded by the slow movement of the heat through the iron walls of the pipe and the slow radiation of the heat from the outer surface after it has passed from within the pipe to the outside.

Again, heat passes from a warm body to a cooler one more readily as the difference in their temperature is greater, and as the air within the dryer is heated it will not receive heat from the pipes as readily as if it were cold, nor can the pipes radiate the heat as readily as they could in the outside air.

The fact that the air within the dryer is heated itself tends to retard the radiation of heat from the pipes, and this in turn tends to keep heat in the exhausted steam that is within the pipes, and back pressure is an inevitable consequence. He who hopes to utilize exhaust steam from a high-pressure engine for heating a dryer without causing an appreciable amount of back pressure will surely be disappointed when he attempts it.

In speaking of the great amount of friction there is in small pipes of such lengths as are ordinarily used in dryers he says, "Most of the dryers are made with one-inch pipes, while some builders put in pipes as large as one and a half inch, which comes somewhat nearer what it should be."

Small pipes have more radiating surface for their sectional area than large ones of the same area, and will radiate more heat for the same area.

The writer says that on account of the friction in the small pipes, "High-pressure steam has to be used to fill them properly, hence the back pressure on exhaust steam."

This is a strange state of affairs. Because the dryer is improperly piped and the capacity of the pipes next to the engine is too small to permit of the pipes being filled at the further end live steam is admitted "to fill them," and "back pressure on exhaust steam" is the result. Very naturally, but why not increase the number or pipes near the engine until they will permit the exhaust steam to fill the pipes at the further end? If we must have back pressure, and I claim that we must, it would be better to have it result directly from the exhaust.

It seems to me that it would be difficult to regulate just the amounts of live and exhaust steam that would be most efficient and economical. The use of exhaust steam with an auxiliary amount of live steam to fill the pipes would be a complicated system very difficult of regulation, and I think it much preferable to so arrange the pipes that all filling necessary can be done by exhaust steam and that enough back pressure be introduced and utilized to give the required amount of heat within the dryer. Where steam power is used to drive the machinery I would certainly advise the utilization of the exhaust heat in the dryer if the wares are to be dried artificially.

D. W. STOOKEY.

The Situation in Chicago.

Editor Clay-Worker:

On June 30 the Union Pressed Brick Company began proceedings in the courts against certain brick manufacturers and dealers. On July 29 Judge Dunne granted an injunction for ten days, in which the defendant brick companies will have an opportunity to answer the complaint. The suit, which has attracted much attention in labor and building circles, was based on a bill of complaint filed by the Union Pressed Brick Company, one of the six leading pressed brick manufacturers of the city, the salient allegations of which were:

That by reason of an agreement between four other manufacturers of pressed brick and the members of the Masons' and Builders' Association, which comprises 75 per cent. of the masons and builders of the city, the product of the Union Company had been discriminated against on account of its refusal to join in the agreement to sell the brick for a certain price; that by reason of this agreement the product of the company had been practically driven from the market, as the various bricklayers' unions have refused to lay brick made by others than members of the Masons' and Builders' Association alone, and the Union pressed brick, coming under the ban of the association, is also barred by the workingmen; that the defendant companies—the Chicago Hydraulic Pressed Brick Company, the Cayuga Pressed Brick Company, the Thomas Moulding Company and Charles Bonner—have conspired with the Masons' and Builders' Association to create a monopoly in the manufacture and sale of pressed brick and raise the price of the article $3, which advance is alleged to be divided between the parties to the agreement.

—Defines Right of Contract.—

The bill was presented to the court on the hearing of the demurrer filed by the defendants, technically admitting the allegations of the complaint, but denying the efficiency of an appeal to a court of chancery for relief by injunction. For two days the questions were argued before the court, Attorney Jacob Newman contending for the issuance of the restraining order and Attorney Clarence Darrow appearing for the defendants. It was contended for the defendants that they had the right to enter into the agreement set out in the complaint, declaring their intention to purchase brick from certain parties, and that a court of chancery has no right to restrain by injunction the carrying out of the contract. On this point the language of the court was:

"It is undoubtedly true that an individual or a corporation may enter into a contract to sell its property, merchandise or its labor to certain persons and none others. It is also true that individuals or corporations have the right to refuse to contract with other individuals or corporations. But these propositions are subject to this modification: that in contracting or refusing to contract they do not commit a criminal offense. Where the Legislature, in its wisdom, has seen fit to abridge the right of contracting and declared that certain contracts and combinations are criminal offenses, then such contracts and combinations are without the pale of the law, and, instead of being sustained and carried out by the courts, must receive their condemnation.

—Cites State Anti-Trust Law.—

"The Legislature of the State of Illinois, doubtless having in mind just such combinations as that set out in the bill in this case, passed, in the year 1897, an act making criminal combination of capital, skill or acts by two or more persons, firms or corporations, to create or carry out restrictions in trade or increase the price of merchandise or prevent competition on the sale or purchase of merchandise. Can it be doubted that if the defendants in the case at bar have entered into the arrangements set out in the complainant's bill that the aims, object and natural effect of this combination would be to restrict trade, increase the price of pressed and paving bricks, and to prevent competition in the sale thereof?

"If the effect of the combination set out in the bill is to restrict trade, to increase the price of pressed brick and to prevent competition in the sale thereof, it is a crime, so made by the act of 1897, and, if it be a crime, it is not a contract or combination which any firms, corporations or individuals have the right to enter into."

After reviewing in detail a large number of cases where the courts have passed on the questions raised in the suit, Judge Dunne said:

"It is true that most, if not all, of these cases are ones in which a court of equity gave relief by injunction as against striking workingmen. But if it be the law as against workingmen, why should it not also apply to capitalists?"

—Court Explains the Order.—

An order granting the injunction was entered by the court after mature consideration, and with this explanation:

"If the allegations of the bill are true, as the demurrer admits, the defendants are engaged in the commission of a crime punishable by a fine of not less than $2,000 and a forfeiture of all their corporate rights. In the perpetration of this crime, under the allegations in the bill, they are entailing irreparable financial loss to the complainant. To refuse it relief by injunction and relegate it to a court of common law for the purpose of attempting to ascertain its loss, after its business is ruined, would be denying it the relief which, under every principle of equity, it is entitled to. In the absence of a statute making such agreement criminal the complainant might be, under the older authorities, without remedy, but in view of the plain provision of the anti-trust law of this State and the authorities rendered in jurisdictions where such laws are in force, the right to relieve by injunction is, in the judgment of this court, unquestioned."

So far as is known to me the matter rests where the Judge left it.

—Brickmakers Strike.—

On July 27 all building operations in Chicago began to be tied up through a strike of the union brickmakers of Cook county, when two thousand men, representing the entire working force at the union yards, stopped work. They acted under orders from District Council No. 1 of the National Brickmakers' Alliance. It is a sympathetic strike to force the North Side manufacturers, who employ nonunion labor, to sign the union agreement.

Work on several big buildings in the course of construction was brought to a standstill before the day was over for want of bricks, and no contractor has enough on hand to keep his men at work for more than a day or two longer. The result is that every branch of the building trades is being rapidly affected. If the strike continues for any length of time it is estimated that the 60.000 men connected with the various branches of the Building Trades Council will be out of employment.

—Work Worth $10 000 000 Tied Up.—

Brick construction work aggregating a cost of $10,000,000 will suffer severely. This includes many city contracts, great buildings for private corporations, school buildings, which should be ready by September, and many apartment houses, flat buildings and residences.

Realizing the seriousness of the strike and the enormous interests involved, the contractors and other building interests are attempting to bring about a speedy adjustment. It is thought that some arrangement will be made within a week which will permit work to continue.

The North Side yards, which number about fifteen, have never had union men. The union has tried a number of times to organize the men, but they have refused to pay the $15 fee. Since the union could do nothing with the men, they now demand that the manufacturers employ none but union labor. To make this demand effective, they called for a sympathetic strike in the union yards to cut off the supply of union brick and arranged with the other trades that no union man should work on a building where nonunion brick were used. In this way it is thought that the North Side men will find no sale for their bricks and have to sign the union agreement.

Both the union and nonunion manufacturers are members of the Chicago Brick Manufacturers' Association, and it is claimed by the strikers that, while they are standing together in this fight, the union men are making for organization on the North Side. As an evidence of this, they say that the South Side manufacturers refuse to deliver brick at any price to the North Side. This the South Side manufacturers deny. The strikers agree that they have no grievance against their employers, but are out in accordance with the section in their agreement with their employers which states that they may go out on a sympathetic strike.

There seems to be but one object on the part of the strikers: that of forcing the nonunion men working in the North Side yards into a union. It is not claimed that there is any other issue. There seems to be much regret expressed by men belonging to other unions, whose earning capacity has been stopped, that at this time, when work and wages are satisfactory, a strike should have been ordered and carried into effect.

For several days past—in fact, from the day the strike began—there have been expectations on the part of many that there would soon be a settlement. The daily press has told us from day to day that the strike would be settled "to-morrow," but each succeeding day has found it apparently as far from settlement as ever.

On the 9th the Brickmakers' Alliance presented an agreement—a result of the conference between them and the Building Trades Council—to the manufacturers, but it was too broad to suit them, and they refused to sign it. This proposition asked that the manufacturers agree to furnish union-made brick for any job in Cook county, at market price and according to demand, first ordered first served, and that the union-made brick have the label of the National Brickmakers' Alliance and be delivered only to jobs employing union labor.

The manufacturers are averse to allowing their employes to dictate concerning the sale of brick, and it does not seem likely that any settlement can come along these lines. Where it will end no one can tell.

X. Y. Z.

Chicago, Aug. 10, 1899.

Good Place to Establish a Tile Factory.

Editor Clay-Worker:

I would like to take measures to interest a tilemaker in this locality to induce him to settle here. We have a clay county, wet and spouty, and every acre needs underdraining. The farmers cannot procure tile here without great expense for freight, as there is no tile or brick factory near. If a tilemaker will come here the farmers will be glad to buy from him. Good clay is abundant here, and we are on a railroad, so the surplus can be shipped. There is a good college here, where the manufacturer can educate his children. I hope you may be able to induce a tilemaker to settle here. I will gladly answer all letters of inquiry inclosing a stamp.

New Wilmington, Pa. J. C. M. JOHNSTON.

Cleveland Building News.

Editor Clay-Worker:

Supplementing the article of "Occidental," of Cleveland, O., in the June number of The Clay-Worker pertaining to the brick industry, several long articles of interest to the readers of The Clay-Worker could be written. The many streets being paved with vitrified brick, the number, quality and where made, contract prices, etc., would require many pages; also, the number of apartment houses of brick, with descriptions of their modern inside arrangements and illustrations of the outside, would further rivet the attention of those not so well favored as to be able to inspect them personally. The appearance and construction of the sky-scraping business blocks, with brick, terra cotta and artificial stone fronts, in which this city excels, would further elicit interest.

Regaring artificial stone, which, in some respects, is nothing more than cement work, made of imported cement and carefully selected home material, I will give further information. It was developed and gradually introduced by a sculptor and graduate of the Academy of Arts at Munich, Germany. At first only ventures were made on window caps and cornices. Then the park commissioners ordered fountains for several parks, of which a mythological marine group for the center of the lake in Wade Park has attraced much favorable attention during the last eight years. The enduring qualities of the material having thus been established, it is now used for very expensive buildings, such as the De Cline apartment block on Euclid avenue and a Congregational Church on Pain avenue, in which the stonework is of this artificial material.

The advantages claimed are that, first, it can be produced very rapidly; second, it costs much less than stone; third, it can be made very ornamental at less than one-third the cost of carved stone; fourth, any color of stone can be produced; fifth, it is claimed not to tarnish as quickly as natural stone or even terra cotta; sixth, the ornamental parts are in solid block, and need no filing in behind the terra cotta; seventh, all blocks are perfectly uniform, no uneven shrinkage; eighth, it is said to endure this climate better than natural stone.

With all these advantages, it looks as if this material would become a great competitor with terra cotta. Here in Cleveland it is superseding ornamental carvings in stone more and more every year. I attribute the success of this artificial building material more to the careful selection of the ingredients by the plodding manipulator, his chemical knowledge and scientific education and thorough understanding of architectural ornamentique.

The 80,000 brick plant "Occidental" mentioned in course of erection here has not materialized yet. It may be that the street-car strike keeps it back. We enjoy the full force of this labor trust now. Anarchy and riot has been the order of the day. With a full force of police and militia we hope soon to see peace reigning once more in our midst. With the better class of citizens the strike is very unpopular. Besides, it is al' over. The Big Consolidated Street Railway Company has enough new men to operate their lines. All they need is protection, which is finally being secured. This is another instance where a trust governed by unskillful hands comes to grief.

MASTER MECHANIC.

Cleveland, O., Aug. 9, 1899.

Tile Roofs the Best of All Roofs.

Editor Clay-Worker:

The writer is thankful for your criticism of his letter, "About Roofing Tile," in the June number. We acknowledge that we should not have said in regard to shingle tile "the only advantage they have over slate is the color," for it contradicts what we have previously said. In the same letter you may read, "It has an advantage over slate in being more refractory of heat, of less weight per square, and having a great variety of forms of a more pleasing color," and on page 108 of the August, 1896 issue you will find that the writer has represented eight different forms of shingle tile. Let us enumerate their advantages over slate:

First—As you state, they resist the action of fire to a greater degree.

Second—They can be shaped, at little expense, into all the forms we have represented.

Third—They refract heat to a greater degree, making a house cooler in summer.

Fourth—They can be made in any color desired.

The principal objection to a shingle tile is that it is plain like a slate, and, like a slate, is fastened to the roof by nails. When a man builds a new house and has it well slated he is disposed to say, "I have a house the roof of which will last at least a lifetime." In a few years he is surprised to find that his slate roof needs frequent repairing, because the nails have rusted or broken. The roofs which have lasted for centuries are not shingle tile roofs. Let us not have a material which will last for ages depend upon such a perishable thing as an iron nail. How long will a nail in a porous shingle tile last? Certainly a vitrified tile protects a nail from rust to a greater degree. Every tile, shingle as well as interlocking, should have nibs to support it that bear on the upper end of the tile below.

While a shingle tile is the lightest form of tile it makes the heaviest roof. Impressed with the importance of these objections to the shingle tile we made the statement for which we are criticised. We acknowledge the justness of your criticism, but the objections still remain. No tile is good for anything when the means which held it in position has failed. Your comments in regard to the difficulty of introducing tile in northern Europe make no issue between us. They have been overcome, but that they did exist is unquestionable. Permit me to refer your readers to page 340, August, 1898, issue of your journal, in which this matter is considered. Let me repeat, "We consider a tile roof the best of all roofs for any building and for any climate," and add, whether it be a shingle tile roof or an interlocking tile roof, but we hope you will pardon us for not being enthusiastic over a form of tile which depends for its utility on a nail. We are reminded of the words of that solemn hymn:

"Behold on what a slender thread
Hang everlasting things."

GEO. S. TIFFANY.

THE OLDEST BRICK IN EXISTENCE.

At one of the recent meetings of the Academy des Inscriptons et Belles-Lettres, in Paris, the keeper of the Louvre, Mr. Henzey, showed a brick which is undoubtedly the oldest in existence, dating, it is estimated, from the fortieth century, B. C. The brick in question was discovered by the French savant and antiquarian, de Sarzee, during recent excavations at Tello, the ancient Sirpulo in Chaldea.

The brick was somewhat curved, and had been baked, but was of such crude form that it evidently had neither been put in a press nor molded. The mark of the maker was simply the imprint of the thumb. It was clearly made very soon after the discovery of the art of brickmaking, which art, as is universally admitted, marks the dawn of civilization.

Other bricks of a much more recent date were shown. Some of them bore the mark of the coat of arms of Sirpulo, an eagle with the head of a lion. Others again were inscribed with the name of the reigning monarch.—Exchange.

Written for the CLAY-WORKER.

THE NEW YORK BRICK MARKET.

JULY HAS NOT KEPT the record of good brickmaking weather intact as did the preceding months of May and June. More rain and overcast weather, with the celebration of the national holiday by a large number of the Irish laborers, has affected the output some.

The Irishman was once, and I might say is now, the best all-around brickyarder, when you find one that does not drink, but, like the buffalo, he is nearly extinct.

If the yards had to depend on that class of labor there would be a brick famine in a short time. They have gradually been going down hill, and at the present time they are "no good," except to put in as much time drinking as they possibly can. The present season calls for steady labor, and the number of men on the loaf after pay day, which comes every two weeks, is a surprise even to those who have been acquainted with that class of labor for years. It would seem as if all the broken down "hacks" from all over the country had come this way. As I write there are four of them passing my door with a pail. They will find a shady place, then send to the saloon for beer from time to time during the day. Others will join them until there will be enough men gathered together to run a yard. It is always hard work for three days after pay day to get enough men to run the machines, to say nothing of men to load boats or set brick. Some may ask, "Why do the bosses employ them?" Anything in the shape of a man is in demand the present season, as labor is scarce.

Other classes of labor, such as Huns, Poles and negroes, are but a trifle better. For a few years they are good, steady workers, so that one could depend on them to be at work Monday morning, but there seems to be something about brickyard work that leads men to drink. If some of the old-time brickmakers could return and see the class of men employed, as well as the different nationalities represented, they would think that a confusion of tongues had taken place Italians, Polocks, Greeks, Arabs, Irish, Huns and negroes are to be found on some of the yards, and, by the looks of things, there will have to be a school established for the purpose of educating the foremen in the different languages now in use, as he is the man who has the hardest task of all, and is not overburdened with patience. He will talk to an Arab both with his hands and mouth, telling him what to do, and then expect him to go do the work as told, only to find that the man has paid no attention to him, and, if he had, would probably be no wiser. If the foreman did the drinking it would not be so much of a surprise, as he has cause every day to drown his troubles in drink.

—Long Hours of Labor—

Is the cry now set up that causes all the trouble. It would appear that anyone making the claim had not given the matter any thought. Think of the hours in past years, when the men worked from sunrise until the stars were in the sky, and drunkenness was unknown, compared to the present day. If the same hours were in vogue now it would be an advantage in keeping men from the saloon, if nothing more. But the day when such methods were in practice is past.

It is believed that the hardest of all work is generally the portion of the men who labor on brickyards. When one not connected with the trade hears that the hours on the brickyard are from sunrise to sunset he takes it for granted that the men work all those long hours. How many of them work even half that time? There is a class which works while others sleep, and that is the Italian truckers who hack brick.

Morning after morning the past summer I have heard the men going past my house at 3 o'clock, so they would get their share of brick before the machine started. When the pit is out he is all through and goes home. Does that make the work hard? Far from it. He does his work in the cool of the morning, and, as the pit is out at 10 o'clock, he can rest and make up for the lost sleep. The men who fill and level the pits are through by noon, and work no more that day Is he overworked? If so, could man and horse stand it day after day? The brick wheelers must have a stint or they will not work, and they are through by noon. If they are worked so hard as some try to make us believe, saying it is a shame to work men so hard, could they stand it? Yet they get fat on it, for they have a long rest all afternoon.

There is no denying the fact that there is one part that is hard work, and it lasts the full complement of hours, from sunrise to sunset or to 6 p. m., and that is the loading of the boats. To-day, with the use of the barge, there is no sitting on your barrow handles, but one steady go from kiln to boat and back again to kiln. The wheeler need not attempt to loaf, as he will be called to time by all the men. To keep this gait up for two days is work indeed, but it does not occur oftener than three times a month, so that the laborer's part is not day after day. Some claim that the reason the brickyard hands drink is in order to keep up their strength. This argument might hold good if it was a case of hard work from early to late, day after day, but, as I have just shown, it is not.

The wages paid would be low for long hours, but, for the actual time the men work, their pay will compare with any other line of work. Some men will leave other work and work on the yards, so that they can get through by noon.

This season they get about twenty cents per day per man more than last year, which makes quite an advance in the cost of the brick.

—The Future of the Brick Business—

As regards labor is hard to forecast. It gets worse from year to year, if such a thing is possible. As before mentioned, all kinds of men are employed, with no hope of getting any better, as the competition is strong in reducing the price of the increased output. The Italian would be the best substitute, except he is rather small, and, when it comes to wheeling the burned brick, he is not "in it," except in rare cases. Some would have us believe that a ten-hour system would bring a desirable class, but it does not seem possible.

New masters make new laws, so the yards may be operated on another scale and a fair return may be had at all times. If it were possible to change from open to steam drying, it might bring a better class and naturally a steadier class of men, since they would be required to be on hand every day. If the manufacturers of the future have any more trouble to keep a gang of men than the manufacturers of to-day they will have a hard road to travel.

—Harvest Time—

For the brickmaker is the present, and the manufacturers have tried to turn out all the stock they could. In the early part of the season labor was plenty. At present men are hard to get. The times may take a turn any day, as that fickle maiden, "Money," may become "tight" and retard the speculative movement now in progress.

The brickmakers quote the numbers of new buildings now in course of construction and those that will be erected later, and say this beats the record, and seem to think this is way beyond other years. For the first six months it was. How it will hold out is a question yet to be determined.

Six months, to June, 1899, number of buildings, 2,622; cost, $67,052,391.

Six months, to June, 1898, number of buildings, 1,747; cost, $38,253,350.

Six months, to June, 1897, number of buildings, 2,018; cost, $50,527,185.

Six months, to June, 1896, number of buildings, 1,965; cost, $46,973,610.

Six months, to June, 1895, number of buildings, 2,562; cost, $59,201,804.

Six months, to June, 1894, number of buildings, 1,297; cost, $27,779,160.

The figures show that 1895 was a close second to the present year. You will notice that we are 60 permits ahead of 1895. In the matter of cost the figures show in favor of 1899, as there is $7,850,587 to be credited to the 60 extra buildings.

The following figures are for the borough of Brooklyn:

Total number permits, six months, 1899, 2,355; cost, $11,535,664.

Total number permits, six months, 1898, 1,790; cost, $7,037,837.

In number of permits, 1899 leads by 565. But the difference in cost, $4,497,827, spread out over 565 buildings, goes to show that the class of buildings being put up in Brooklyn are not costly ones.

To go still further, we find that the permits for the past six months call for 1,050 brick structures and 1,305 frame structures. For the same length of time of 1898 it was for 684 brick and 1,106 frame structures. The cost represented is about one-sixth of that of New York, so that Brooklyn does not make much of a showing. Still, I suppose we must be thankful for small favors.

—The Fall in Price—

Of brick, in the face of the above figures, is a matter that calls for an explanation, and last year could be explained by the great cry of some who sell the red cubes, by the simple process of supply and demand. They will tell you, if the manufacturers will not ship, but keep their stock under the shed, the market will surely react. Last season the largest factories in the trade kept their stock under the shed, but the market did not respond to the short supply. What kept the price down? Echo answers, "What?" The cause given was want of demand. This season they can't say it is "want of demand." When the market takes all that comes in and keeps the market clear, certainly the demand must be equal to the supply, if not a little better. But the tendency is downward—still downward. Why is it? I think it calls for a master hand to take hold of the trade and place it where it will not be like a football—literally kicked about. The present summer has shown more barges of brick in the market than ever before. In one week nearly one hundred barges reported their cargoes sold and taken off the market, leaving it clear. And still the price is down. Surely, with such a condition existing, the price should be steady. If it were peanuts or watermelons the price would go up so quick that it would be a serious matter to look at a melon or a bag of peanuts. But, with brick, it seems that some unseen or unknown power favors the buyer. He seems to know what is likely to come on the market, and so regulates his purchase, and the manufacturer—"he pays the freight," as many have found to their sorrow.

In the face of all this the freight on brick is raised. Queer things happen in Queer street, and any one who gives the matter a serious thought will be all at sea in regard to the brick trade of 1899. It is certainly a manufacturer's year; still the buyer is reaping the benefit.

Elevators were put in this spring in two of the yards. They were the only sod pit yards here, and thought it would be an improvement. Of course, they can soak the clay better and for a longer time than by the old method, but, by building two pits to each machine, the same results would be reached, as far as the soaking is concerned. One of the parties informed me recently that the elevator did not come up to his expectations.

—The Market—

Is taking stock as fast as shipped. What more can one want, except the price received for brick, which should be a $6 one at the lowest? Instead they seem to be trying to get below the $5 mark. If luck or some other power favors them they will reach it. I give it up. There may be some who can name the figure, but they won't tell. The prices for hards range from $5, $5.25 to $5.50; pale, $2 to $3. A. N. OLDTIMER.

TRADE NOTES.

William F. Scott, the genial secretary and treasurer of the Fernholtz Brick Machinery Co., of St. Louis, Mo., writes that their business is steadily increasing, and their prospects are very bright. They have recently shipped a complete outfit, including a two-mold press, to the English Mining and Manufacturing Co., Jackson, Mo., and a similar equipment to J. R. Copeland, Birmingham, Ala. Mr. Scott says they now have, among others, an order on hand for a large dry press brick plant in Old Mexico.

The Atlas Bolt and Screw Co., Cleveland, Ohio, manufacturers of clay cars of all kinds, turn tables, etc., report a constantly increasing volume of business. Brickmakers are evidently learning that their dryer cars are good things, easily pushed along. Their sales already largely exceed those of last year, 1899 will evidently be a record breaker. S. D. Wright, the superintendent of their car department, takes a rosy view of the business situation and life in general, as he ought to for he has just returned from abroad where he went on a wedding trip.

Warren county, Illinois, which has already more miles of brick country roads than any county in the State, has just let the contract for 4,500 feet of road which will have a center of brick nine feet wide, with three feet of crushed stone on each side, making a roadway fifteen feet wide The contract was let for $3,329.20, but the commissioners will do the grading, which will be extra. The road lies along the east line of the city of Monmouth. The center of the road will be composed of brick blocks 3½x4x9 inches. They will be laid in a four-inch bed of sand. Monmouth township now has nearly seven miles of crushed stone road, and the taxpayers are satisfied with the experiment.

Hiram Raphael, an ex-convict, according to the Macon, Ga., papers, has sued the Chattahoochee Brick Co. of Atlanta, Ga., his former lessees, for $500.50, which he alleges is due him for work which that corporation compelled him to execute on the Sabbath day during his imprisonment. Raphael's sentence extended from September, 1895, to June, 1899, and in that time he claims to have worked 197 Sundays, which, computed at $1.50 per day, and added to which is $5 due for a suit of clothes, to which every discharged convict is entitled, makes up the amount sued for. It is set forth in his petition that lessees can't lawfully force convicts to work on the Lord's day, and the plaintiff bases his cause on this assertion. The case is being watched with much interest.

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CURRENT COMMENT.

While there is no pronounced building boom, the demand for building brick throughout the United States is sufficient to keep all the yards going full handed. Barring labor troubles, the season will be both a busy and prosperous one.

* * *

Unfortunately, strikes and rumors of strikes burden the air. There seems to be a marked tendency on the part of labor to indulge in controversy over trivial details, which in a number of cases has already led to serious trouble. It is the only fly in the trade ointment now.

* * *

The most formidable strike in the building line is that now in progress at Chicago, where a factional or sectional strife between the employes of the North and South side yards threatens to stop all building operations in the Windy City The situation is grave. All the principal yards have shut down, and, while the papers daily announce that a settlement has been reached, the workmen remain idle, entailing a great loss alike to the employers and employes.

* * *

The question of wages is not involved, we are told, but, as in the great street-car strike in Cleveland, the men are seeking redress for some fancied slight or the recognition to which they think their unions are entitled. It is a great pity that such differences cannot be adjusted in an amicable and sensible way, without resorting to such drastic and costly measures as strikes and lockouts, which almost invariably result in seriously crippling the participants and works serious injury to the public.

* * *

"We are not looking for any more orders, for we now have all we can possibly swing until snow flies. Have not had such a demand for pavers since 1892," writes J. L. Higley & Co., the well-known paving brick manufacturers of Canton, O. A very happy condition that, and most all of the paving brick manufacturers are in the same fix. There is a great and growing demand for vitrified paving brick in every section of the country. North, South, East and West brick streets are steadily growing in favor, insuring a stable market for years to come.

BRIDGES OF BRICK.

During recent years the question of making bridges, for wide driveways in cities, of material other than steel has been one of considerable discussion and interest. The same problem is now before several cities in this part of the country. The idea is to get a decorative bridge, one of more artistic merit than the ordinary steel structure. Why not make the arches of these structures of brick? Brick bridges have been in use in other parts of the world for hundreds of years, and were made of material certainly inferior to the best now used for ordinary structural purposes by us.

TRUSTS AND BRICKMAKERS.

A "Regular Reader" finds fault with what we said in the July Clay-Worker about trusts and brickmakers, intimating that we cater to the large concerns and not to the small ones. Such is not the case. We believe in doing business in a way which will bring the greatest amount of individual effort and freedom. That certainly does not come through trust organization, as we have previously stated. We do not believe that the brick business is one that can be consolidated. With present technical knowledge so widely spread, with so many makers of machinery, with clay so abundant and transportation facilities so great, there is an opportunity for individual freedom of action greater than in other industries where immense plants and great capital are required. But it makes no difference what we think about trusts or consolidations. In many lines of business trust is a fact. In many more it is but a bugaboo.

BRICK AND ASPHALT PAVEMENTS.

Something more than a year ago we called attention to a new pavement which was being laid in this city. There was brick between the street railway tracks and for a short distance on each side, and brick in the gutters, with the intervening space filled with asphalt. We stated at that time that the brick used between the tracks were not well laid, and that the brick in the gutters were being laid in an ideal way. In the case of the former the brick were being laid loose, on a sand bed, and in the gutters they were being laid upon a Portland cement bed, grouted between with cement, and laid level and true. In this instance we had a brick covering where asphalt has proved notably a failure. Even with the brick laid carelessly as they were between the tracks, it has served much better than where asphalt has been placed in the same situation, and the brick paved gutter is in absolutely perfect condition. It will outwear many asphalt pavements.

WANTED, ARTISTICALLY DESIGNED ORNAMENTAL BRICK.

The quality of technical excellence in brickmaking has reached a high state of perfection. The quality of color has very greatly advanced during recent years. Color effects are now produced not dreamed of a decade ago. Artistic forms have not advanced in any way commensurate with the technical and color advances. In the making of terra cotta the question of artistic merit has been dependent very largely upon those who made the original drawings, and has not been allied with craftsmanship. Many of our modelers in terra cotta are merely dextrous. But in the matter of brickmaking the artistic expression which comes through form has made little or no progress during the last ten years, and is not to be compared with the work of earlier centuries. The artistic possibilities of brickmaking are hardly to be estimated, as no serious effort.

excepting in a limited way, has been made to develop its possibilities. Most of the forms given ornamental brick are crude and uninteresting, and variety in their production is small indeed. The time must come when those interested in educational work connected with brickmaking must give the same earnest and serious consideration to the artistic side which it has been giving and is giving to the technical perfection of clay material. The best results from the standpoint of technique are discounted when the artistic element is not properly considered. As it is, those interested in the artistic side of clayworking and those in technical clayworking are living in different camps, and occasionally some one throws an arrow and without cause. Both are wrong and both are right. What they should do is to move together and join interests.

EX-PRESIDENT EGGERS' BRICK PLANT BURNED.

We are in receipt of a communication from F. H. Eggers, of Cleveland, O., the well-known ex-president of the N. B. M. A., telling of a distastrous fire which visited his brick works at midnight of the 14th inst. The fire, which is supposed to have been caused by sparks from a burning kiln, started in the main building, and spread so rapidly that in a short time all the buildings containing the machinery, appliances, etc., were in ruins. Mr. Eggers estimates his loss at from $25,000 to $27,000, on which there is about $10,000 insurance. At the time of writing he was making preparations to rebuild.

FIRE TESTS.

One of the most energetic organizations for public good is the British Fire Prevention Committee, an organization of engineers, architects, builders and capitalists who have taken up seriously the question of the prevention of fire. Their pamphlets now number twenty. The last three have to do with tests of floors, of ceilings and tests with glazing. It is serious, unprejudiced work of this character which will bring to the minds of the people the best method of building. Their work is carefully done, and the results without question. We have referred to these tests before, which have dealt with columns, theater exits, fire departments, tall buildings, etc. In no instance has burned clay suffered at the hands of the committee.

VITRIFIED BRICK TAKES THE PLACE OF ASPHALT IN CHATTANOOGA.

After canvassing the matter thoroughly the Chattanooga Board of Public Works have decided to resurface Market street, the principal business thoroughfare of that city, with vitrified brick, and the contract has been let to the Tennessee Paving Brick Co.

Market street was laid with asphalt eight years ago by the Warren-Scharf Asphalt Co. Repairs were made on the street after the third year, and during the past year or two the street has become so much worn that it is now necessary to repave it. That the city authorities have decided to put down brick is considered quite a victory over the asphalt combine. The Warren-Scharf people considered the job of sufficient importance to send their vice president, Major Whinnery, of Chattanooga, to look after their interests, and he remained there three weeks endeavoring to secure the contract, but failed.

About the same time that Market street was originally paved with asphalt several other streets were paved with brick. The latter are now in good condition, having required no repairs whatever, nor do they seem likely to for some years to come. It is not strange, therefore, that brick now takes the place of asphalt. Whenever the asphalt people have supplanted brick with their material they have taken pains to see that the world was advised of the fact. However, it is not likely that they they will advertise the Market street job. Chattanooga has been one of their "show" places in the South, and Market street was considered one of the heaviest and best pavements made by the Warren-Scharf Company.

Chattanooga has a number of good brick streets. The first was laid in 1890, and others in 1891 and 1892. All of these pavements are now in good condition. All were laid in concrete beds and under a five-year guarantee, which expired without the contractors being asked to make any repairs. This speaks well for the contractors, the Southern Construction Co., who put down the brick, and for the Tennessee Paving Brick Co. as well, as that company furnished nearly all of the brick for these streets.

PROSPERITY IN THE GAS BELT.

Business of all kinds is booming in the Indiana gas belt. The brickmakers are all very busy. A number of new plants are being built, and still others will follow. One of the latest to get under way is that of John F. Rodefer, of Elwood, Ind., which began making brick Aug. 10. Though all the machinery was new they started off at a 30,000 a day clip. The plant is equipped with an extra heavy Quaker machine, Woolley dry pan and the Mock system of rack and pallet drying, all erected under the supervision of James H. Hensley, of Indianapolis, who predicts that it will prove one of the most successful plants in the gas belt.

VEEDERSBURG SMALL BUT ENTERPRISING.

The town of Veedersburg is not metropolitan in size, but is progressive, just the same, and proposes to pave its principal streets with the best vitrified paving brick. Bids will be received by the trustees of the town, Friday, Sept. 8. Those desiring full particulars are requested to address I. J. Walker, town clerk. It is an easy guess that the Wabash Clay Co. will furnish the brick. At any rate they ought to, for their brick are the equal of any in the country, and, being a Veedersburg enterprise, they deserve the business. It is shortsighted not to patronize home industries when they offer material as good as the best.

A LARGE DEMAND FOR BRICK.

In every section of the country there has been a material advance in prices. This is brought about, brickmakers tell us, not by the demand for large structures or from immense paving contracts, but from a healthy demand from small contractors. The brickmakers in a large market recently said to us that they were crowded with small orders—those ranging from 25,000 to 200,000. One large manufacturer said he had to refuse orders. While going about the State a traveling salesman remarked, "One does not notice many large structures, but in every town there are being built one or two stores, a few good houses, frequently a church, a school building or an addition to a manufacturing plant, so that in the aggregate there is in reality a large demand for brick." A multitude of small orders are keeping our manufacturers busy.

CHEAP BRICK PAVING.

For reasons influenced by first cost, not economy, many brick pavements will have to be laid on sand foundations or on inadequate beds of concrete. In a town not used to good pavements, in one not educated to the point of constructing the best, and where the best is not appreciated, cheap brick pavements will have to be laid. People ought to have what they are willing to pay for, and it is expected that, when demanded, the brickmaker will furnish cheap brick, and that they will be laid in a cheap way. We have in mind a pavement in this city which has been taken up and relaid three times within recent years. The street is a narrow and heavily traveled one. The last effort was finished a few days ago, and the same mistake was made. It was relaid on a sand bed. Adjacent property owners are educated, however, and this will not happen again. The character of the foundation has a great deal to do with the life of any pavement.

Written for The Clay-Worker.

WHERE THE BRICKYARD STOOD.

A Dirge of the Days Gone By.

I passed the wood where the brickyard stood
When I was a boy, of ten,
And the golden glow of the long ago
Shone over me once again.
I turned the lane where the sweet refrain
Of the work in the whitening clay
Oft drew me near, and I paused to hear
The hymn of a busy day.
It was years ago, but I waited now
For the sounds that had pleased me then;
For the kiln fire's song as it crackled along
With the hum of machines and men,
And the regular beat of the sweep horse's feet,
And the clack of the busy mold.
And the joyous laugh, full longer by half
Than the story of which it told.
And above them all, like the robin's call,
To the tune of the rippling rill.
A quaint, sweet air from a whistler there,
As he busily built his kiln.
Then the joyous shout when the tread was out,
And the day's hard stint was done,
And stalwart men became boys again
And joined in my boyish fun.

But I waited in vain for the sweet refrain,
And in vain for a form I'd know,
For the place was bare, and the forms once there
Had vanished years ago.
The grass grew green where the kilns had been
(For the whistler's work was done),
And clover sweet where the willing feet
Had toiled in the blazing sun,
Growing green and high, till the anxious eye
Saw nothing it sought to find,
Save the slope of the hill where the tread was filled,
Where daisies nod in the wind.
On the level ground where the sweep went round
At the striker's cheery cry—
A skeleton bare was standing there,
The ghost of the days gone by,
Keeping silent guard by the old brickyard,
Defying the gathering green;
Fit monument of the days well spent—
The wreck of a brick machine.

"They have gone away; there is naught to say,"
It answered me, soft and low.
"It is many a year since I saw them here.
Where are they? I do not know.
They say some sleep in the billows deep,
By the guns that they manned in life,
While others lie 'neath the Southern sky,
Where they fell in a dreadful strife,
And some remain to a life of pain,
Disabled by shot and shell;
And I've heard it said 'twas brickmakers led
The charge through the jaws of hell.
It may be true, yet how strange 'tis, too—
(Such gentle hearts were they!)—
They offered their life in an awful strife
And led in its bloodiest fray.
Brave, simple men! I remember when
The cowards, who stayed at home,
Used to scoff and sneer at them, working here
In the mud ere the call had come."

They have gone away, and what need to say
That they're missed where they used to be,
For the very sod where their feet once trod
Grows green with their memory.
Beyond the town, where the stream falls down
To the shade of the crumbling mill,
There are those who sleep; they no longer weep
In the desolate cots on the hill.
One low, green mound in that burial ground,
Where it faces the glowing west,
Bears a graven stone, with the moss o'ergrown,
Where the whistler lies, at rest.
They are gone away, but what need to say
That the place where they labored then
Notes their absence still, and mourns, and will,
The loss of its noble men.
By the green-grown flat where the kiln once sat,
By the soil which their toil had blest,
By the limpid pool where in evening cool
They laved ere they went to rest,
At night, full oft, comes a requiem soft
For those friends of the days gone by,
While the grasses bow to the west wind low
Or the south wind's mournful sigh.

And the voices of spring come sorrowing
When the warm, bright day is o'er,
And the fading light tells of coming night
And of those who will come no more.
But I alone neither sigh nor moan,
For I stand for heroic men,
Who scorned not work and who did not shirk
When freedom had need of them;
Whose record stands in the work of their hands,
That builded the cities' walls;
And a Nation, saved by the blood they gave,
Which shall stand till the angel calls.

* * * * * *

On the level ground where the sweep went round
At the striker's cheery cry,
A skeleton bare is standing there,
The ghost of the days gone by,
Keeping silent guard by the old brickyard.
Defying the gathering green,
Fit monument of the lives well spent—
The wreck of a brick machine.

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FOR SALE — One No. 8 Brewer brick machine; one "Old Reliable" brick machine; three dozen new molds; all as good as new. Address W. P. DUNN,
8 1 d Crowley, La.

Books for...

Brickmakers.

"CLAY GLAZES AND ENAMELS,"	Henry R. Griffen, C. E.	$ 5.00
"BRICKMAKER'S MANUAL,"	Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	J. J. W. Billingsley,	1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

RAYMOND

BRICK MACHINERY

Where it is Used.

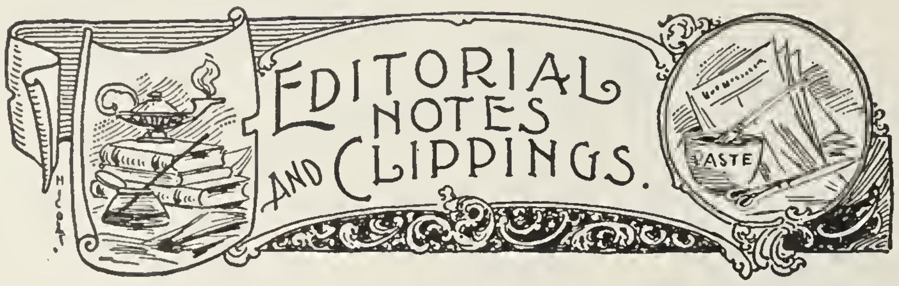
In answer to many inquiries as to where our Machinery can be seen in operation, we submit the above diagram.

RAYMOND BRICK MACHINERY is now used and in daily operation the world over. ⁂ Place your finger on the map and you are almost sure to place it upon a Raymond Brick Machine. ⁂ ⁂

Our great success has not been obtained without merit. ⁂ ⁂ Buy Raymond's and you get the best.

⁂

C. W. RAYMOND & CO.
DAYTON, OHIO, U. S. A.



EDITORIAL NOTES AND CLIPPINGS.

Thomas George has purchased land at Cheyenne, Wyo., and will open up a brickyard.

H. V. Bailey has purchased the brick plant at Mason, O., formerly owned by George Bauer.

Geo. M. Weaver's Sons sustained a loss of $500 by fire at their brickyard at Utica, N. Y., recently.

The Newman brick plant at Des Moines, Ia., which has been idle for a year or more, will be started up soon.

The Arkansas Brick and Manufacturing Co., Little Rock, Ark., will enlarge their plant and put in some new machinery.

In a recent letter J. D. Pratt, of Marshfield, Wis., says his trade this year is splendid; in fact, he cannot supply the demand.

The Sargent Brick Co. has been incorporated to manufacture brick at Painesville, O. They have a capital stock of $10,000.

George T. Jacobs, 205 Eighth avenue N. E., Washington, D. C., contemplates establishing a brick factory in that immediate vicinity.

Three men were instantly killed by the caving in of a clay bank at the plant of the Buckeye Sewer-Pipe Works at Akron, O., July 22.

J. J. Crawford, of Nashville, Tenn., is investigating the manufacture of shale paving brick with a view of locating a plant at Nashville.

Among recent contracts booked by the Purington Paving Brick Co. at Galesburg, Ill., is one for 1,500,000 pavers from Lincoln, Neb.

W. H. Craig, of Scotland, Pa., announces that a brick and tile factory will soon be in operation in that village, turning out white brick.

The Suffolk (Va.) Clay Co. has been organized to manufacture brick, both building and paving. H. L. Jacobs is general manager for the new concern.

B. Waggener will erect a new brick plant at Atchison, Kan. He has had the clay tested, and it has been demonstrated that a fine pressed brick can be made.

John Vinton Dahlgren, the president of the New York and Pennsylvania Brick, Tile and Terra Cotta Co., New York city, died at Colorado Springs, Col., Aug. 10.

J. W. Dimock and D. W. Humphrey, of Carbondale, Pa., own a fine bed of clay at that point. They contemplate establishing a brick plant of 40,000 daily capacity.

The Clinton (Ind.) Paving and Building Brick Co. write that their trade up to the present time has been fine, and the outlook is very good for the balance of the year.

The Damon Brick Co., at Still River, Mass., has recently made a number of improvements at their plant, among other things putting in a new Wiles brick machine.

R. R. Abrams writes that he contemplates starting a fire brick plant at Monongahela, Pa. He accordingly wants The Clay-Worker, he says, as he "wants to get posted."

The Reese-Hammond Fire Brick Co. has purchased the plant of the Glade Fire Brick Co. at Nuzuma, W. Va. They will enlarge the plant, increasing the capacity form 16,000 to 60,000 brick per day.

The Cass City (Mich.) Brick and Tile Co. will locate their new plant south of the town. Most of the machinery has been purchased, and they hope to have everything in good running order before long.

F. M. Warner has started a new brickyard at Farmington, Mich. He starts out with orders for 3,000,000, and, as the nearest brickyard is six miles away, there is no question about the continuance of his orders.

Farmers should read the "Western Trail," published quarterly by the Chicago, Rock Island & Pacific Railway. Sent free for one year. Address at once, by letter or postal card, John Sebastian, G. P. A., Chicago.

The Canton and Osnaburg Brick and Tile Co. has been incorporated to manufacture hollow blocks, brick and tile. The principal office of the company will be at Newark, N. J. They have a capital stock of $100,000.

A. R. Williams has purchased an interest in the Halton tile factory at Perrysburg, O., which has been operated for some time under the firm name of Knowles & Gilbert. The new firm will be Williams & Knowles.

William R. Poate and his son Percy both died at their home in Hattiesburg, Miss., July 20, after a long illness with typhoid fever. Mr Poate was a brick manufacturer, and had formerly been engaged in the brick business at Slidell, La.

Sparks from a passing engine caused a big blaze in the yards of the Chattahoochie Brick Co. at Atlanta, Ga., and before the flames could be extinguished six kiln sheds and the dryer were destroyed. The loss is estimated at $1,500.

Thomas P. Bonfield has sold his tile and brickyard at St. Anne, Ill., to William A. Miller, of Chicago. Mr. Miller is an experienced brick manufacturer, and will operate the plant, which has been idle some time, on an extensive scale.

A company has been organized at Mexico City, Mexico, to establish a fine brick plant at Cuernavaca. Col. J. H. Hampson, Ignacio Sarmina and Ramon Oliverez are the principal stockholders. The capital stock of the company is $100,000.

As will be seen by Mr. J. C. M. Johnston's letter in our correspondence columns, there is a good opening at New Wilmington, Pa., for an energetic tile manufacturer. Any one interested will do well to write Mr. Johnston for particulars at once.

The N. U. Walker Sewer-Pipe Co., East Liverpool, O., have started up one of their factories, after an idleness of four or five years. A full force of men have been put to work, and the company can scarcely meet the demand for their product.

Peter Fewson, an old-time brickmaker of Lenox, Ia., died at his home in that city the 30th ult., after an illness of but two weeks. Mr. Fewson was born in Canada in 1846, but had resided in Lenox since 1877. He leaves a widow and one son.

A charter has been issued to the Cherokee Manufacturing Co., of Blacksburg, S. C. A brickyard will be operated. The stockholders are A. H. Pollock, J. T. Whisonant, W. T. Dye and A. R. Eskridge. They will build a plant of 25,000 daily capacity.

All of the propositions submitted to furnish brick for the new Statehouse at Little Rock, Ark., have been rejected, and the State Capitol Commission have decided to establish a plant for the manufacture of brick to be used in erecting the Capitol building.

The death of Edward J. Davis, manager of the Triphammer Brick Co., of Kansas City, Mo., occurred in that city the 5th inst. Mr. Davis was fifty-two years old, and had been in failing health for some time, although he had attended to his business affairs until just a day or two before his demise.

The Delaware (O.) Clay Manufacturing Co. are running full force full time. The built an addition to their factory this spring, in order to handle the increased business. This gives them nearly 20,000 additional drying space. They have also recently built three new kilns. This company has one contract in Cleveland that will take them until January to fill, and can hardly fill their other orders.

J. C. Steele & Son, of Statesville, N. C., report a splendid trade for this season. Mr. J. C. Steele was agreeably surprised, July 10, his birthday anniversary, by the employes of the company, who gathered around the office and presented him with a beautiful gold-headed cane. The foreman, J. A. Vaughn, made a happy presentation speech. It is needless to say Mr. Steele was more than delighted with his caning.

C. W. Borders, of the Pacific Pottery Co., Portland, Ore., writes that he has found and tested a clay at that point that will make a fine vitrified paver. He says there is a splendid opening there for a paving brick plant, as there is nothing made there but common building brick. He also says the clay bed is conveniently located for a good factory. Any one interested in establishing a plant in that locality can address Mr. Borden direct.

Under date of Aug. 3, the Chambers Bros. Co., of Philadelphia, Pa., write as follows: "We have recently received an order for an outfit of our brickmaking machinery to go to Germany, and, upon the installation of this plant, will probably complete arrangements for a resident agency in Germany. The outfit comprises disintegrator, elevator, pug mill and common and hollow brickmaking machinery, the order for which has been given after several months' study of brickmaking as conducted in this part of the country, by a member of the firm who will operate this new plant. The machinery shipped some time ago to Puerto Rico has been successfully erected

CONTINUED ON PAGE 138.

The "Monarch" BRICK.... MACHINE,

Unquestionably the ———

Leading Horizontal "Soft=Mud" Machine.

More in use than other of its class.

—◆—

The~~

"Iron Quaker" Brick Machine

Unquestionably the ———

Leading Upright "Soft=Mud Machine.

Horse and Steam Power.

More "Quaker" Machines in use than any of its class.

M. BRADFORD. L. J. WILD.

BRADFORD & WILD,

MANUFACTURERS AND SHIPPERS OF

First-Class Brick at Lowest Prices.

Donaldsonville, La., Oct. 21, 1898.

The Wellington Machine Co.,
Wellington, Ohio.

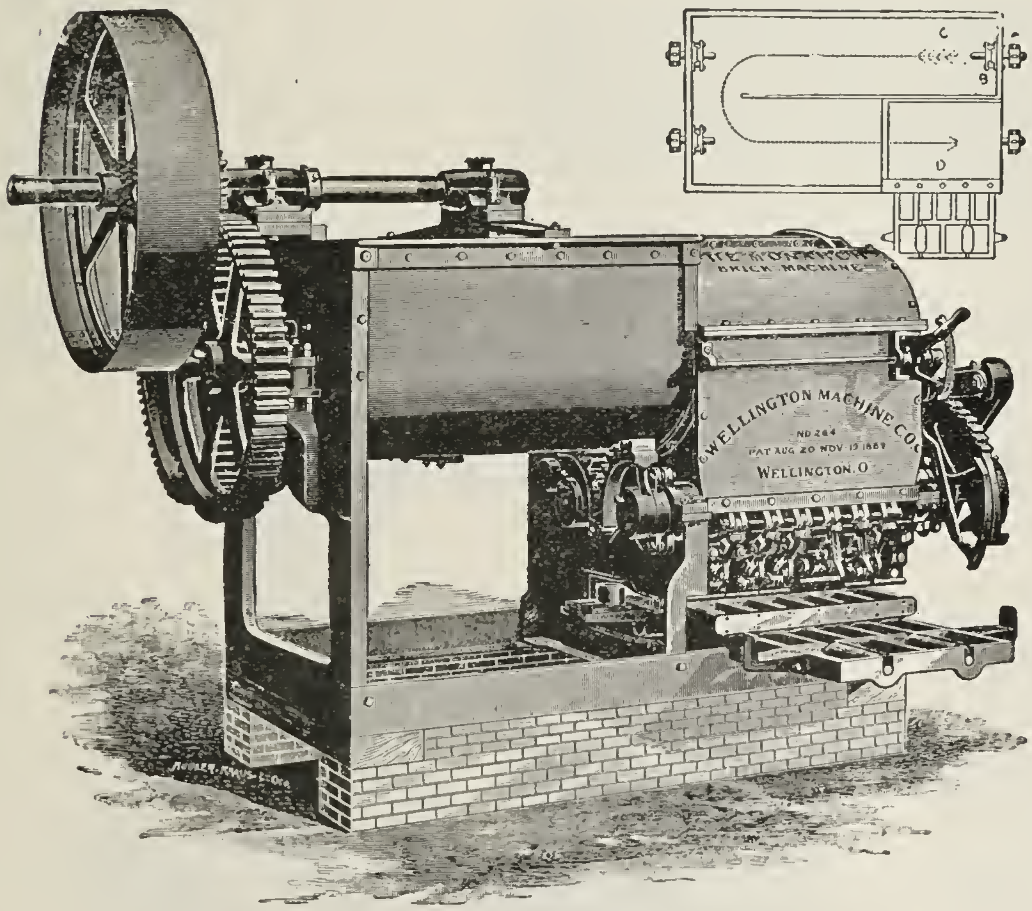
Gentlemen:-

We hereby take pleasure in recommending your "Monarch" Brick Machine which we have had in use since May, and can conscientiously say that it has given us entire satisfaction. It is a "hustler in its work. We have made over a million and one-half brick since we received and got it in operation, and can positively say that it is all that it was represented to us.

We have been in business a number of years, but never knew what it was to do business with comfort. Our business has increased wonderfully. Why? Simply because we make more bricks. More bricks means more money. Had we taken such a machine ten years back we would want to get out of business and take the world easy. Therefore, you are at liberty to refer any one to us at any time, and we will cheerfully recommend the machine to any who contemplate buying one.

Yours very truly,

Bradford & Wild
Per L. J. Wild



We have the Best and Lowest Priced

Mold=Sander.

—◆—

No one else makes . . . .

BALL-BEARING TRUCKS and BARROWS.

The Greatest Improvement in small articles ever put upon a brickyard.

—◆—

ALL OTHER AUXILIARY TOOLS, MACHINES AND SUPPLIES.

The Wellington Machine Co.,

Send for Circular. Mention the Clay-Worker *WELLINGTON, OHIO.*

EDITORIAL NOTES AND CLIPPINGS—Continued.

and is in operation, our representative having returned within the last week with very flattering letters of commendation from the Puerto Rico Co. He reports that they have large orders for brick, and most excellent prospects for a successful business."

The plant of the Boston Fire Brick Co., at the foot of K. street, South Boston, Mass., was damaged to the extent of $45,000 by fire the 12th inst. The flames started from an overheated kiln, and were rapidly communicated to the rest of the works by a high wind which was blowing at the time. All of the machinery, most of which was new, was destroyed. The plant will probably be rebuilt.

The main building of the Syracuse (N. Y.) Pressed Brick Co.'s plant was destroyed by fire, Aug. 10. The interior of the building was all in flames before the fire was discovered. The cause of the conflagration is unknown, as there was no fire or light of any sort about the plant, which had been shut down for the night. The burned portion will be rebuilt and work resumed as soon as possible. The loss was very nearly covered by insurance.

The Harris Brick Co., Zanesville, O., have been having a fine trade this season, and have filled a number of orders of which they are quite proud. They have just closed a contract with a New York firm for 35,000 enamel brick to be used in a bank building on Wall street. The brick will be of the mottled onyx variety, and will be the handsomest consignment ever sent out by them. The company also has a big contract for enamel brick for the new Parliament building at Montreal, Canada.

The old Holmes brick plant at Lincoln, Neb., has been purchased by Klose Bros., who own a large plant at Doniphan, that State. They will at once make extensive improvements, putting in new machinery to be operated by steam, and large continuous kilns will be built. The capacity of the plant will be 50,000 brick per day. The fact that the new owners are already successfully operating a plant of 40,000 daily capacity speaks well of the successful outcome of the new venture. The plant will be known as the Lincoln Brick Works.

The Ironsides Company, of Columbus, O., manufacturers, among other lines of specialties, of lubricants and preservatives for wire rope and gearing, report a large increase in business during the present year. Their special lubricants, which form a deposit to protect from wear and other destructive action, have been introduced into many of the brick works and other clayworking establishments, and cement mills throughout the country, where dusty conditions and consequent rapid wear are so prevalent, with excellent success.

In a recent letter inclosing renewal of subscription to The Clay-Worker and application for membership in the N. B. M. A., and the necessary fee, Walker Clark, of Clark & Allston, of Clarksdale, Miss., reports a splendid trade. Mr. Clark says they are now making a number of improvements in their plant, having put in a Freese brick and tile machine, with automatic cutter. They are also building new dry sheds and kilns, and next season expect to be able to meet the demand for their product, something they have been unable to do this year.

M. H. Donnelly, a brick manufacturer of Berlin, Conn., died at his home in New Britain, Conn., July 22, from blood poisoning, the result of the removal of a tumor some time in the winter. At the time the operation occurred Mr. Donnelly seemed to recover in good shape, but a few weeks ago he was troubled with a severe pain in the place where the tumor had been, at which time blood poisoning set in, resulting fatally. Mr. Donnelly had been engaged in the brick business eleven years, being president of the Donnelly Brick Co. He was a member of the N. B. M. A. and had attended a number of the conventions. He leaves a widow and five children.

The organization of the Baltimore (Md.) Brick Co. has finally been perfected. Officers and directors were elected, and the transfer was made of the twenty-two brick plants that form the consolidation. The following officers and directors were elected: President, Joseph R. Wilson; vice president, Charles F. Diggs; treasurer, Horace Slingluff; general counsel, Fielder C. Slingluff; directors, W. H. Perot, August Wehr, C. H. Classen, Richard Cromwell, Jr., Horace Slingluff, R. C. Meeker, Robert L. Lawrence, Charles F. Diggs, Frank Donnelly, Joseph R. Wilson and John T. Stone. Mr. Lawrence is of New Jersey. The directors elected as the executive committee Richard Cromwell, Jr. (chairman), August Wehr, C. H. Classen, Charles F. Diggs and Horace Slingluff. The concerns in the combination are: Baltimore High-Grade Brick Co., Druid Brick Co., Cromwell Bros., John H. Foss & Co., Daniel Donnelly & Son, Maryland Brick Co., F. & A. Wehr, Smith & Schwartz, William H. Perot, J. Klein & Bros., John Knecht & Sons, Pitcher-Creager Brick Co., Weaver & Harman, H. W. Classen & Co., John J. Hoffman, Allers & Son, Hertel Bros., S. R. Busey, Riverside Brick Co. and Charles Voyce. The capitalization is $2,100,000. Mr. Horace C. Slingluff engineered the deal for the consolidation.

The old and well-known firm of Thomas Carlin's Sons, Allegheny, Pa., has been reorganized, Thomas H. Carlin retiring. The business will be continued under the old firm name by William J. and J. H. Carlin. Thomas H. Carlin wil take a well-deserved vacation, spending several months in Europe, where he will make a study of the clay and cement interests, thoroughly investigating the methods and machinery in use there.

ST. LOUIS NOTES.

THE BRICK BUSINESS is suffering from a very bad case of midsummer dullness. The advanced prices are still maintained, but the volume of business is discouragingly small. The spring trade opened up in good shape, with excellent prospects of a good season's business, but the building trade to-day is duller than a year ago, when it was supposed to have reached rock bottom. This is largely attributed to to the rapid advance in prices, as considerable work has been withdrawn from the market, awaiting more favorable prices, for plans that were figured on last season are now found to run over 30 per cent. higher, and the capitalists have not yet made up their minds that such a rapid rise is going to be sustained.

Washington avenue property is having a local boom through the aggressive action of the trustees of Washington University in investing their new endowment funds in business blocks beyond the present recognized center of the wholesale dry goods trade. That the buildings will prove a good investment is generally recognized, as the future of this street is now safely assured for both the wholesale and retail dry goods business. But nearly all the building activity is concentrated on those few buildings.

The new Republic building, on Olive street, a three-story, designed by Architect Issac Taylor, is now completed, and it seems odd to see a new modern building of this modest height among the fourteen and sixteen-story sky-scrapers that surround it. It may be a good advertisement from its novelty, but such low buildings do not add to the architectural attractiveness of the street, when all its neighbors belong to the imposing tall office building class.

The St. Louis Terra Cotta Co. has increased its capital and doubled its plant, and is vigorously reaching out for business, which it well deserves, as it turns out a high grade of terra cotta. This is the third terra cotta plant that has been built in modern St. Louis.

The site for the St. Louis World's Fair in 1903 has not yet been selected, as the subscriptions are still incomplete. The railroad people have made some handsome contributions to the committee's $5,000,000 fund.

The Standard Tile Co. are completing another large kiln that is patterned after their new design that has proved so successful.

The Thomas Landing Brick Co. are now making red and other dark colored stock brick, in addition to their former line of buff bricks, by using a shale mixture. "LOUIS."

A REACTIONIST.

WEARY WILLY—Dey say action and reaction are always equal.

FRAYED FAGIN—Yes. I t'ink one uv my ancestors must have worked himself to death and I'm de reaction!

STEVENSON & CO.,

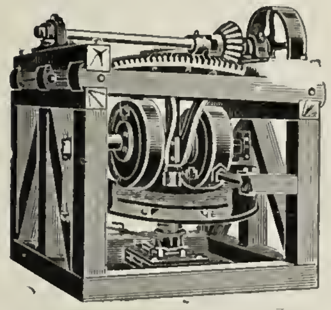
WELLSVILLE,
OHIO, U. S. A.

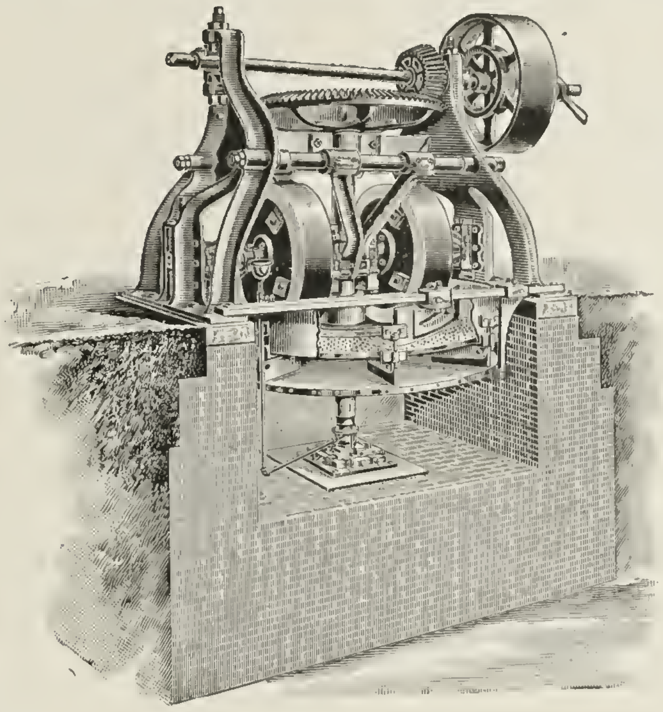
MANUFACTURERS OF

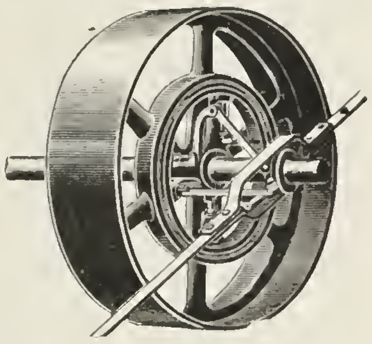
Brick Machinery.

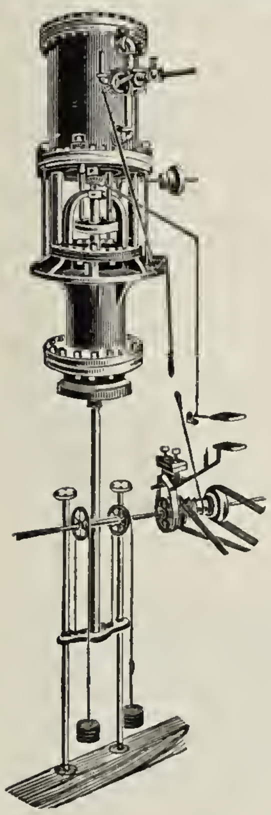
COMPLETE EQUIPMENTS.

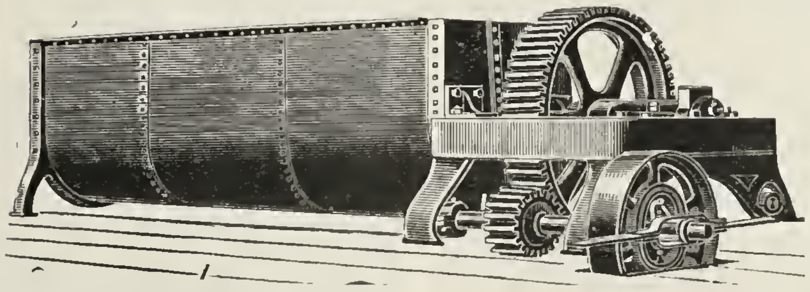
Tile Machinery

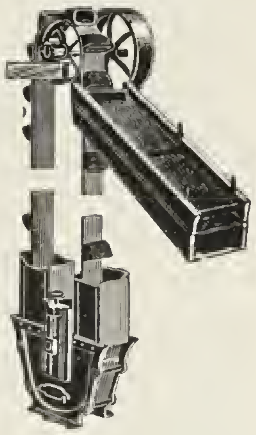












Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

PACIFIC COAST NEWS.

The RENEWED ACTIVITY of the building market seems to indicate that the vacation season is drawing to a close, though the brick and tile men will hardly be crowded with orders for some time yet. Two or three contracts of large size have lately been let. The largest is for a large brick building on Market street, near Sixth, for $61,350. Mahoney Brothers are the contractors. F. W. Kern has been given the contract to build a three-story brick warehouse on Beale street, near Howard. The contract price is $22,890.

An item of considerable interest is the purchase of an entire block in the Pacific Heights section of the city for $90,000, on which the purchasers will immediately erect eight fine residences of different style and appearance. Each house will be built on a block not less than 50 by 137½ feet in size, and will vary in cost from $6,000 to $14,000. The buildings will have brick basements, and will require a large aggregate amount of tiling, etc.

In the country districts the prospects for the brick trade are bright. A number of brickyards are preparing to make an increased number, and even in the dryest part of the State there are expectations of a prosperous fall. In the Northwest the output will be large, but probably not quite so large as anticipated, owing to the change for the worse in the prospect of the Oregon and Washington grain crop.

In last month's Clay-Worker mention was made of the fact that the Independent Pottery Company had been incorporated, with a capital of $100,000, to do business in this city. Since that item was written it has developed that the organization of the new company means an active war on the old established makers of terra cotta here. Claus Spreckels, the millionaire sugar king, is behind the new concern, and it is given out that he will not only make terra cotta conduits for his new electrical company, but will also carry the war into the camp of the old companies and become an active bidder for the general terra cotta business of California. The older companies do not, however, appear to be frightened by the threatened competition. The works of the new company are located in the old building of the American Sugar Refining Company, at the corner of Union and Battery streets. The directors are George Gray and Henry Gray, of Gray Brothers, contractors, and Charles Heig, W. D. K. Gibson and F. S. Samuels, of John D. Spreckles & Bros. George Gray is president.

A brickyard is to be started at East Pine, Ore., in the near future, by Hulse Bros.

H. Steinhauer started his brickyard at Greenleaf, Ore., the first of this month, and expects to put out 100,000 brick.

The Standard Fire Brick Works, west of Anaconda, Mont., are now running full blast. There are 5,000,000 brick already in the yards, and orders have been received for a great many more.

Mr. Algie Higley has been experimenting with the clay banks near Chelan, Wash., and has demonstrated that it is the finest kind of fire brick clay.

The brickyard at Fairfield, Wash., has resumed operations once more.

The Humboldt Lime Company, of Jacoby Creek, Cal., have completed their kiln, and work has been commenced for the first burning.

Curran & Lindgren, of Bakersfield, Cal., are figuring on putting in a plant for the purpose of burning their brick with crude oil.

The West Kootnay Brick and Lime Company is working a large force of men at one of its Nelson, B. C., yards, and at the old Walters yard considerable work is being done. This company has also a well-equipped yard at Balfour, and at its lime quarry a force of thirteen men is employed in getting out lime rock for the building trade of Nelson.

H. J. Lambert, of Carbondale, Cal., is soon to open new pottery works at that place. The gentleman is owner of a bed of clay on his property that, after a series of experiments, proved to be the best of potters' clay.

Mr. Gregg, of the firm of Holt & Gregg, brick manufacturers of northern California, states that the demand for brick in that section is in excess of the output at present. New engines and machinery have been added and the equipment of the plant improved in every way. The firm has considerable building under way at Red Bluff, Cal., and other points south.

Morton & Son are about to burn another kiln of brick at their yard on the Krahner place, Placerville, Cal. They will have about 120,000 brick.

Heberling & Toothacre, building contractors of Visalia, Cal., have purchased a piece of land in that locality, with the purpose of engaging in the manufacture of brick. They will probably burn 1,000,000 brick this year before the rainy season makes its appearance.

Stevens & Collins have recently burned a kiln of 150,000 brick at Kendrick, Idaho.

Charles Y. Burr, the well-known brick and stone mason of Sumpter, Ore., has a force of men at work at his brickyard. He will burn a kiln of 300,000 brick, 100,000 of them being already contracted for.

E. Robbins has purchased a brick machine, and has started a yard at Fairfield, Wash., with a capacity of about 15,000 brick per day.

The Kern Brick Company, of Portland, Ore, has filed articles of incorporation. The company will engage in manufacturing and selling brick, tile, etc. The company has a capital stock of $20,000, divided into 200 shares of the value of $100 each. L. E. Kern, A. A. Yerex and V. E. Randles are the incorporators.

A brickmaking plant has been installed at Visalia, Cal. The new company has contracts to make 1,000,000 brick before Nov. 1 next.

Messrs. Faustino Martinez, Ignacio de la Torre y Mier, Antonio Barrios, Indalecio Ibanez and Eudaro Barrios have established a factory near Guadalupe Hidalgo, Mexico, for the manufacture of brick, hydraulic lime and construction materials.

SUNSET.

San Francisco, Cal.

NOTES FROM TIDE WATER, VA.

THE SUFFOLK CLAY CO. has been organized, with $10,000 capital stock. The company has been granted a charter to manufacture all kinds of clay products, also to deal in real estate and for utilizing the water power for water and electric power and lighting purposes. The officers are C. A. Shoop, president; N. R. Withers, secretary and treasurer, and H. L. Jacobs, general manager. The property is located one-half mile from Suffolk, on the S. A. L. railroad, and consists of thirty-two acres of land, with a large water front. A large force of men are at work grading and building, and this plant will be finished as soon as possible.

Prof. C. J. Kernodle and Sydney Davis are putting in a new brick plant near Suffolk to manufacture soft-mud brick. They are putting in a second-hand Talcott soft-mud machine formerly used by J. T. Nurney & Co. They will dry their output in racks.

Mr. A. R. Root, of the Chambers. Bros. Co., Philadelphia, Pa., has been in this section for the past two weeks, and has booked orders for three machines complete, with pug mills, disintegrators, conveyors, etc. Mr. Root is a charter member of the N. B. M. A., and is one of the few who has never missed one of the meetings since it was organized.

The Nansemond River Brick and Tile Co.'s machinery and engine house, which was burned on June 10, has been rebuilt, and started to making brick on July 24.

The Clay-Worker is getting better and more interesting every month, and I don't see how any brickmaker can afford to be without it. I have a book of the past five years' Clay-Workers, sixty in all, which I prize very highly. The borrower worries a subscriber who is keeping each copy, and I would like to say to them, if they want to read The Clay-Worker they can do it for only $2 per year, and it is money well invested.

H. L. J.

COMPARATIVELY SAFE.

HANKS—Old Bill Joslyn has a kind word for everybody

BORROWBY—He kin afford it; everybody knows it's impossible to borry anything from him!

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED — Position as manager or superintendent; A 1 references, covering entire 15 years business experience; past four years superintendent of one of the largest clayworking establishments in New York market. Address OHIO,
8 1 d Care Clay-Worker.

WANTED — A thorough, practical, up-to-date brickmaker, lifetime experience, with some capital, would go in with a partner who has an established yard with plenty of good clay or shale, and manage the business. Address T. I. P.
8 1 d Care Clay-Worker.

FOR SALE — Cheap, one Chief steam power brick machine, one Chief horse-power brick machine, and one 20 horse-power stationary engine, all built by Anderson Foundry & Machine Works. Address
J. A. VAN OSDOL,
8 1 p Anderson, Ind.

FOR SALE OR RENT — On account of owner's death; good chance for a live brickmaker; best town in southwestern Iowa; yard complete; don't write unless you mean business; only yard in town. "Good money in it for a good man." Address E. D. F.,
8 1 p Care Clay-Worker.

FOR SALE — Two machines, stiff and soft mud, engine and boiler, trucks, barrows, belting, shafting, shedding, tools, etc., all in good condition; this is not a lot of old junk, but a plant that must be sold at once; if you are looking for a bargain you need look no further; $700 cash takes it all. Address N. E. B.,
8 1 p Care Clay-Worker.

FOR SALE — Two-mold, three-mold and four-mold dry press brick machines. new and second hand. Latest styles and all in first-class order. Also several screen presses for ornamental dry press brick, cheap. We have bargains in these machines, and all are guaranteed to do their work. WESTERN MACHINERY & SUPPLY CO., 159 and 161 La Salle St., Chicago Ill. 8 1 p

FOR SALE — A complete up-to-date dry press front and ornamental brick plant, equipped with all the necessary machinery, buildings, kilns, etc.; unlimited supply of the best clay for making red, buff, gray and intermediate shades and iron spot brick; good shipping facilities, and within easy reaching distance of the New York and other eastern markets; a rare opportunity to obtain a first-class plant cheap. For terms, etc., address DAGO,
8 1 d Care Clay-Worker.

WANTED — Some one, in return for an interest in them, to furnish the capital to procure foreign patents on a device for surface or sub-irrigation, which will distribute water in uniform quantity from every section of pipe or tile, whether laid in level or uneven ground; can be used with plain round tile very cheaply on large areas, but better with a specially designed conduit on greenhouse benches and small plots; not only reduces to a minimum the cost of distributing water under grass or cultivated crops, but does it automatically, uniformly and efficiently; patent for this country already secured. Address, with references, PATENTEE,
8 1 p Box 442, Winchester, Ky.

POSITION WANTED — Enameler is open to take charge of first-class plant. Satisfactory proof of ability given firms of good standing and ability only.
J. HIGGINSON,
8 3 p Grant Ave., Trenton, N. J.

WANTED — A second-hand Chambers end-cut machine of largest size for cash, or will give in payment machine of same make of smaller capacity and cash. Address F. ACE,
8 1 d Care Clay-Worker.

FOR SALE.

1 Henry Martin horse-power brick machine, good order.

1 Standard wood frame horse-power brick machine, used but a few days.

1 Standard wood frame steam power brick machine, used to make about 100,000 brick.

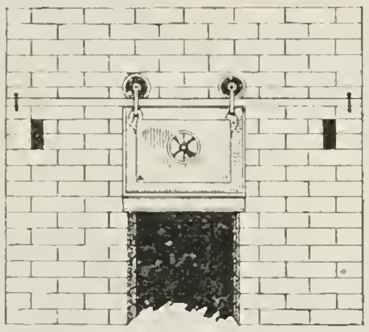
4 Reliable hand brick machines, but little used.

1 E. M. Freese side-cut board delivery, but little used.

1 Wellington mold sander, but little used.

HORTON MFG. CO.
9 tf d Painesville, O.

The Mitchell Slack Coal and Coking Furnace



The Mitchell One Door Coking Furnace IS NO EXPERIMENT.

Can be attached to any style of kiln.

Guaranteed to be the cheapest and most economical furnace on the market to construct and operate.

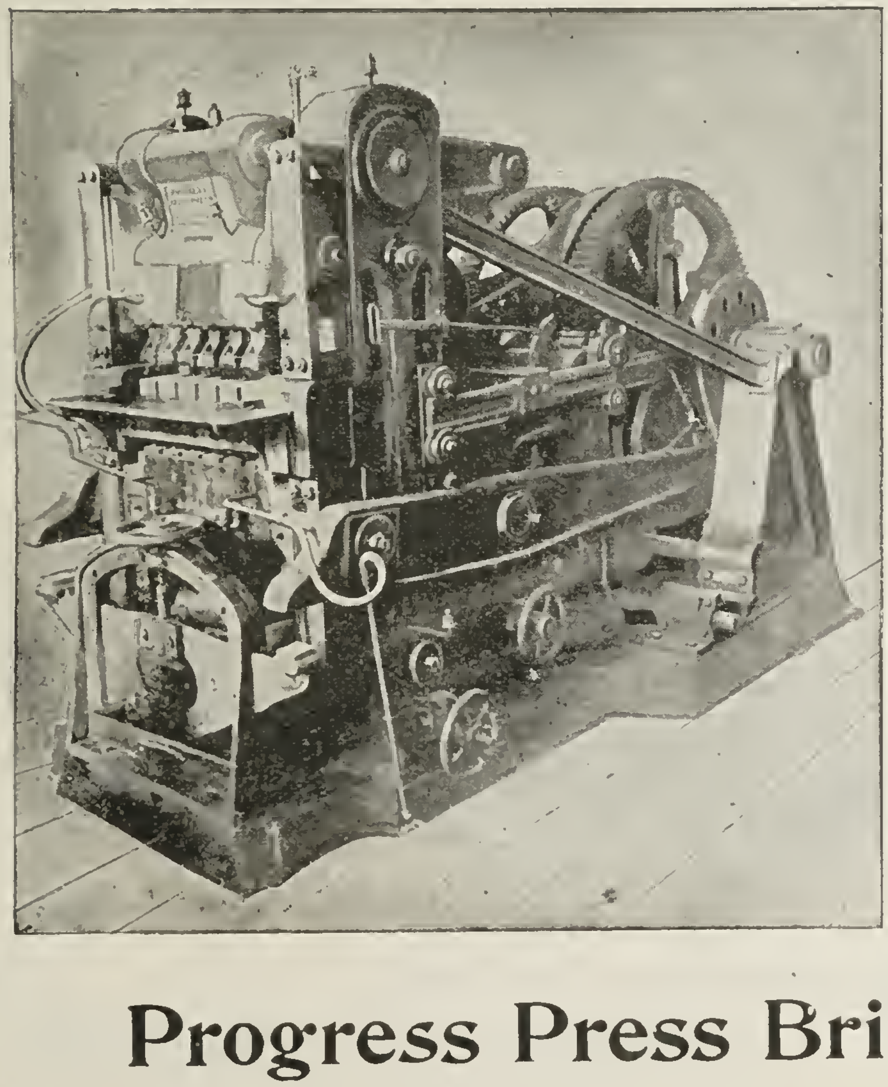
It positively excludes all cold air from coming in contact with your ware.

It requires nothing but the cheapest grade of slack from start to finish of burn.

FOR FURTHER PARTICULARS AND TESTIMONIALS, ADDRESS

W. C. MITCHELL, Oelwein, Iowa.

The Progress Brick Press.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE
ON APPLICATION. . . . .

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R. *ST. LOUIS, MO.*

FOR SALE — One of the best paying brick and tile factories in Iowa.
12 tf d Lock Box 36, Lohrville, Ia.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — One four-foot stationary wet pan, bottom driven, with steel dust cover; almost new; Phillips & McLaren make; cheap.
KENDALL & FLICK,
618 Penn. ave. N. W., Washington, D. C.
6 1 d

FOR SALE — About seven thousand steel pallets (7,000) in fair condition, to hold six brick (6) each. For further information, prices, terms, etc., address
DELAWARE TERRA COTTA CO.,
8 1d Wilmington, Del.

WANTED — Position as superintendent or burner of either dry pressed or plastic brick works; thoroughly practical in every department of manufacturing same; No. 1 references given. Address ST. LOUIS,
6 tf d Care Clay-Worker.

FOR SALE —Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address
OLD BRICKMAKER,
6 tf d Care Clay-Worker.

ENOUGH MATERIAL daily for 30,000 pink, buff pressed front brick, mined as an incidental product in getting coal. Want expert manufacturer with capital to build brick plant at the mine. Clay in mine cars delivered to crushers and coal dumped around kiln doors. Five acres for plant. Plenty of water Favorable freights. Material for 1500 million brick besides large variety mixers in abundance. Give full references in first letter. Address,
7 3 c ALBERT PIKES, care Clay-Worker.

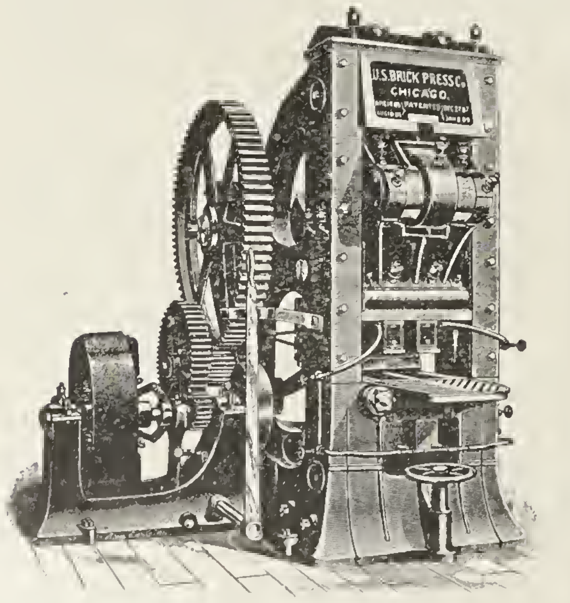
COMPLETE FINE BRICK PLANT FOR SALE OR TO LEASE.

For sale, or to lease, at a sacrifice, the complete equipped plant at Kreischerville, Staten Island, N.Y., formerly operated by the Anderson Pressed Brick Company. This plant is probably the finest in the country. It is fully equipped for the manufacture of all grades of pressed brick, fire brick, hollow brick, paving brick, etc. The buildings are of brick and stone, and in the best condition, and were erected in 1898. The kilns, boilers, engines, clay conveyors, steam pressing machines, etc., were constructed in the most approved manner and without regard to cost.

Unexceptionable water from facilities of more than 1,000 feet; private canal, and ample docks for the reception and shipment of goods.

One of the finest clay banks in the country is a part of this plant, and readily accessible to the works. Sufficient clay, mined and dried, is on hand to permit the starting of the works at once.

This splendid property is offered for sale at a sacrifice, or will be leased at a moderate rental. Apply to JOHN WEBBER,
8 1 p 10 East 23d St., New York City.



FOR SALE CHEAP.

The above two-mould United States Dry Press Brick Machine. Has never been used.
BAY STATE IRON WORKS. Erie, Pa.

Clay Workers MANGANESE.

CRUDE, GRAIN AND GROUND.

BOOKLET ON THE MATERIAL, ITS USE AND COST, FREE.

KENDALL & FLICK,

618 Penn. Ave. N. W., WASHINGTON, D. C

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

....WHAT THE CLAY WORKER NEEDS....

Is a belt that will accomplish the heavy work required of it,

holding the bucket firmly without slipping.--This the

Leviathan Belting

does better than any other, and, what is of more interest to Clay Workers, the LEVIATHAN will

WORK FOR YEARS IN A DUST CLOUD,

or exposed to weather conditions of any kind.

THESE ARE THE REASONS WHY LEVIATHAN BELTING IS IN SUCH GENERAL USE AMONG CLAY WORKERS.

MAIN BELTING COMPANY,
1221-41 Carpenter St., Philadelphia, Pa.
1221-41 Market St., CHICAGO. Send for Price List and Samples. 120 Pearl St., BOSTON.

IF YOU NEED.. **Wooden Pallets**

WE CAN FURNISH YOU THE BEST

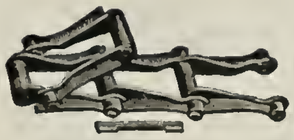
We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

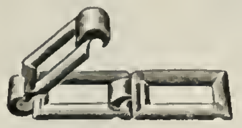
We can ship them anywhere.

Get good Pallets from those who know how to make them, It will pay you in the long run. . . . .
Send for circulars and prices.

W. B. MERSHON & CO.,
Saginaw. East Side Mich.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

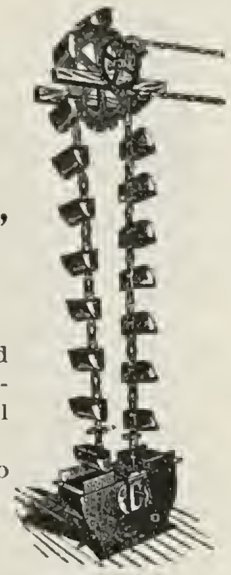
F. H. C. MEY,

Chain Belting Engineering Works,

Approved Appliances for

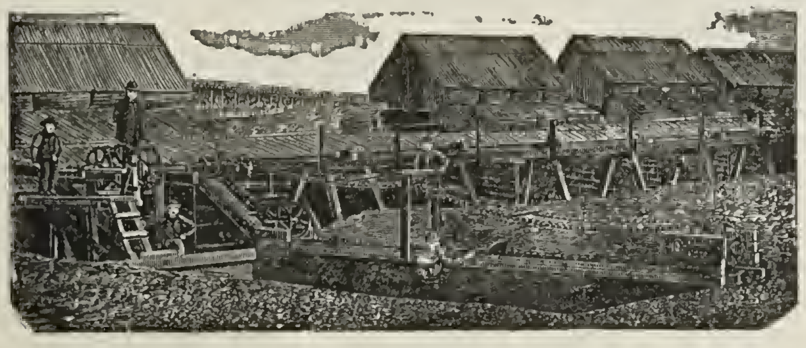
Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.



THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



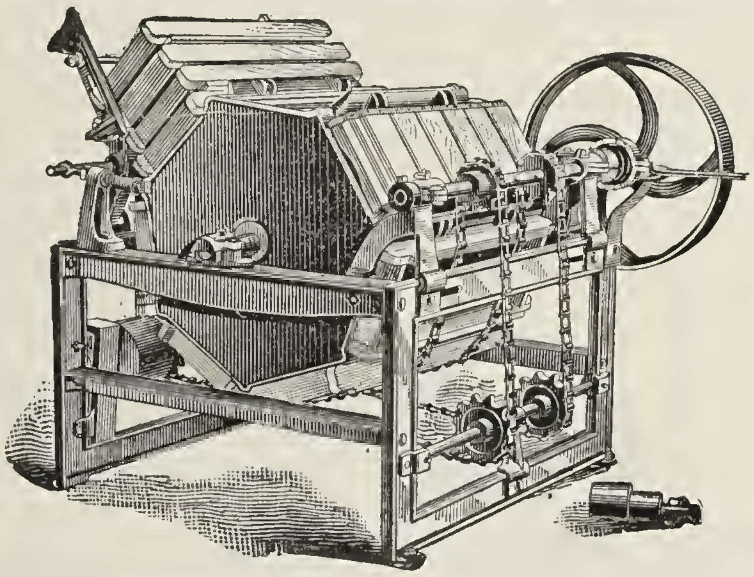
MEY PATENT CLAY ELEVATOR.

Make Many More Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

CHAMPION Brick Mould SANDING MACHINES.



No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds. My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW. N. Y.

We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

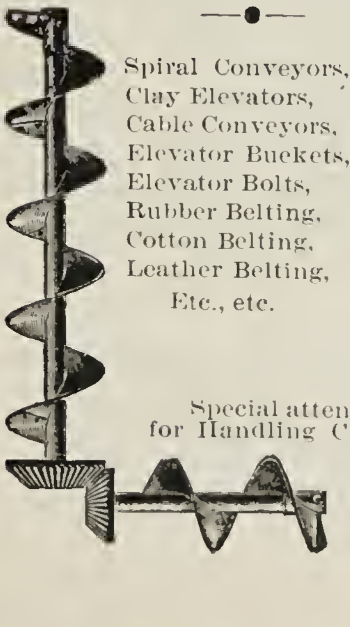
The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been successful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

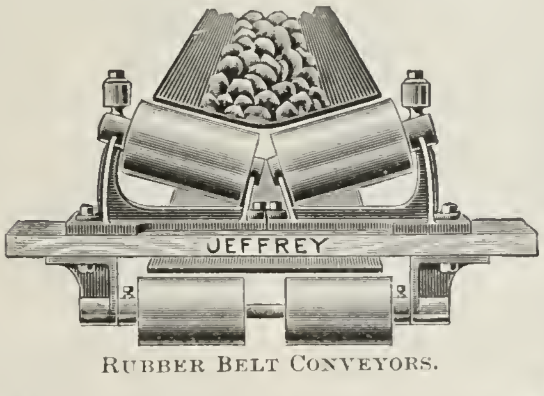
The JEFFREY MANUFACTURING CO., Columbus, Ohio.

Elevating, Conveying and Power-Transmission Machinery,

For Handling Material of all Kinds.



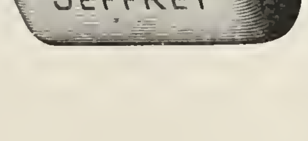
Spiral Conveyors,
Clay Elevators,
Cable Conveyors,
Elevator Buckets,
Elevator Bolts,
Rubber Belting,
Cotton Belting,
Leather Belting,
Etc., etc.



RUBBER BELT CONVEYORS.

Link Belting,
Chains, (all styles),
Sprocket Wheels,
Shafting,
Pulleys,
Hangers,
Gearing,
Elevator Boots,
Etc., etc.

Special attention given to the designing of machinery for Handling Clay, Green Tile, Brick, Sewer Pipe and packages of every description. We can in many instances effect a saving of from 10 to 50% over present methods used.



SEND FOR 1899 CATALOGUE AND PRICES.

FOR SALE — Several second-hand chain hoists, from 2 to 8 tons capacity; also several engine lathes, boilers, engines, pumps, etc. Address CLEVELAND,
3 tf d Care Clay-Worker.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Wellsburg, W. Va.

FOR SALE—GREAT BARGAIN—Henry Martin "A" Brick Machine, capacity 30,000, very good order; pug mill, crusher, elevator, shafting, etc, $750. All in first-class working order.
1 tf dm BOX 13, care Clay-Worker.

FOR SALE — One good 35 H. P. Chandler & Taylor engine; 40 H. P. tubular boiler; hot and cold water pumps; all in good condition. Will be sold cheap.
C. & A. POTTS & CO.,
5 tf d Indianapolis, Ind.

FOR SALE — Three Eagle represses, as good as new; scarcely used at all, owing to change of process, making repressing unnecessary; they are the latest improved design, and will be sold at a bargain. Address BUSY BOY,
5 y d Care Clay-Worker.

FOR SALE—Four-mold Boyd Dry pressed brick machine, quite new, at half cost. Capacity 25,000 to 30,000 per day. Also one 4-mold Eureka dry pressed brick machine, good order; great bargain. One straight line engine, 14x14 cylinder; excellent order; very low. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator.
C. SIEDLER, Pres.
9 tf d 156 Fifth Ave., New York, N. Y.

FOR SALE — Brickyard in good running order, splendid location on water front between thriving cities of Seattle and Tacoma, Wash.; unlimited supply of No. 1 clay; bank 200 feet high, immediately back of machine; sand bank adjoining; horse-power Quaker machine, pallets, etc.; wharf, buildings, 20 acres land, grade water; wood $1.75 per cord delivered; price, $2,500. Address GEO. H. BURROWS,
6 3 cm Burton, Wash.

FOR SALE — One of the best plants in Pennslyvania, situated on railroad, within 50 miles from Pittsburg, now running on high grade repress, dry press, white, gray, mottled, Roman and Pompeiian facing brick, fire clay, etc.; present capacity of machinery 40,000 daily; can be increased to 100,000; all machinery, kilns, engine, boiler, etc., in first-class condition; satisfactory reasons given for selling. For particulars address G. C. H.,
6 3 cm 132 River st., Cleveland, O.

FOR SALE.

One extra heavy Quaker machine in good order.

One, horse power machine which we will guarantee good as new, was used to test clay, making about 100,000 brick.
HORTON M'F'G. CO.,
11 tf d Painesville, Ohio.

BRICKYARD FOR SALE.

In New Jersey, 54 miles from Philadelphia, with buildings and machinery; clay of good burning quality immediately adjoining; only small amount capital required from reliable person; ready sale of output. Address, with references,
BARON DE HIRSCH FUND,
6 3 cm 45 Broadway, New York.

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of
WESTBROOK & WELLS, Ogdensburg, N. Y.

FOR SALE CHEAP.

A Good Dry Press Brick Machine, in good running order, will be sold for less than half first cost. Its all right and a bargain. Have changed to Stiff Clay Process. Address

"SECOND HAND,"
care Clay-Worker.
1 tf d

VanDuzen's STEAM JET Pumps.

Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines**, etc., for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Write for Catalogue No. 68.

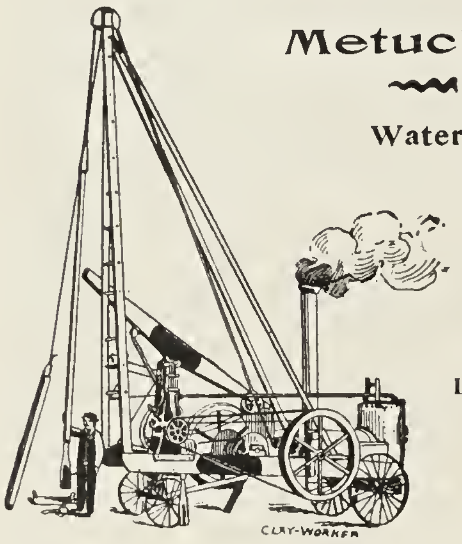
The E. W. VANDUZEN CO., Cincinnati, Ohio.

W. R. Osborne,

Metuchen, N. J.

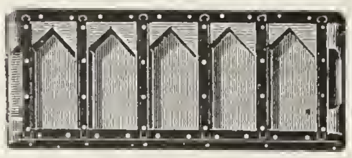
Water Wells,
Tanks,
Pumps,
Etc.

LOW PRICES



The Henry Martin
Brick Machine Mfg. Co.,
Lancaster, Pa.

Machine
Brick Moulds
a Specialty.



PRICES:

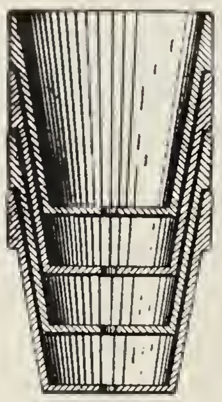
Steel bound machine moulds, 5 or 6 brick	$1.75 each
With Steel Lined Heads, 5 or 6 brick	$2.00 each

With Panel Bottoms, solid, 5 cents per brick extra.

With name plates 5 cents per brick extra.

Top irons dovetailed, or crimped if preferred. Handles any desired pattern.

SEND US A SAMPLE ORDER.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine
(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,
78 South Pennsylvania St., INDIANAPOLIS, IND.

St. Louis Terra Cotta Co.,

....MANUFACTURERS OF....

Architectural and Ornamental Terra Cotta.

Works and Office, 5801 Manchester Ave.,
ST. LOUIS, MO.

In Stock: Diaper Tile of all sizes, Caps, Coping, String and Belt Courses, Panels, Skewbacks, Etc.

ESTIMATES FURNISHED ON APPLICATION.

WE HAVE RECENTLY ISSUED OUR

CATALOGUE No. 25

A Book of 380 Pages.

Which contains detailed descriptions and prices of **Conveying, Elevating and Power Transmitting Machinery, such as Caldwell Helicoid Conveyor, Elevator Buckets and Boots, Belting of all kinds, Pulleys, Shafting and Bearings, Car Pullers, Wire Cloth, Perforated Metal, Equipment for Rope Transmissions, etc.**, and much useful **Engineering Information** applicable to our line of specialties. A Postal Card from anyone interested in the machinery manufactured by us will bring a copy by return mail.

H. W. CALDWELL & SON CO., 127-133 West Wash. St., CHICAGO, ILL.

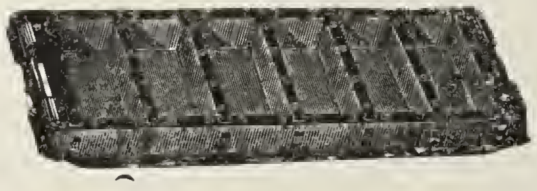
1899--BRICKYARD SUPPLIES--1899

NOW Is a good time to look over your stock and see what you will need for the coming season.

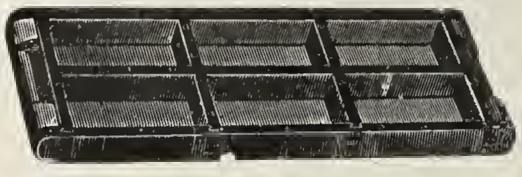
Send your orders to "Arnold's" for what you need. You can send the order now and we will have them ready to ship at the time you want them.

You will be sure to get the best there is made and if you want anything special in the line of Moulds, Trucks or Barrows of different designs you can get it made to order here at reasonable prices.

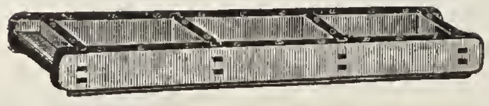
Moulds, Trucks and Barrows a Specialty.



6 Brick Machine Mold.



6 Brick Hand Mold



3 Brick Hand Mold.

D. J. C. ARNOLD, New London, Ohio.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

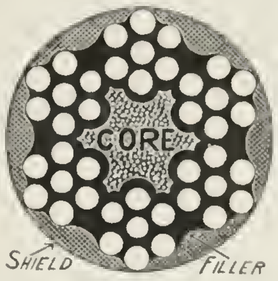
E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } **Chenoa, Ill.**

Why Not Preserve

YOUR

Wire Ropes,
Manila Ropes,
...Gearing?



Catalogue P tells how.

The IRONSIDES CO.,
Columbus, Ohio, U. S. A.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.
NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. Carbonate of Barytes

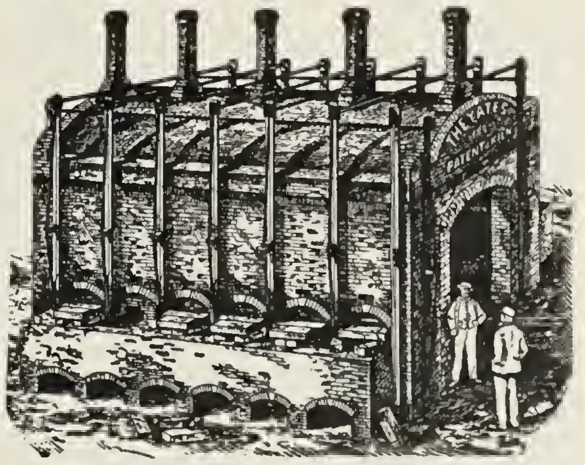
The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS, Agent and Patentee, **161 Grand Street, Rahway, N. J.**



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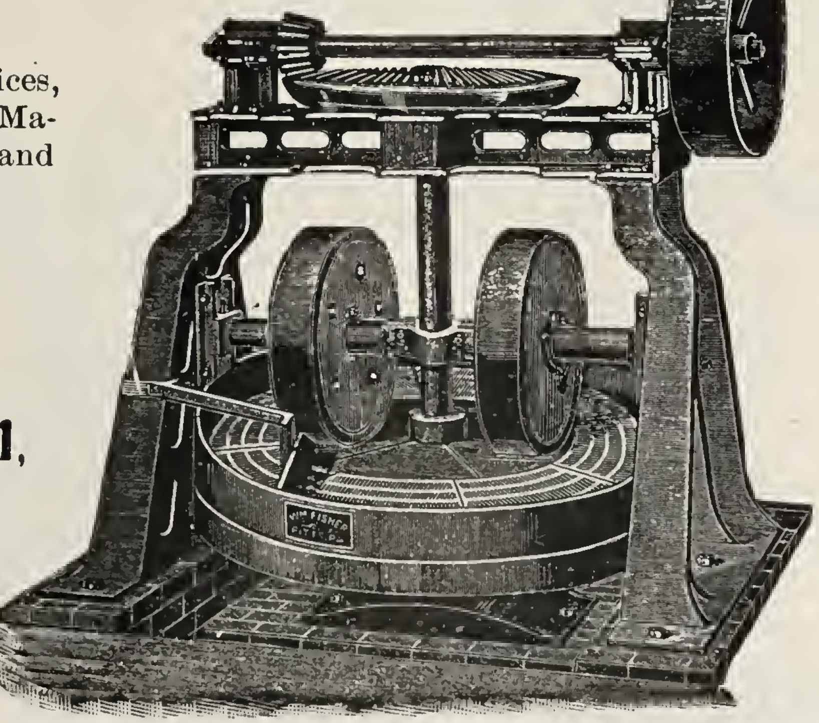

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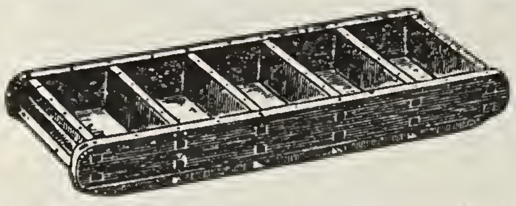

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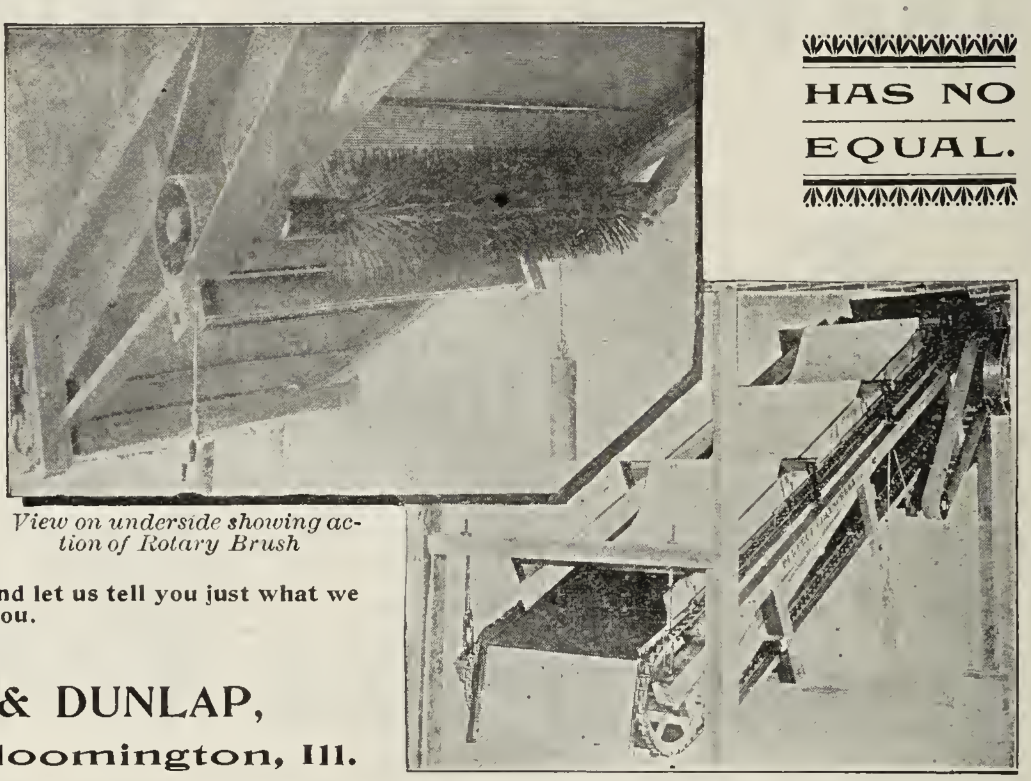

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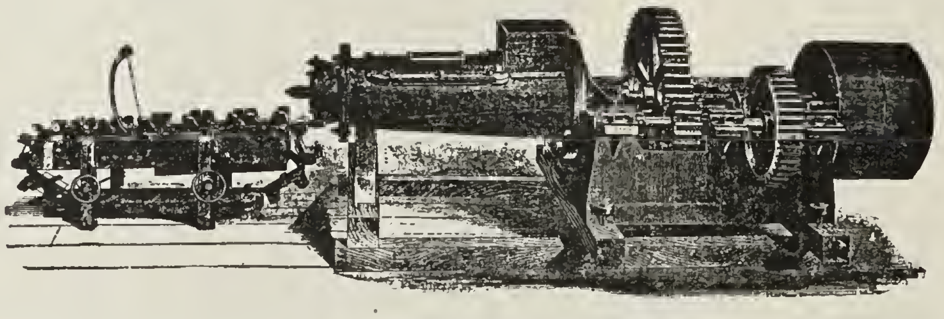

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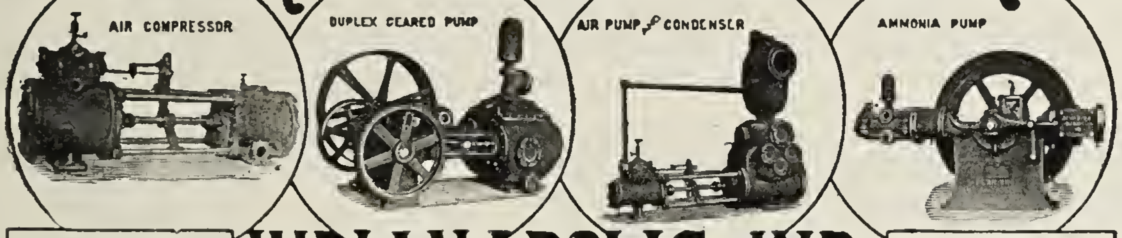

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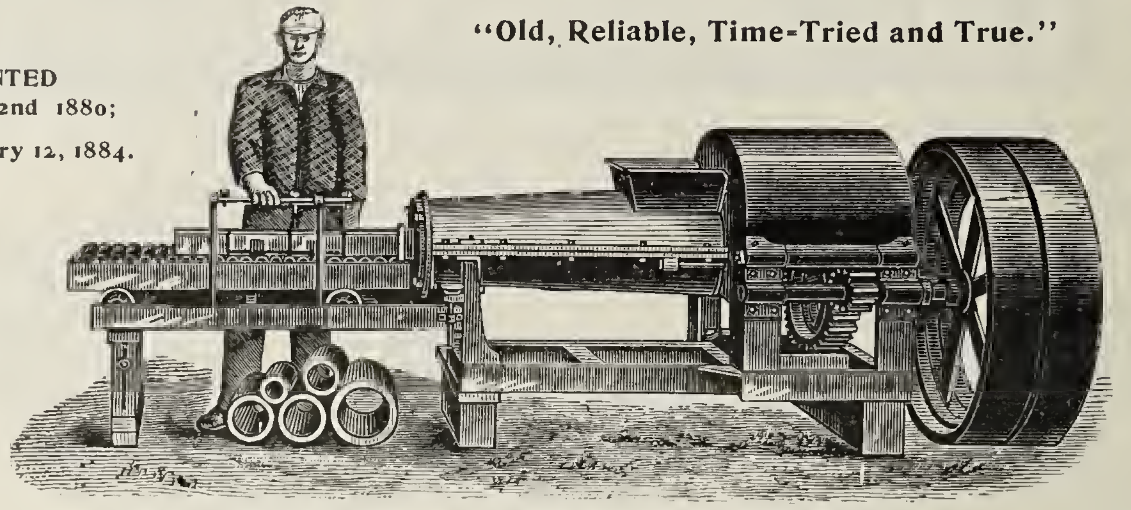

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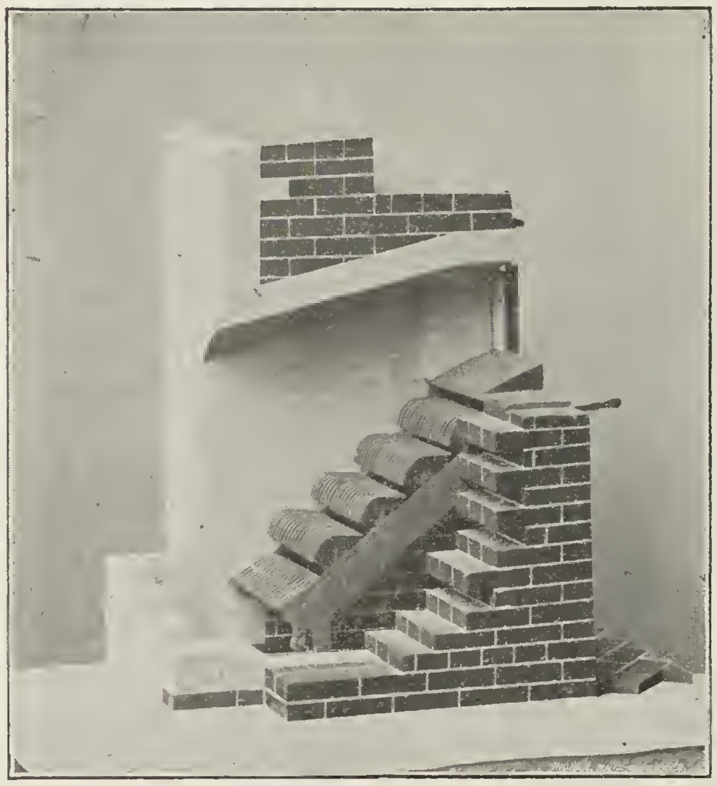

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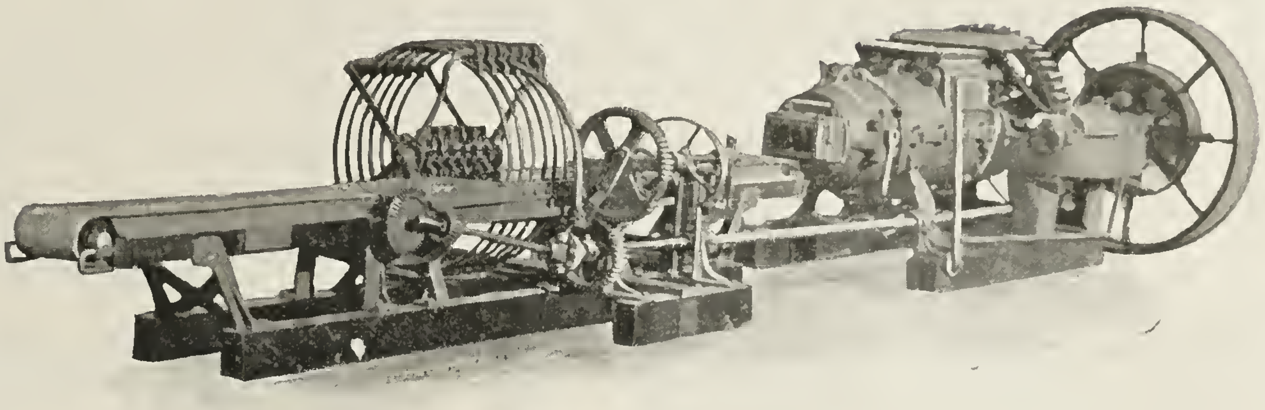

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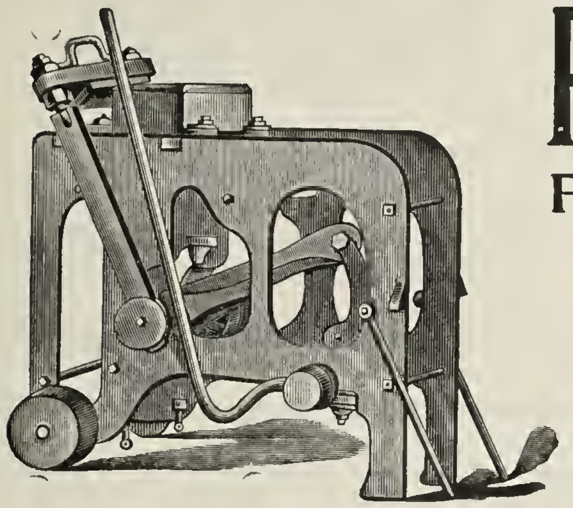

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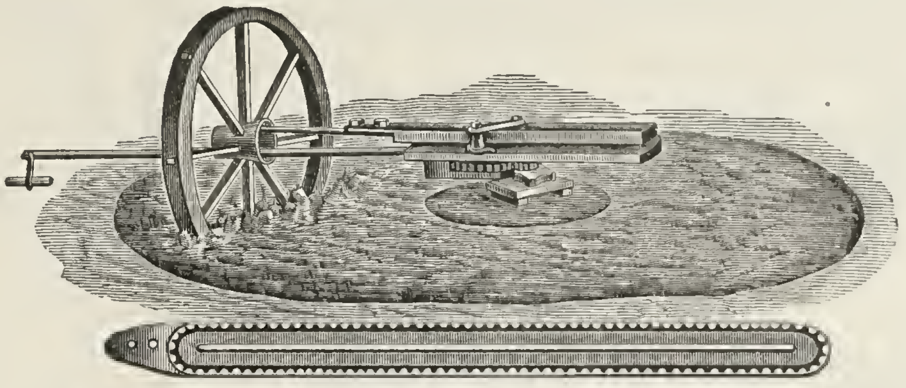

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This Kiln is now burning

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Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success. In fact we have been able to do much more than you had guaranteed the kiln would do. We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours, R. G. EISENHART, Treas. and Gen. Man.

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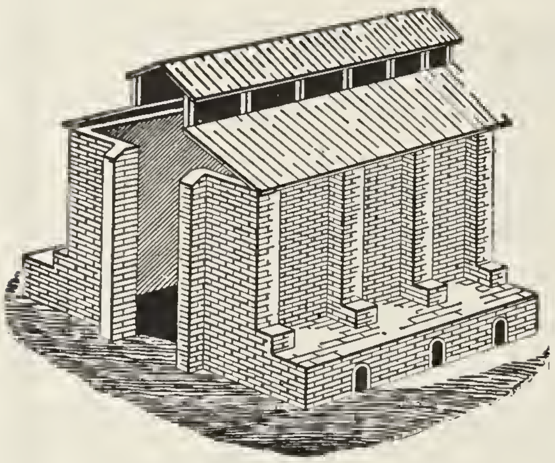

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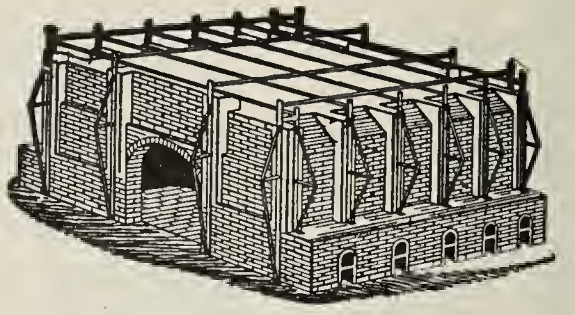
For Burning all Kinds of Wares.



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Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

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FOR BURNING BUILDING BRICK.

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The Bushong Down Draft Kiln

Is so constructed that the **heat** is **equally distributed** to **all parts** of the **Kiln.**

For **uniform** and **all hard burning** this kiln leads them all. Built any size desired. This kiln is now being used by some of the largest brick plants in the country.

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Dryer Cars

At a **very reasonable price** give us an opportunity to show you our new designs. We have used them in the **Brick Business** and have overcome the **weak points.**

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That a Very Small Quantity of

Dixon's Ticonderoga FLAKE GRAPHITE.

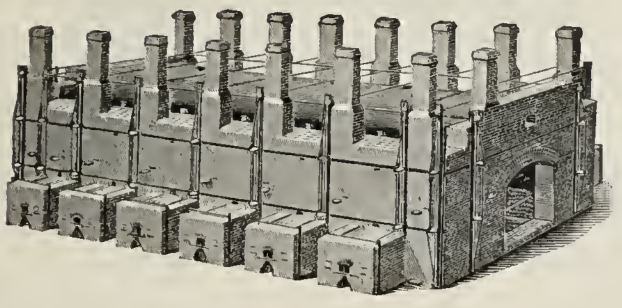
Say 5 to 10 per cent. added to the grease or oil that you are now using, will make you oil or grease do three to six times as much work and do it much better.

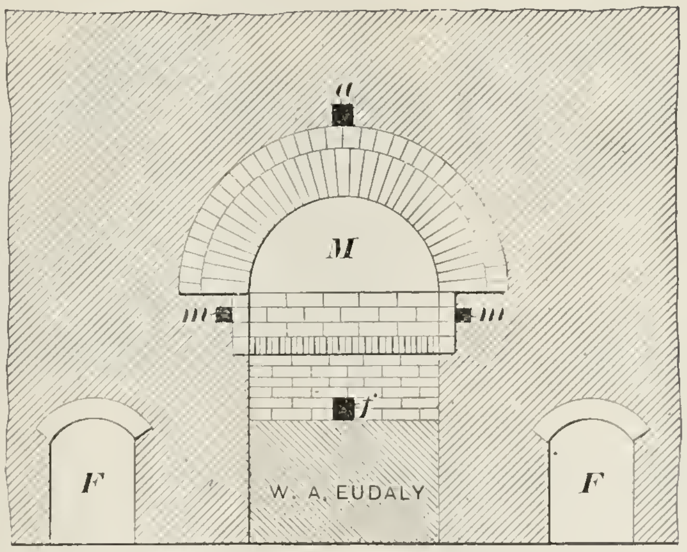
This has been fully demonstrated but if you want to prove it for yourself we will send you samples free of charge and a pamphlet giving full particulars.

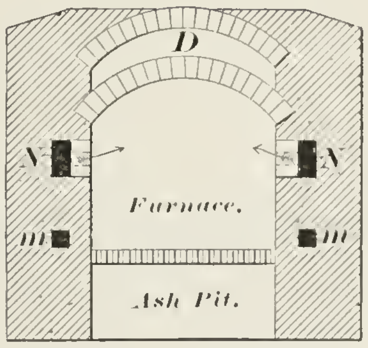
JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.







These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

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We are the Largest Manufacturers of Dryer Cars in the World.

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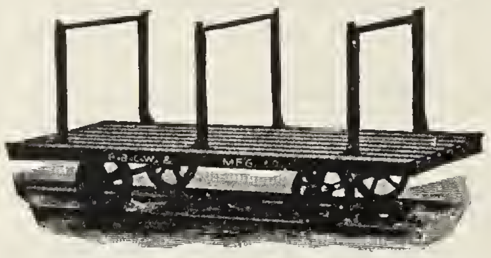
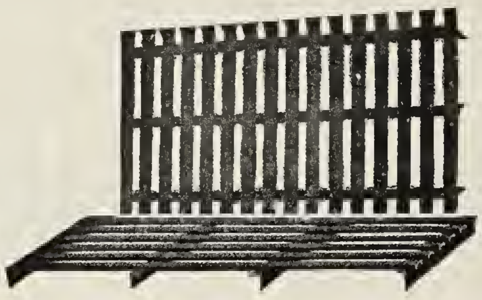


No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

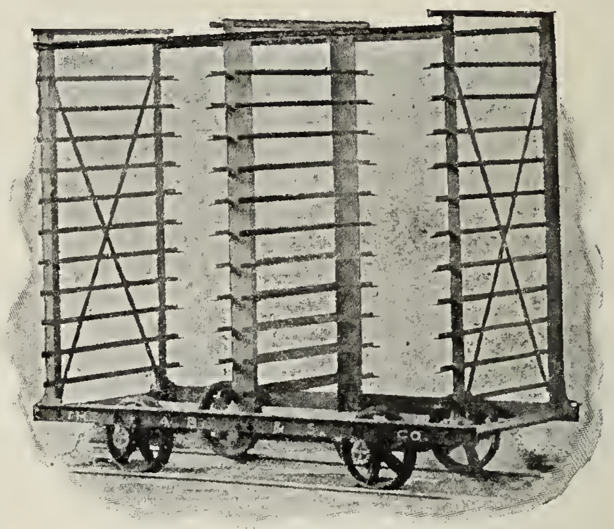
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

A Ladies' Clipper

CLIPPER
BEVEL GEARED
TRADE MARK
BICYCLES

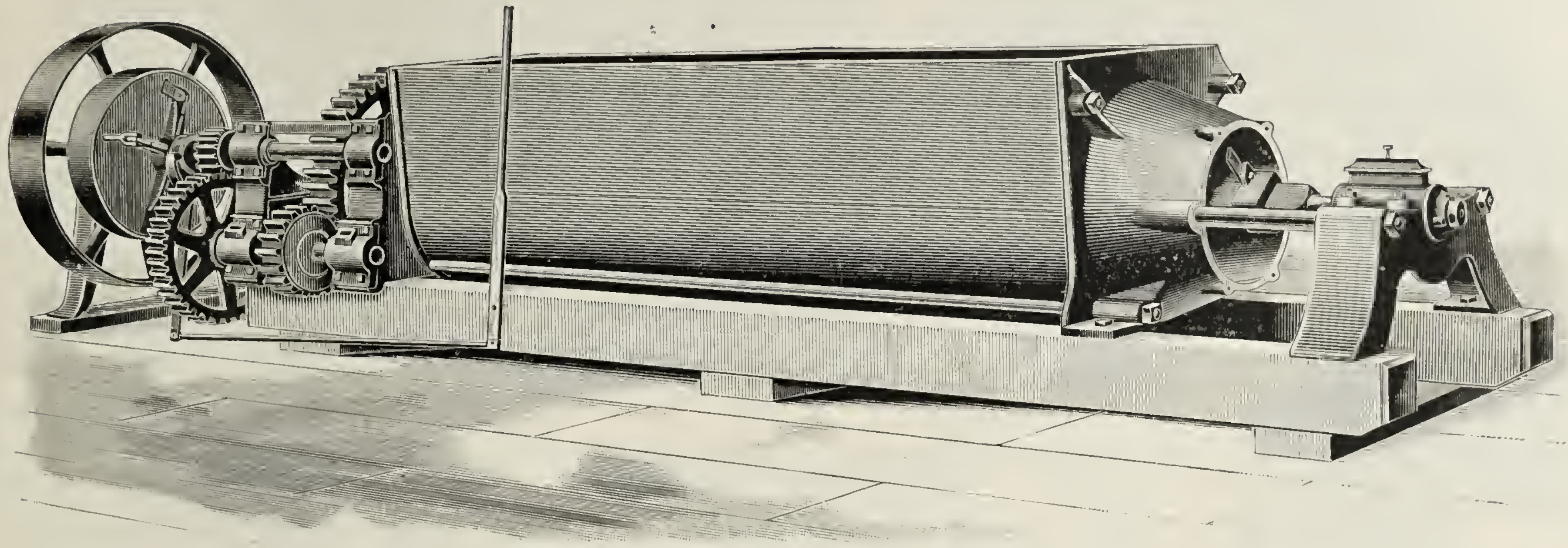
Bicycle never fails to please its owner. We take special pains to make all ladies' bicycles what they ought to be at the price they ought to pay. Our Ladies' Special Model 41 and the Clipper Chainless for ladies were designed for us by a Michigan lady rider of 10 years' experience. She knew what was wanted by the ladies, and the result is, we've sold thousands of ladies' bicycles.

We can fit any lady at any price from $75.00 down. Write us for our Bargain prices on Ladies' Wheels. ☞Send for Catalogue No. 3.

GRAND RAPIDS CYCLE CO.,

"Clipper People," Mich.

A GOOD THING.



Leader Pug Mill, Size No. 9.

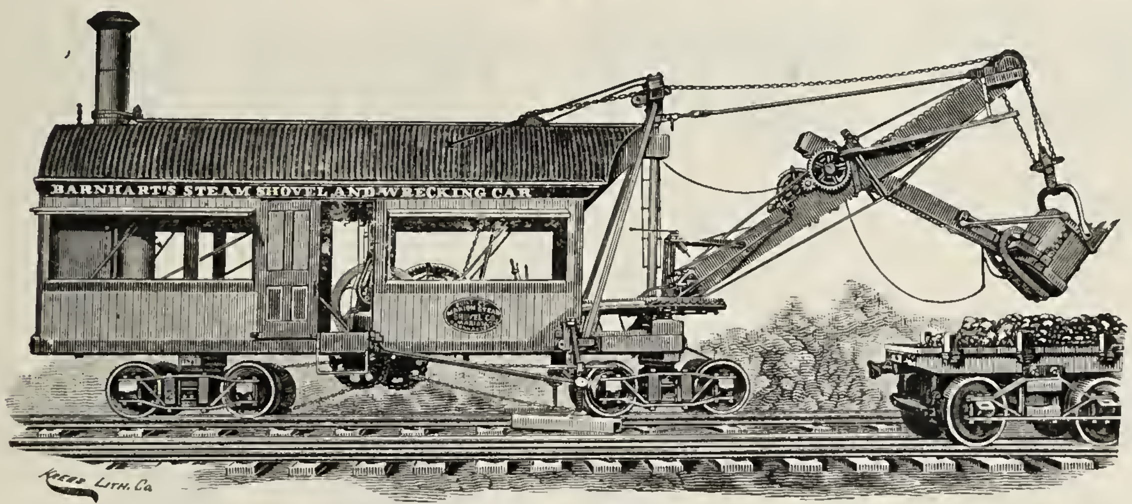
Send for circulars of our **Leader Machinery.**

Brick Machines, Pug Mills, Crushers, Disintegrators, Automatic Cutters, Etc., Etc.

LEADER MANUFACTURING CO., Decatur, Ill.

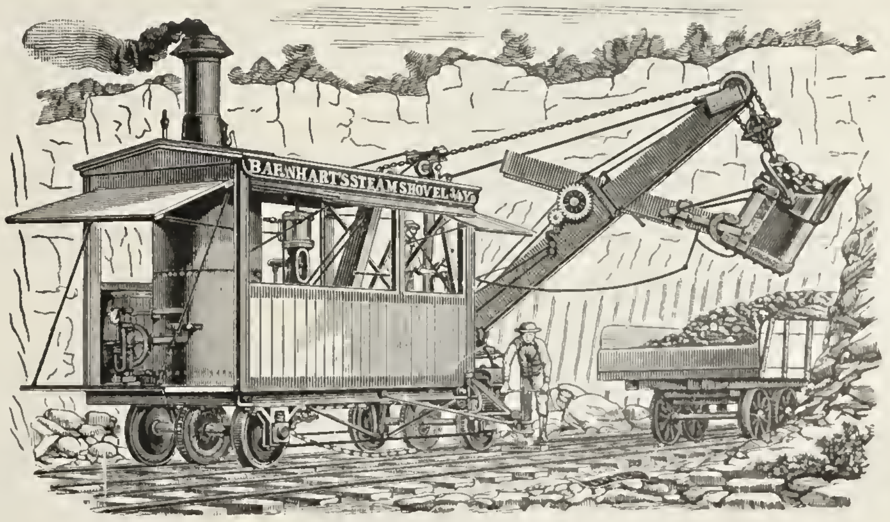
Steam Shovels for Brickyards.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.


BARNHART'S STEAM SHOVEL AND WRECKING CAR
Kress Lith. Co.

STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

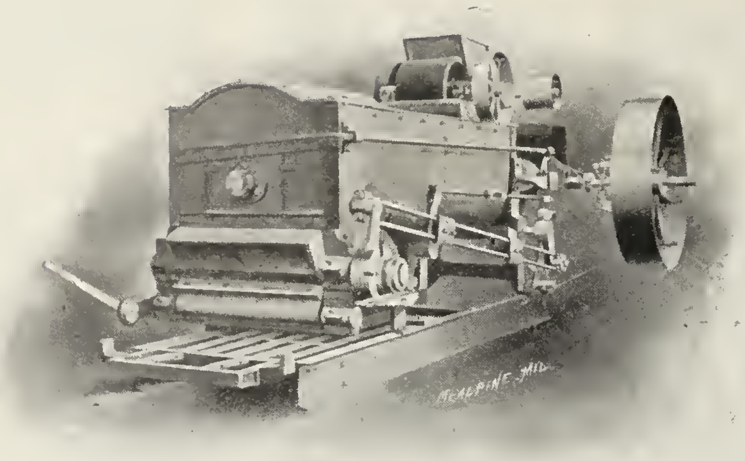


STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

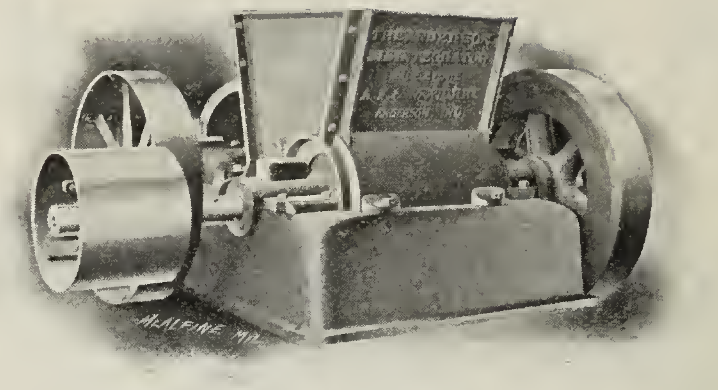
603 West Center Street, - **MARION, OHIO.**



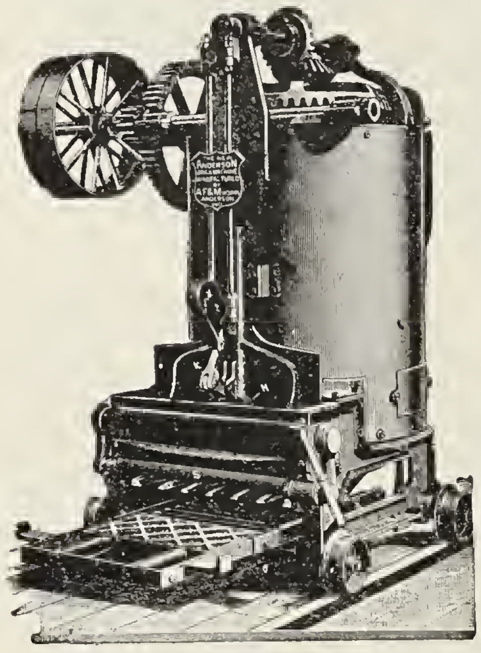
Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



Best Disintegrator on the Market.



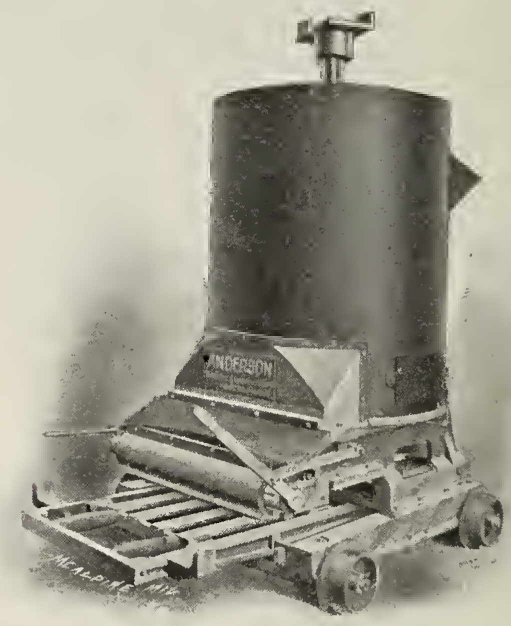
Steel and Iron Upright Stock Brick Machine.

MANUFACTURERS OF . . . .

New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,
And all Brickyard Supplies.



1899 Horse Power Machine.

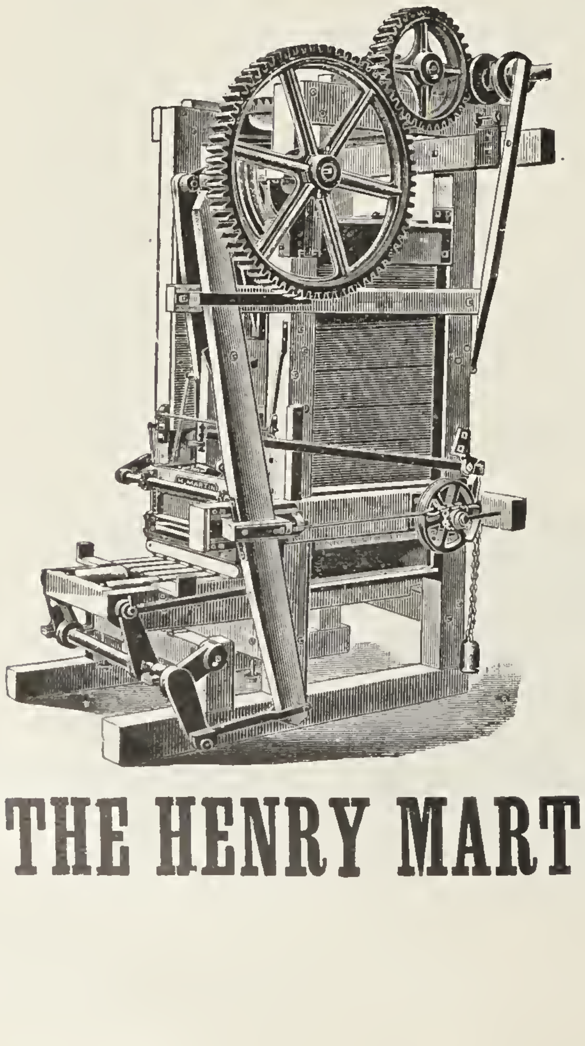
The Anderson Foundry and Machine Works,
Anderson, Ind.

60,000 First Class Soft Mud Brick in 10 Hours

ON A

"MARTIN" STYLE "A" STEAM POWER BRICK MACHINE,

Is the record of one of our Customers in Philadelphia, Pa.



Another in Oregon says:

"Your machine is King of all."

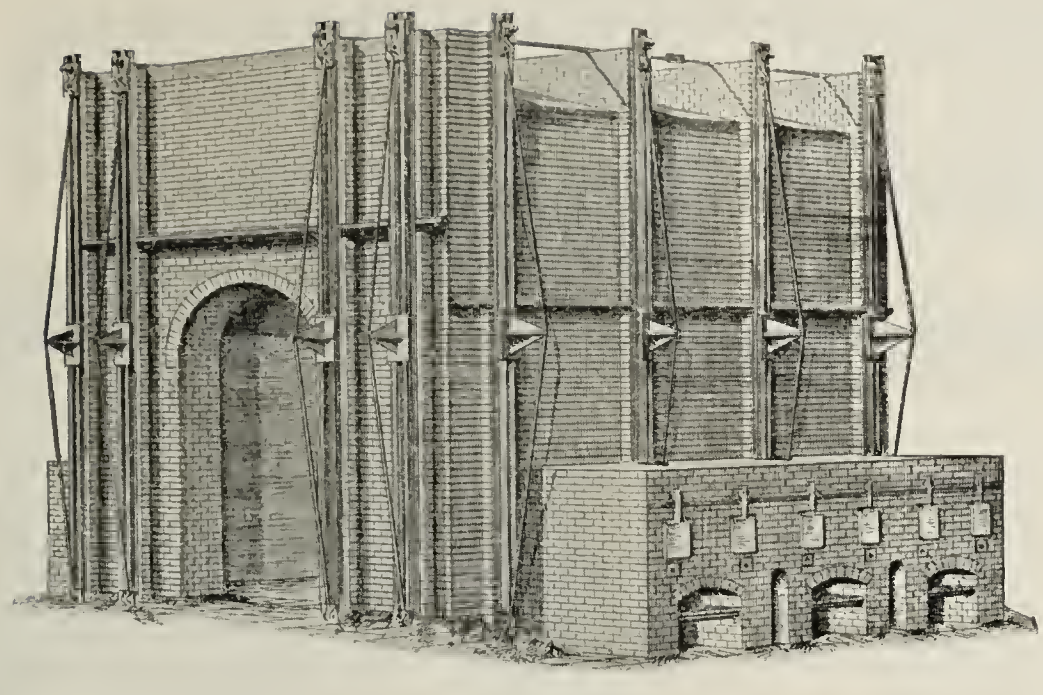
Still another in Nebraska:

"Have just secured a contract for 2,000,000 brick and distanced all competitors; not in price but quality. Thanks to the "Martin."

Many Others are Equally as well Satisfied.

Our catalogue sent on request.

THE HENRY MARTIN BRICK MACHINE MFG. CO., LANCASTER, PENN., U. S. A.



PATENTED.

The GRATH IMPROVED.... DOWN=DRAFT KILN

With Gas and Coking Furnaces Attached.

This kiln will burn a larger percentage of face, also vitrified brick, than other kiln in the market.

The GRATH KILNS are in use at the works of the American Hydraulic Press Brick Co., Collinsville, Ill.

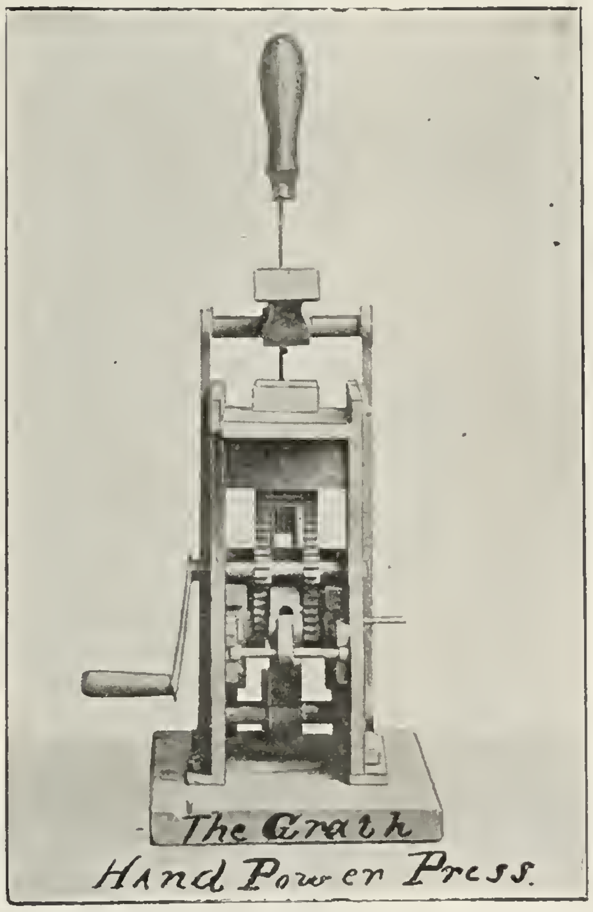
The Grath Gas and Coking Furnace

Is the Simplest, Best and most Durable Coking Furnace in the Market. Can be attached to either **Down** or **Up** Draft kilns and is guaranteed to give satisfactory results.

* * *

The Grath Dry or Semi=Dry Clay Hand=Power Press

For plain or ornamental press brick, The only successful press of its kind in the market. Simple, durable and powerful. No brickyard complete without this press.



The Grath Hand Power Press.

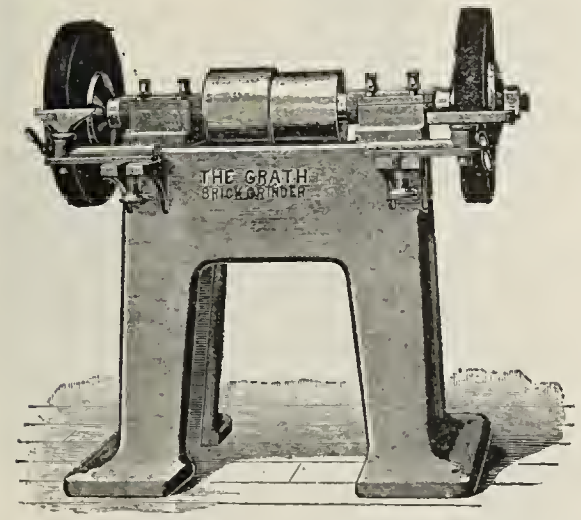
* * *

The Grath Brick Grinding Machine

For grinding Arch and Radius Brick of any hardness, even to a Vitrified brick. Simplest and Best in the market. No sand, no discoloration, which means satisfaction.

The Cheapest Grinding machine in the market

In use by American Hydraulic Press Brick Co., Collinsville, Ill.



* * *

Simplicity and Durability,

IS OUR MOTTO.

* * *

FOR FURTHER INFORMATION ON ABOVE, ADDRESS

The ILLINOIS SUPPLY & CONSTRUCTION CO.,

St. Louis, Mo.

The Standard of Excellence.

The evidence of merit is when a customer buys a second time; —we have dozens of this kind of customers.

Did you ever count the cost of a machine that only lasts a few years and then goes into the machinist's hands for continual repairs.

The first Eagle Represses sold a dozen years ago are today in constant use and are doing good service. Scarcely one of them has cost anything for repairs. Ask the users. The Eagle is built of the very best material. No expense is spared to get the finest results. That's why the longer you use them the more profit you make on the money invested in them.

The movement in the Eagle is the ideal one to secure speed, pressure, and insure life. No vibration. No elasticity. No wear.

We make no preposterous claims but fulfill every promise and more. We give all the speed that can be utilized and more product of a better quality than any other press in the same number of hours. Look up the records and convince yourself.

It is the easiest to operate because of simplicity.

It gives more and better product because of its rigidity.

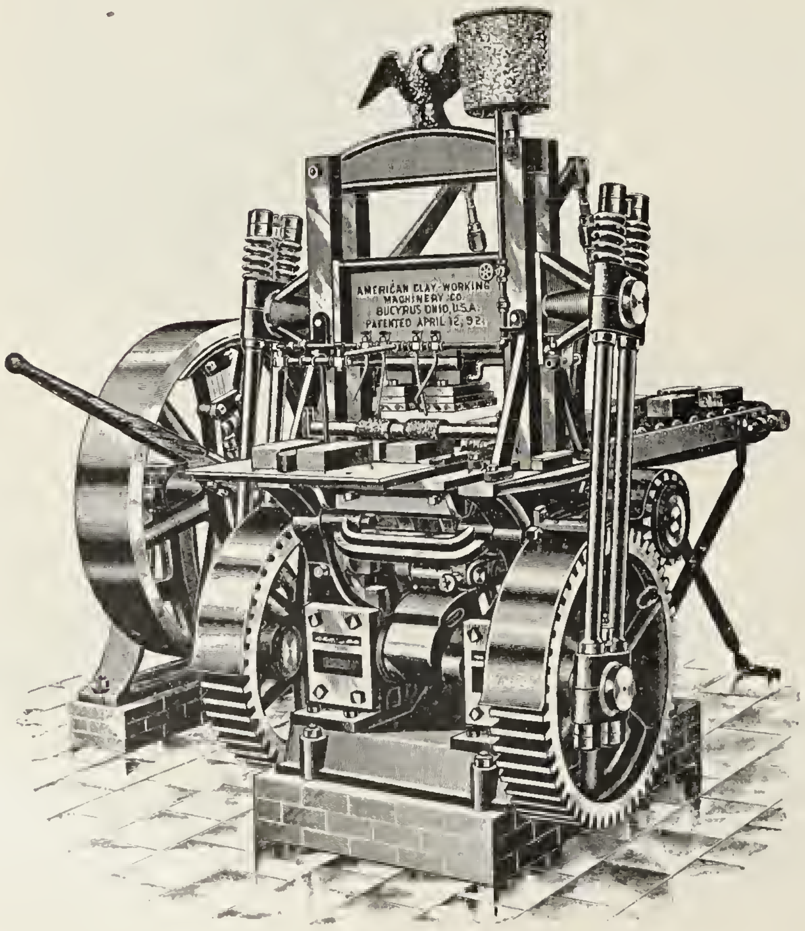
It has more life because of its correct and superior movement and faultless construction.

It is cheapest because it lasts the longest.

It costs very little to investigate the merits of this press, and it may save you much in expense and worry.

Send us a postal and we'll deliver full particulars free of charge. If you want to buy at once, we'll send a man.

We build a full line of machinery for the manufacture of all classes of clay products and we build them right.


AMERICAN CLAY-WORKING MACHINERY CO.
BUCYRUS OHIO, U.S.A.
PATENTED APRIL 12, '92

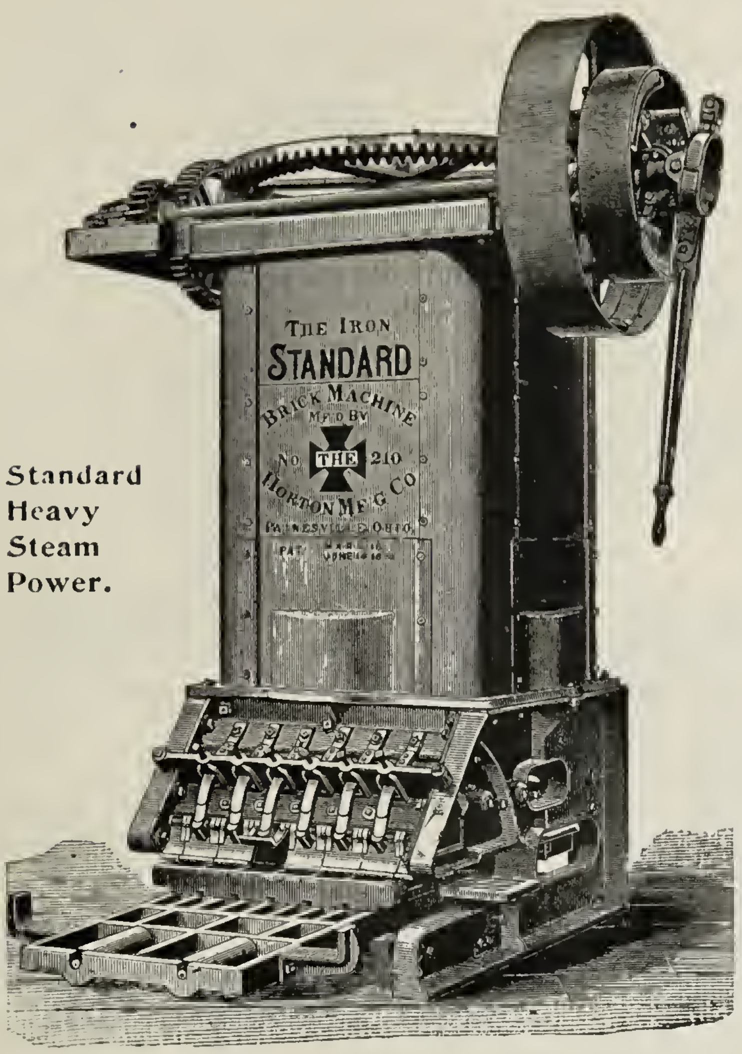
The American Clay-Working Machinery Co.,

THE MACHINERY THAT NEVER DISAPPOINTS

BUCYRUS, OHIO, U. S. A.

We Lead! Others Follow!

• • •



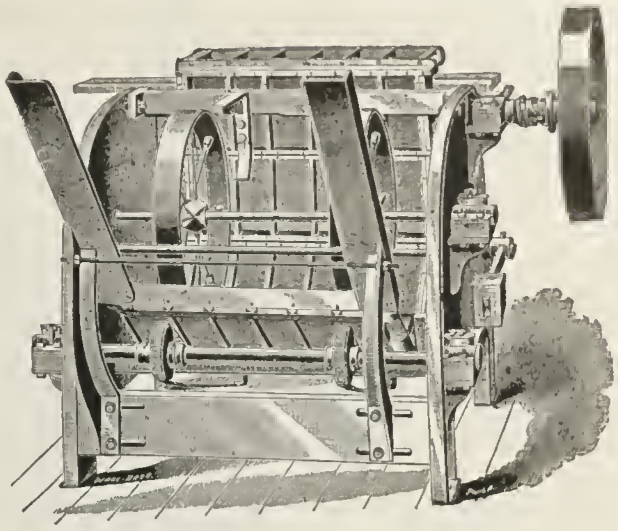
Standard
Heavy
Steam
Power.

The Hercules!

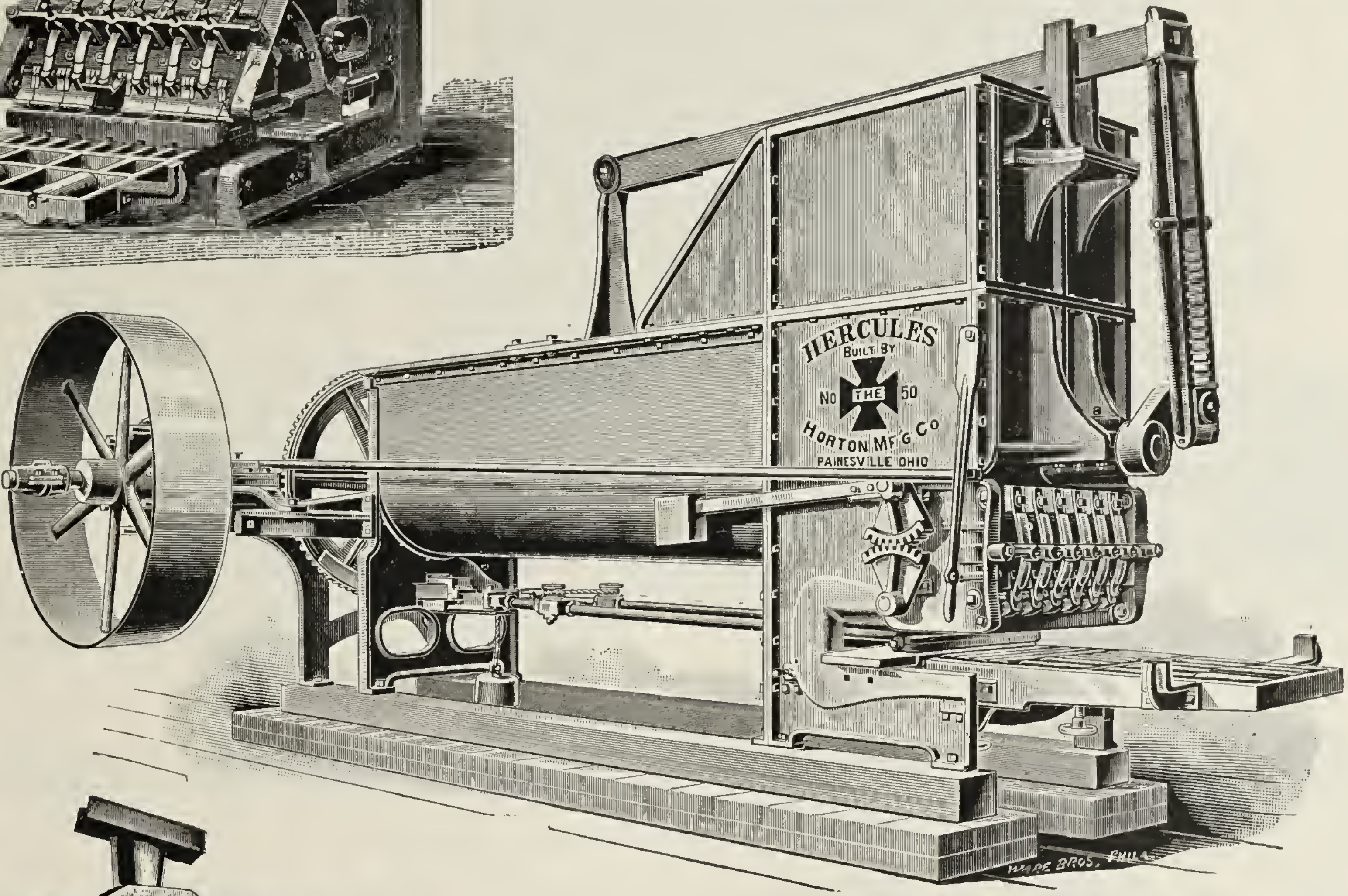
Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

The Standard Machine is just what its name implies.

SEND FOR
1899 CATALOGUE.

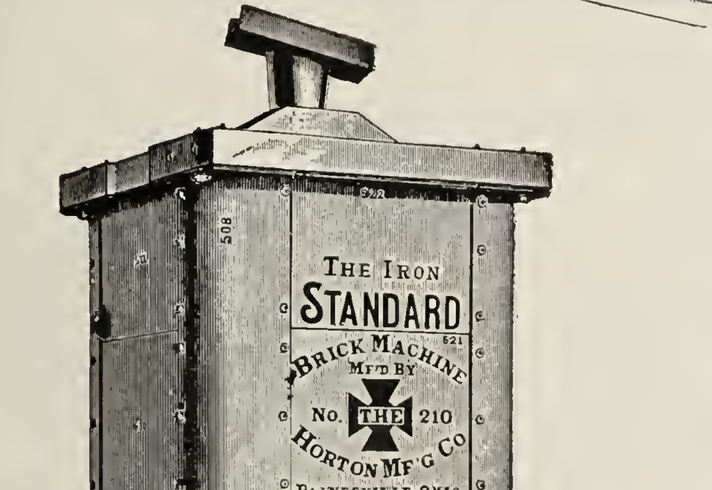


HORTON MOLD SANDER DIRECT FEED.

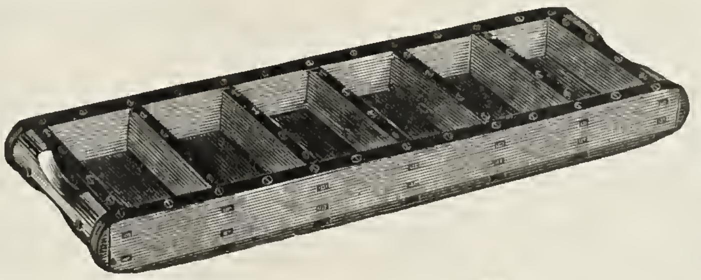


Hercules capacity 40,000
to 50,000.
Weight 15,000 pounds.

We are making a special drive on Molds this season. Send for our new circular on molds



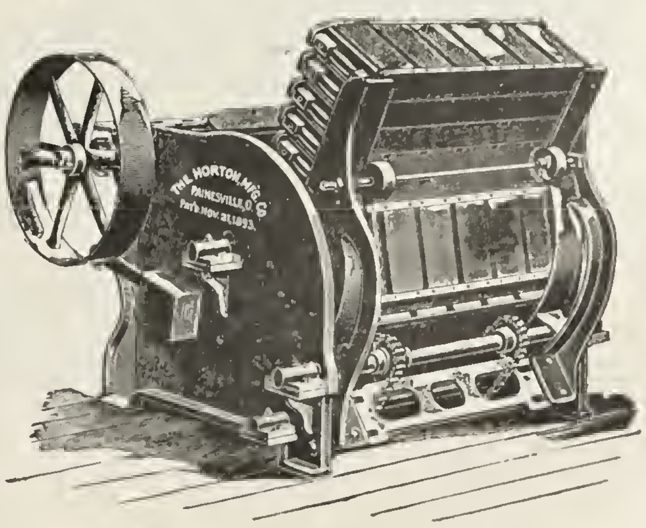
IRON STANDARD HORSE POWER.



WE HAVE recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.

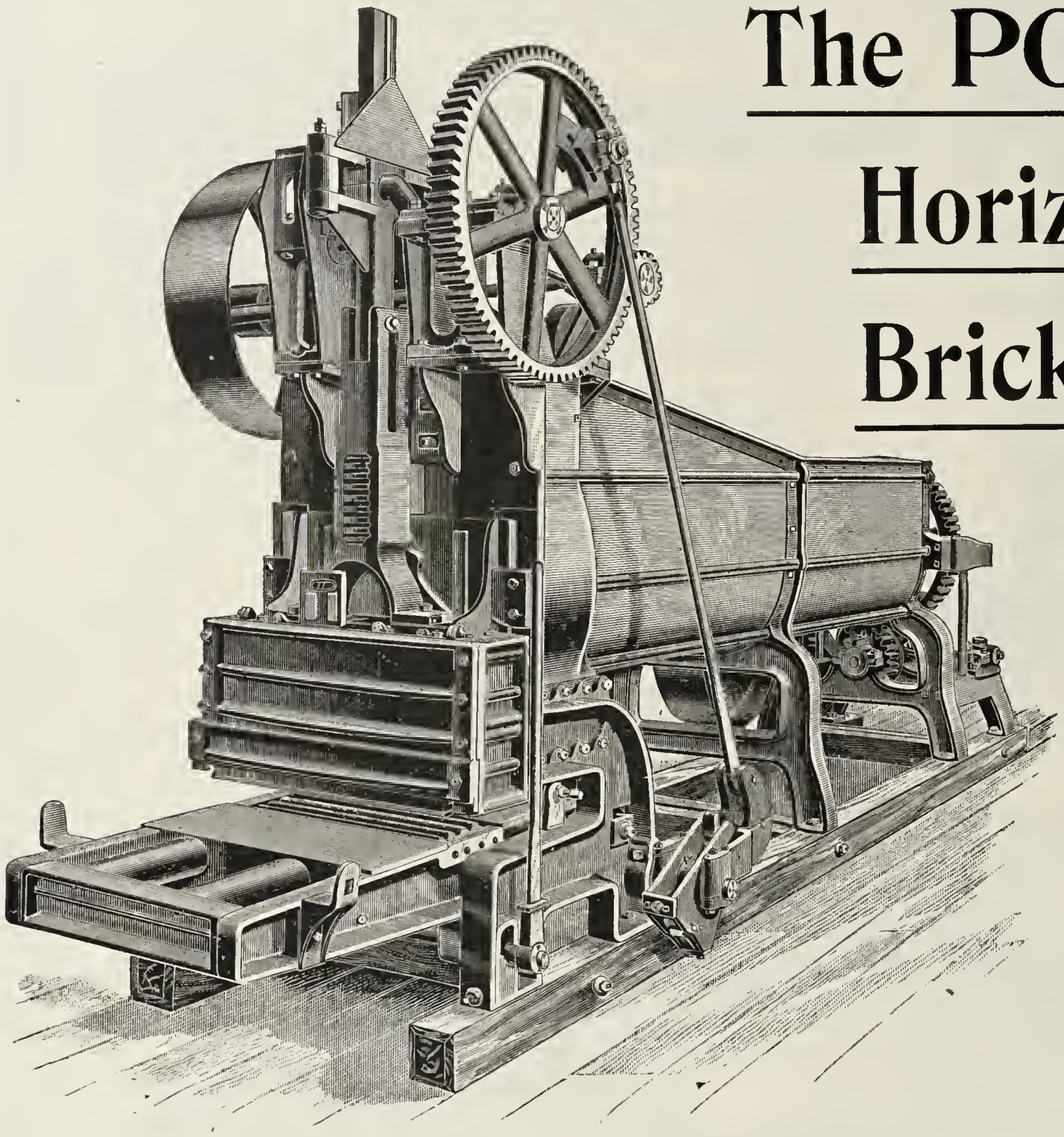
The HORTON MANUFACTURING COMPANY,

PAINESVILLE,
OHIO.


THE HORTON MF'G. CO.
PAINESVILLE, O.

THE AUTOMATIC FEED MOLD SANDER.

We make a Specialty of erecting Complete Soft Mud Plants.



The POTTS Horizontal Brick Machines,

DISINTEGRATORS

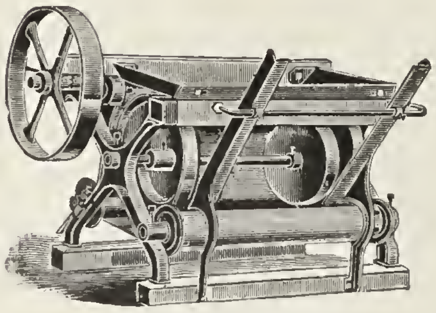
....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

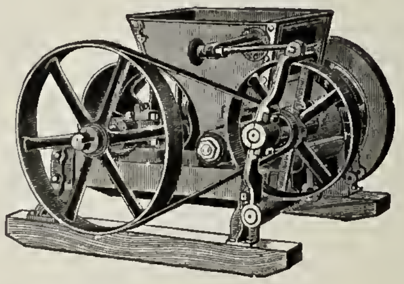
The best built, heaviest and strongest Machinery made.



MOULD SANDERS.

WE MANUFACTURE EVERYTHING NEEDED ON THE BRICKYARD.

WE MAKE A SPECIALTY OF BRICK MOULDS.



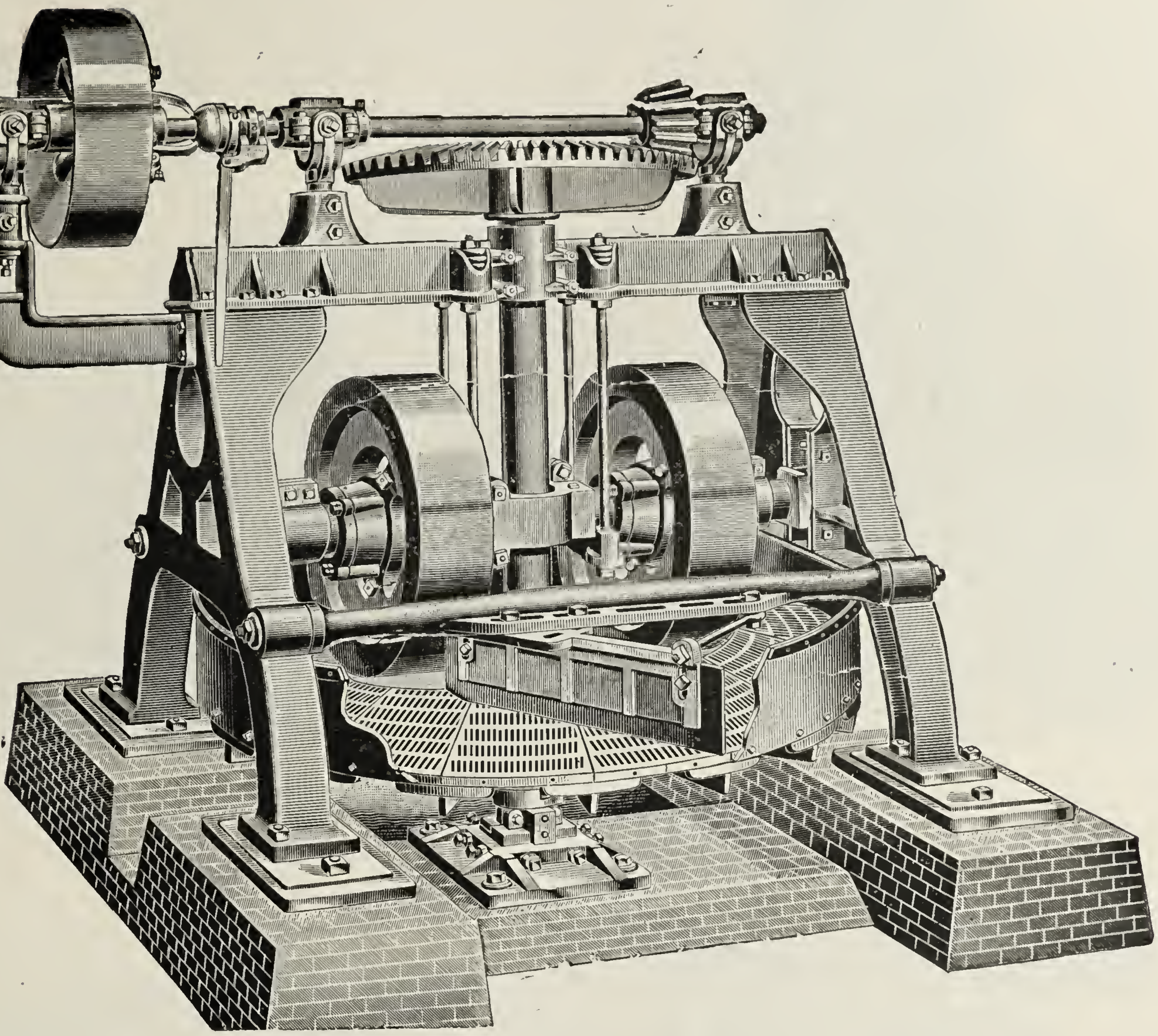
DISINTEGRATORS.

When in need of Machinery or supplies, we can save you money.

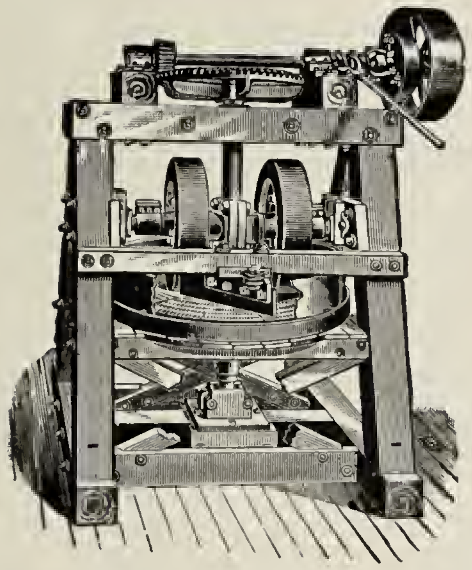
C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE
JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

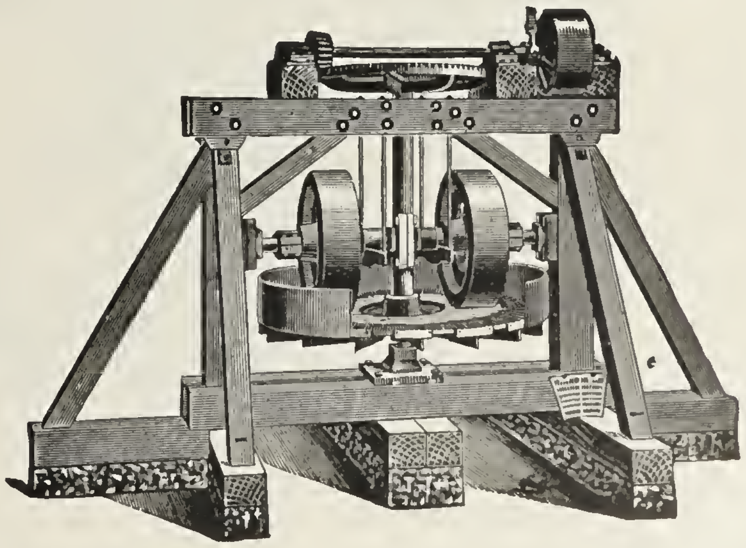


OUR SPECIALTY IS **DRY PANS.**



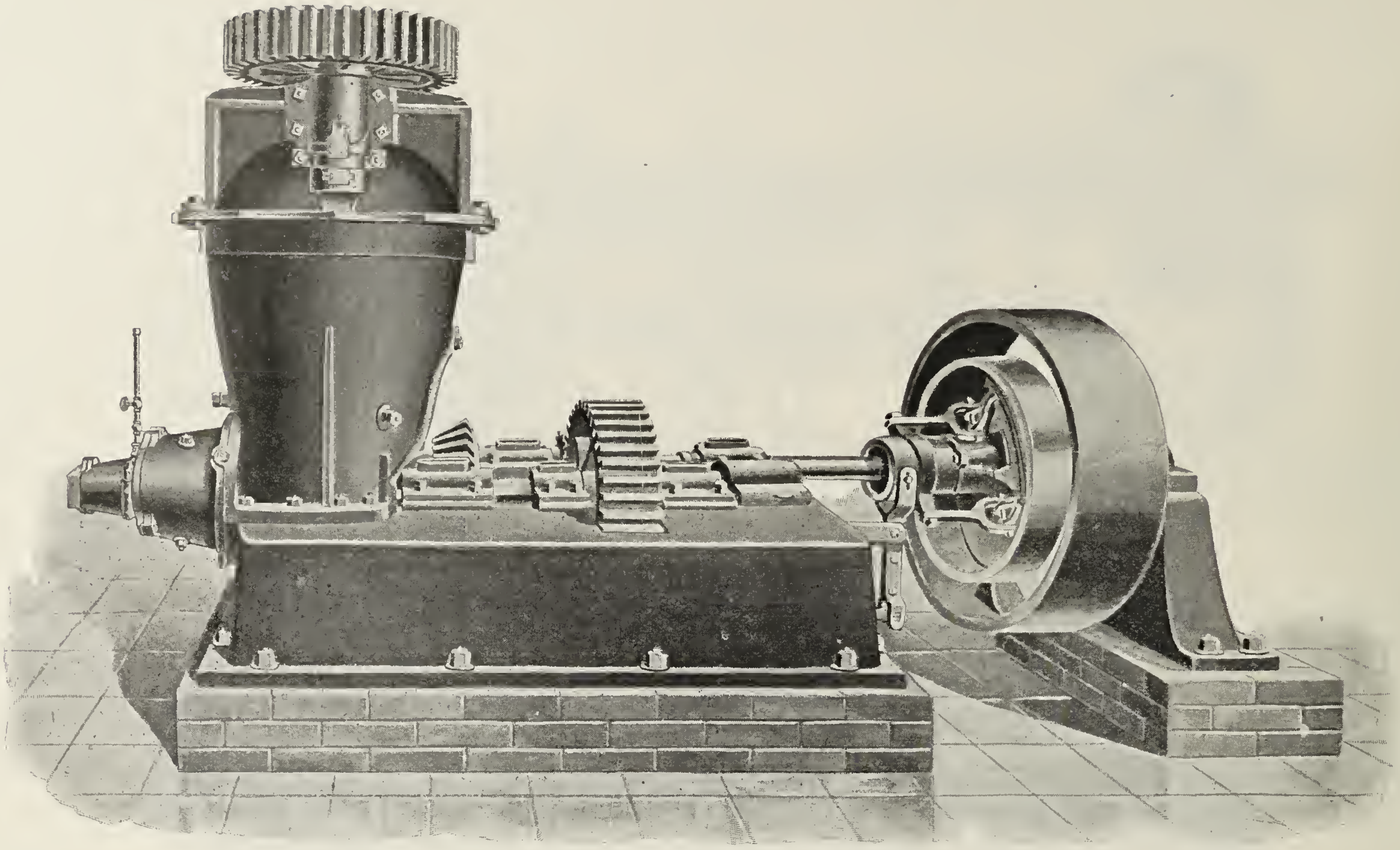
IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.

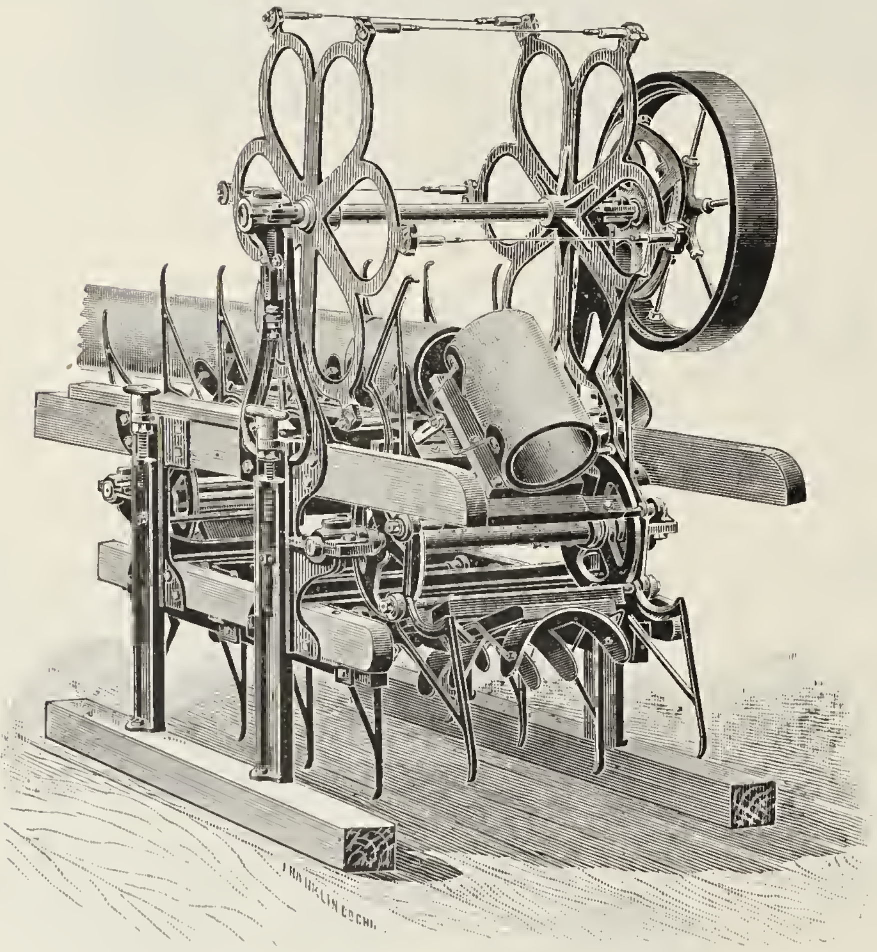


......SEND FOR NEW ILLUSTRATED CATALOGUE......

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.



Brewer No. 10. Daily capacity 50,000 to 80,000 Brick.


FRANKLIN ENG. CHI.

Automatic Tile Cutter.

Naperville, Ill., Jan. 24, 1898.

H. BREWER & CO., Tecumseh, Mich.:

Dear Sirs—In answer to your inquiry, it gives us great pleasure to say that your Automatic Tile Cutter we bought about one year ago, along with the No. 9 A machine, is ALL RIGHT, just as you represented it. With it we have been able to put from 15,000 to 18,000 three-inch tile on the floor in 10 hours. The tile are cut true; very few have to be thrown back. There is no doubling up of tile in the troughs when clay runs a little softer than it ought to be; the little belt which drives the reel prevents this and helps to keep the troughs moving. The pressure on the cutting wires being always in the same direction, makes them last a long time. Clay can also be run quite soft and the tile retain their perfect form. We think your Automatic Tile Cutter is nearly perfection. We are well satisfied with it and could not think now of running our works again without it. Wishing you much success, we remain

Yours truly,

MARTIN & VONOVEN.

H. BREWER & CO.,

Tecumseh, Mich.

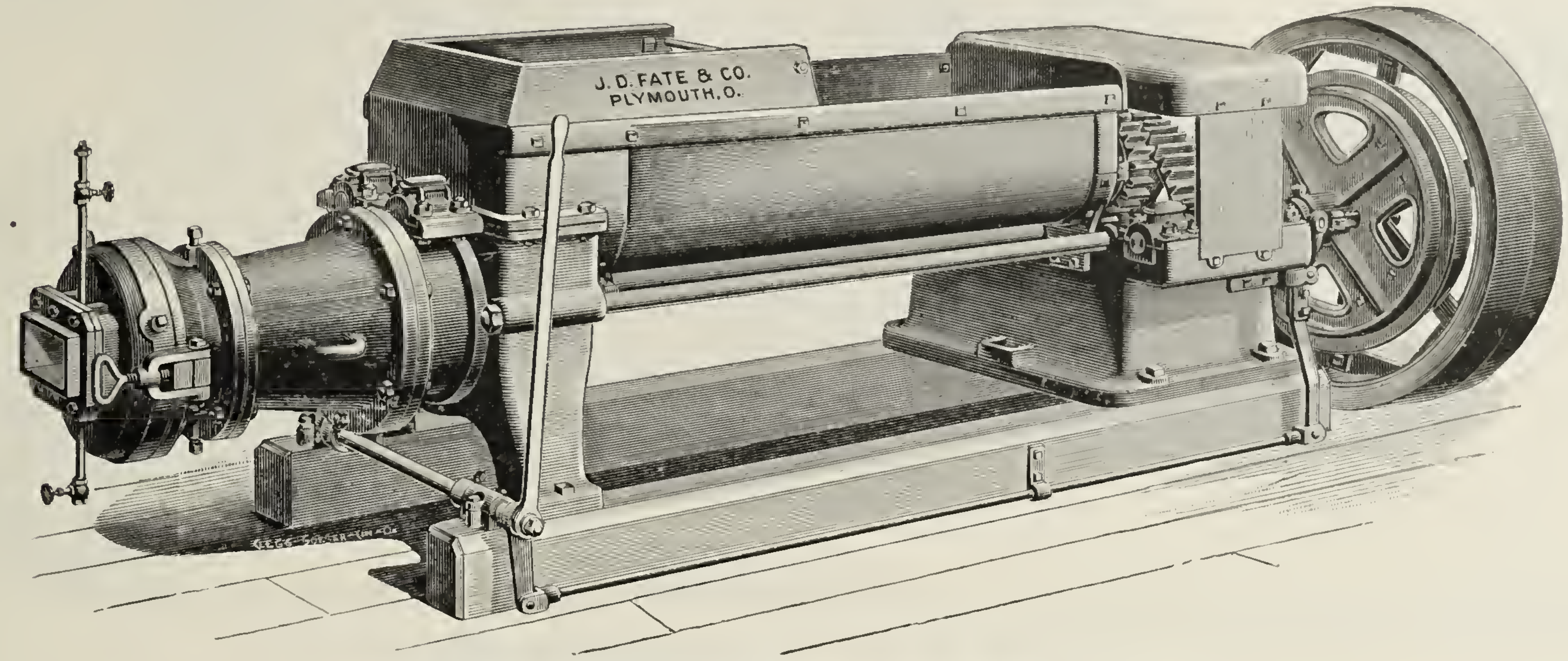
J. D. FATE & CO.,

Manufacturers of

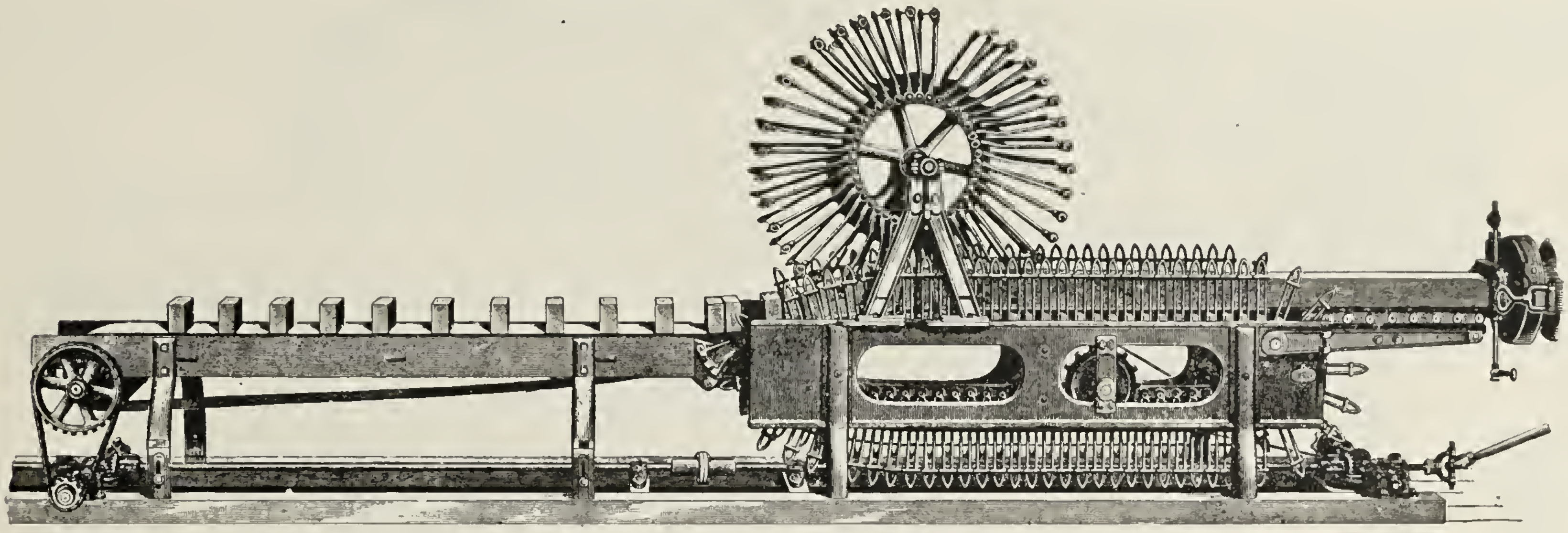
BRICK AND TILE MACHINERY.

PLYMOUTH, OHIO.

Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.



"HUMMER" COMBINED PUG MILL AND BRICK MACHINE.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.

Des Moines, Iowa, May 11th, 1899.

J. D. FATE & CO., Plymouth, Ohio.

Gentlemen:—We are so well pleased with the Automatic Side-cut Brick Machine that we purchased from you this Spring that we feel it our duty to send you a testimonial. We feel safe when we say it has no equal, but we are sure when we say it has no superior, because it is perfect when it comes to making a nice, square brick. We have tried it in all kinds of clay that we have here, and it makes no difference, it runs just the same. We can now make a fancy face brick, which we could not do before. We do not use power to drive the wheel—the column of clay runs it nicely. We feel that it is the best investment we ever made. If you have any prospective customer in our neighborhood, send him to our yard to see the machine, and we will venture to say he will buy your machine.

Very respectfully yours, NEWMAN BRICK & COAL CO.

Correct in principle and mechanism.

Simplicity itself—nothing can get out of order unless broken by carelessness.

Strong and of long life—all its motions being continuously rotary.

The parts work together without jarring.

There is no halt or hesitation—every motion is prompt and positive.

Requires no expert to keep it running or in repair.

The column of clay, assisted by friction, runs the table, but all movements are regulated by clay column. When the column goes, table moves, and stops when it stops.

Breaks less than one-tenth the cutting wires that others do, and if wires are broken may be easily replaced without stopping.

The brick cut are square and true, with sharp edges and corners, and equal to the finest Press Brick.

The first brick is as good as the last, and the last as the first.

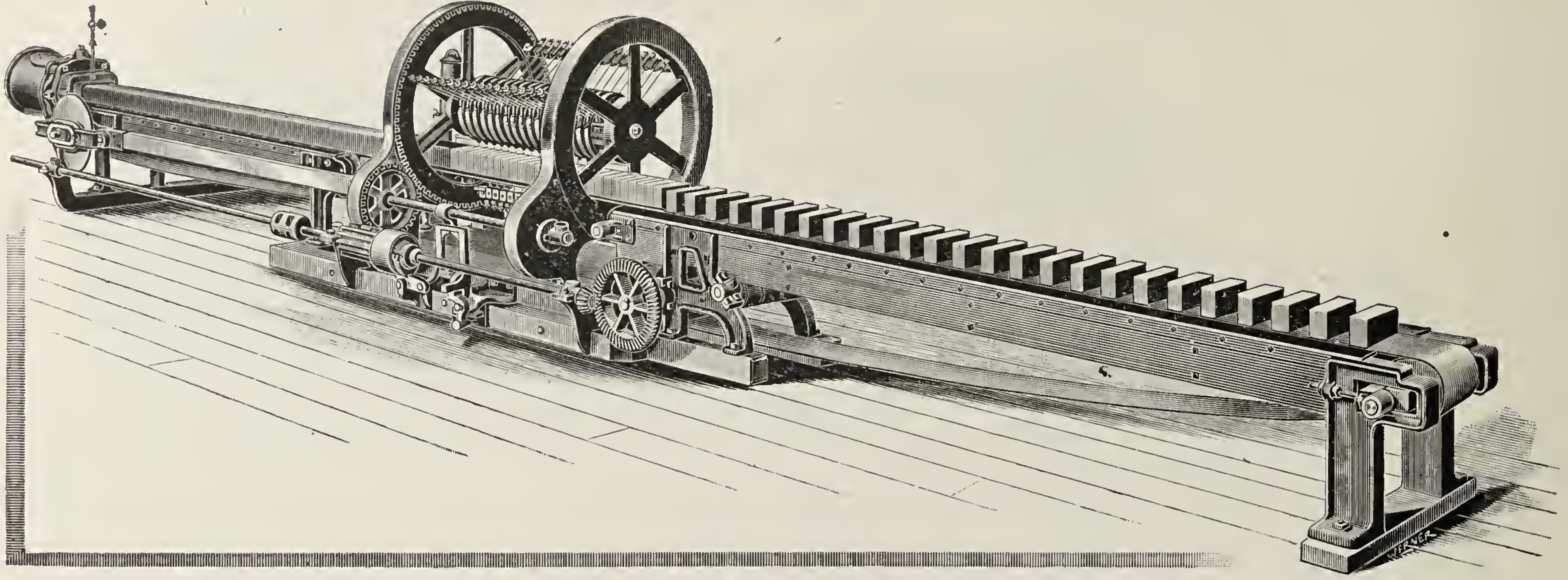
Cutting capacity practically unlimited.

"Soft Mud" Brick Machinery, both Steam and Horse Power in addition to our full line of "Stiff Mud" Machinery.

ASK FOR CATALOGUE AND PRICES.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



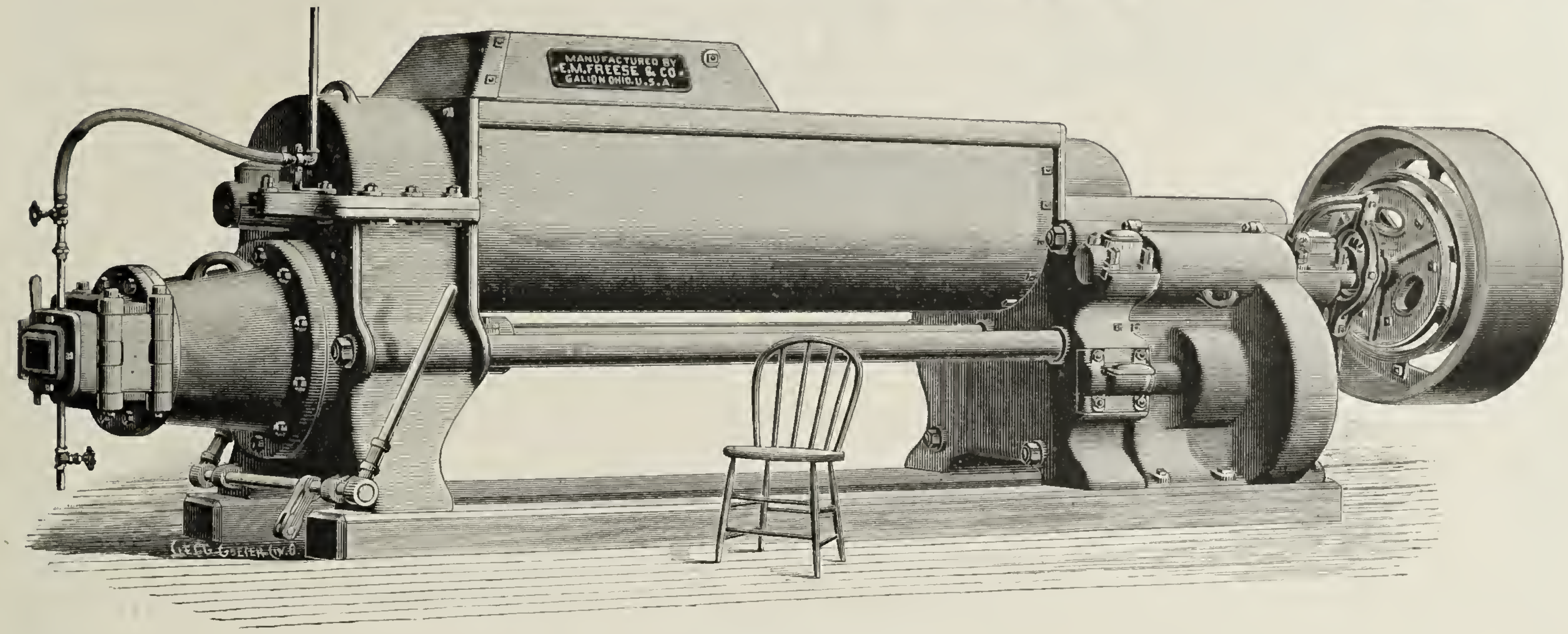
A New Rotating Cutter for Side Cut Brick.

POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

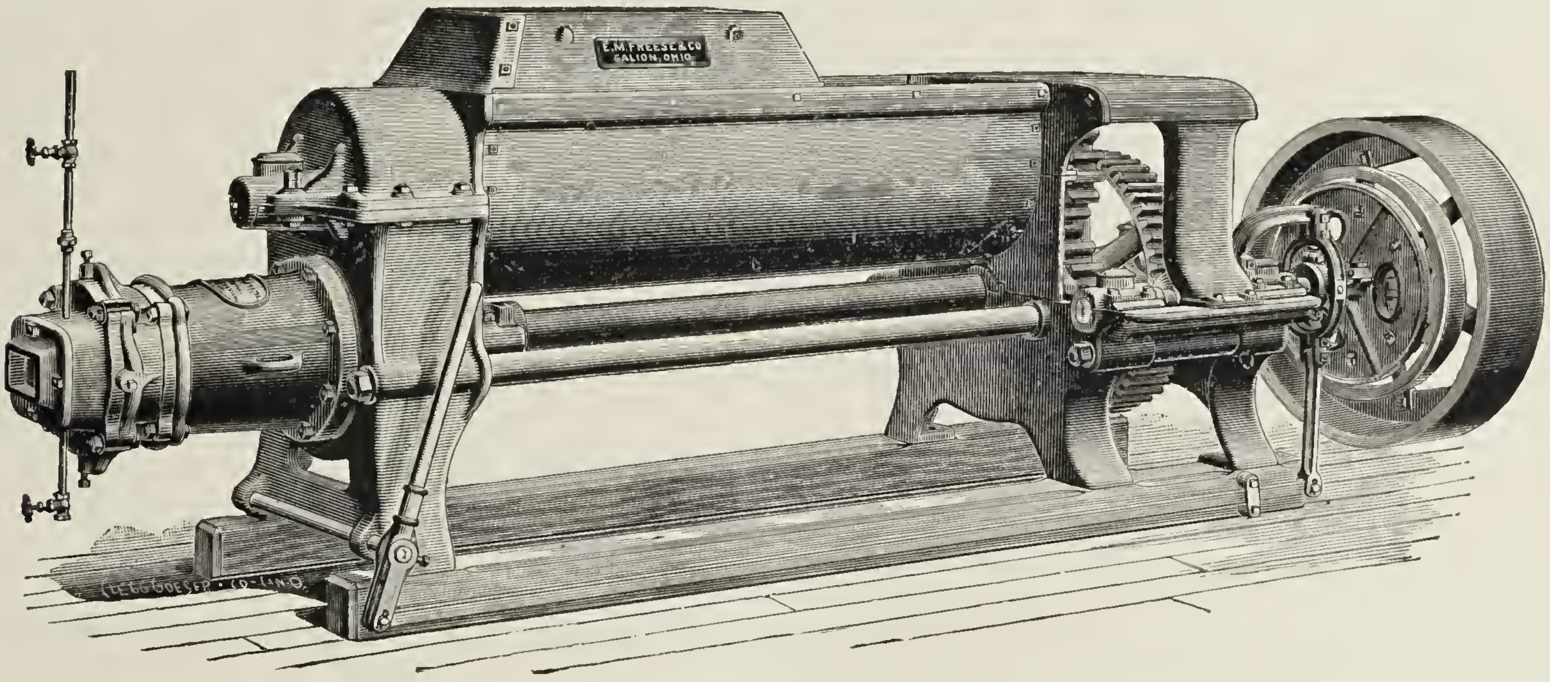
E. M. FREESE & CO.,
Galion, Ohio.

The Original Union Brick Machines


MANUFACTURED BY
E. M. FREESE & CO.
GALION OHIO. U.S.A.

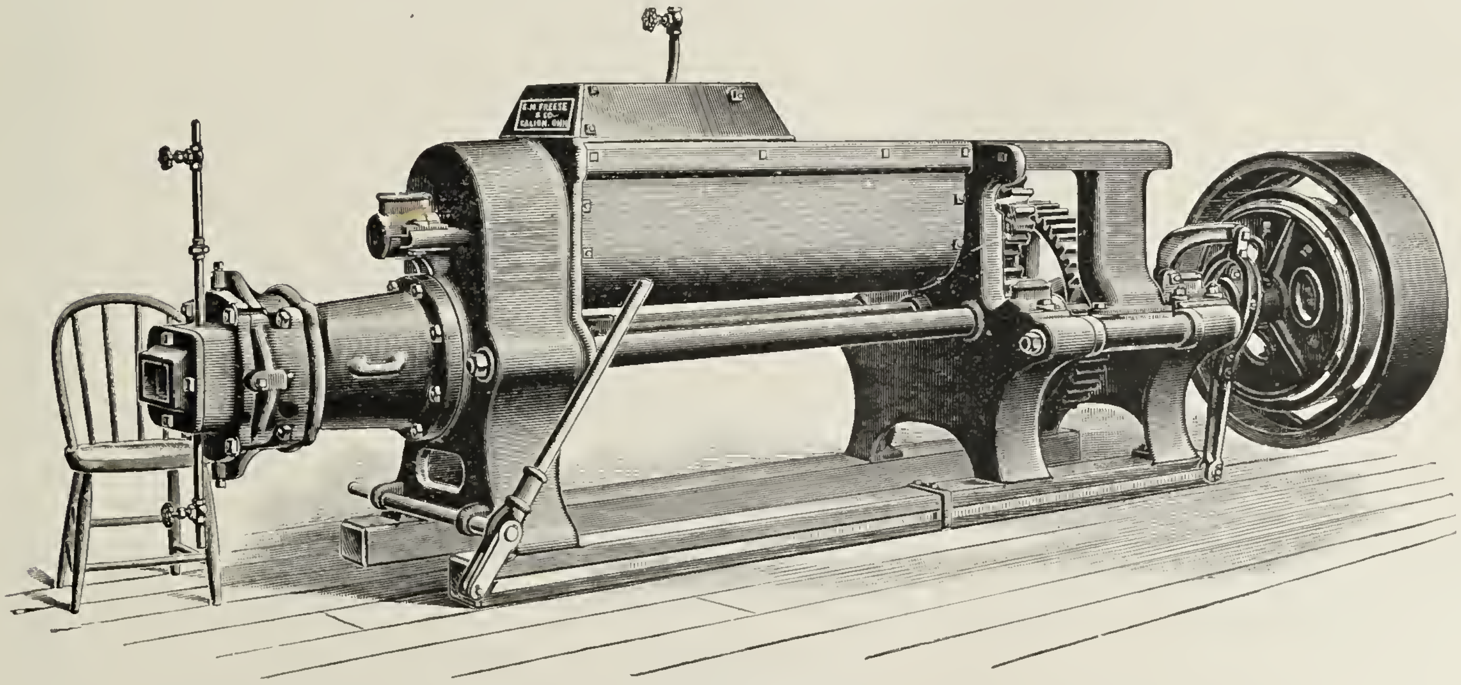
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

A Summer-Time Suggestion

TO ALL WHOM THESE PRESENTS SHALL CONCERN.

At this Season of the Year

Brickmakers are very apt to confine their efforts exclusively to making brick, and neglect almost everything else.

The Beautiful Summer Time

Is also the best season for some other things. To those whose machinery is unsatisfactory or worn out, we suggest that this season is best for investigation as well You can usually get a better idea of machinery by seeing it operate than any other way.

If You Intend to Buy

Before commencing another season, search out your machinery this Summer and buy it to be erected this Fall. Money will be saved by doing so. Just as good prices, and the most favorable terms will be obtained for fall delivery.

As Brickyards are Generally Located and Constructed

Repairs or additional construction can be made to better advantage in the Fall. Then the hurry and worry incident to belated Spring repair jobs, is prevented. Much work is done around a brick works in the Spring that would have been done better some other time.

IS OUR SUGGESTION WISE?

We believe your interests will be promoted by a careful examination of our "NEW HAVEN" BRICK MACHINERY.

The Eastern Machinery Co.,

NEW HAVEN, CONN.

DO YOU WANT THE

BEST BRICK DRYER?

THE CUMMER DRYERS

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel. It is a fuel saver and hence a money maker.

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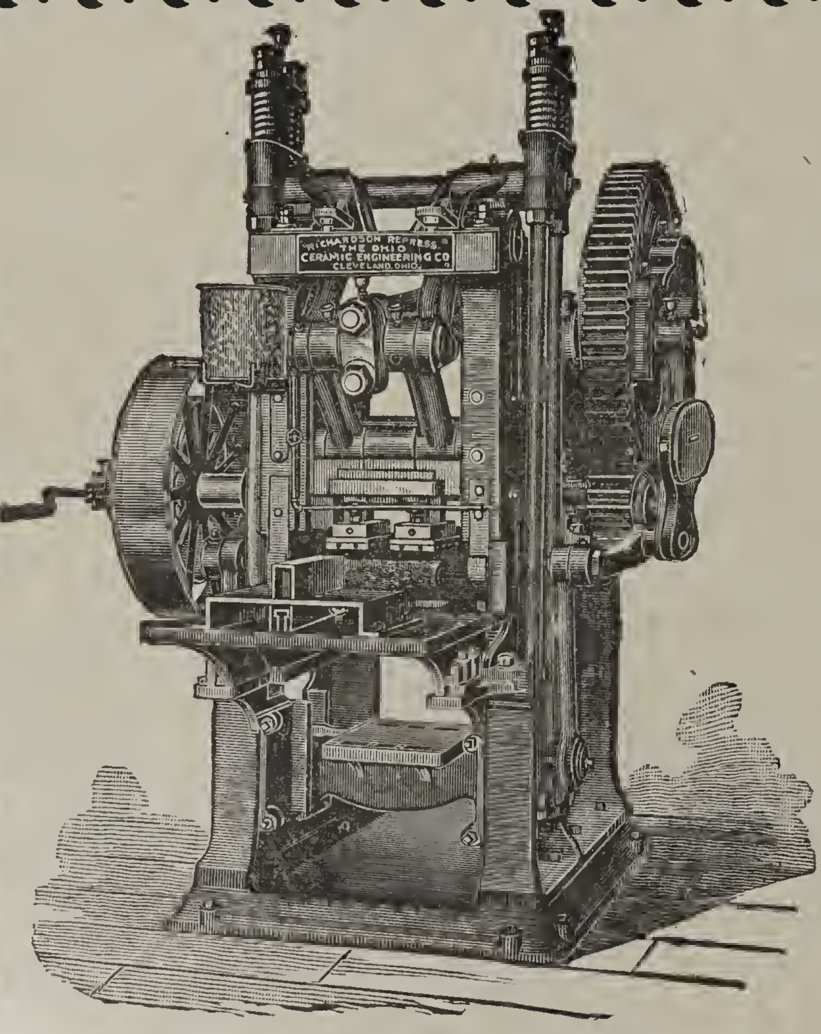

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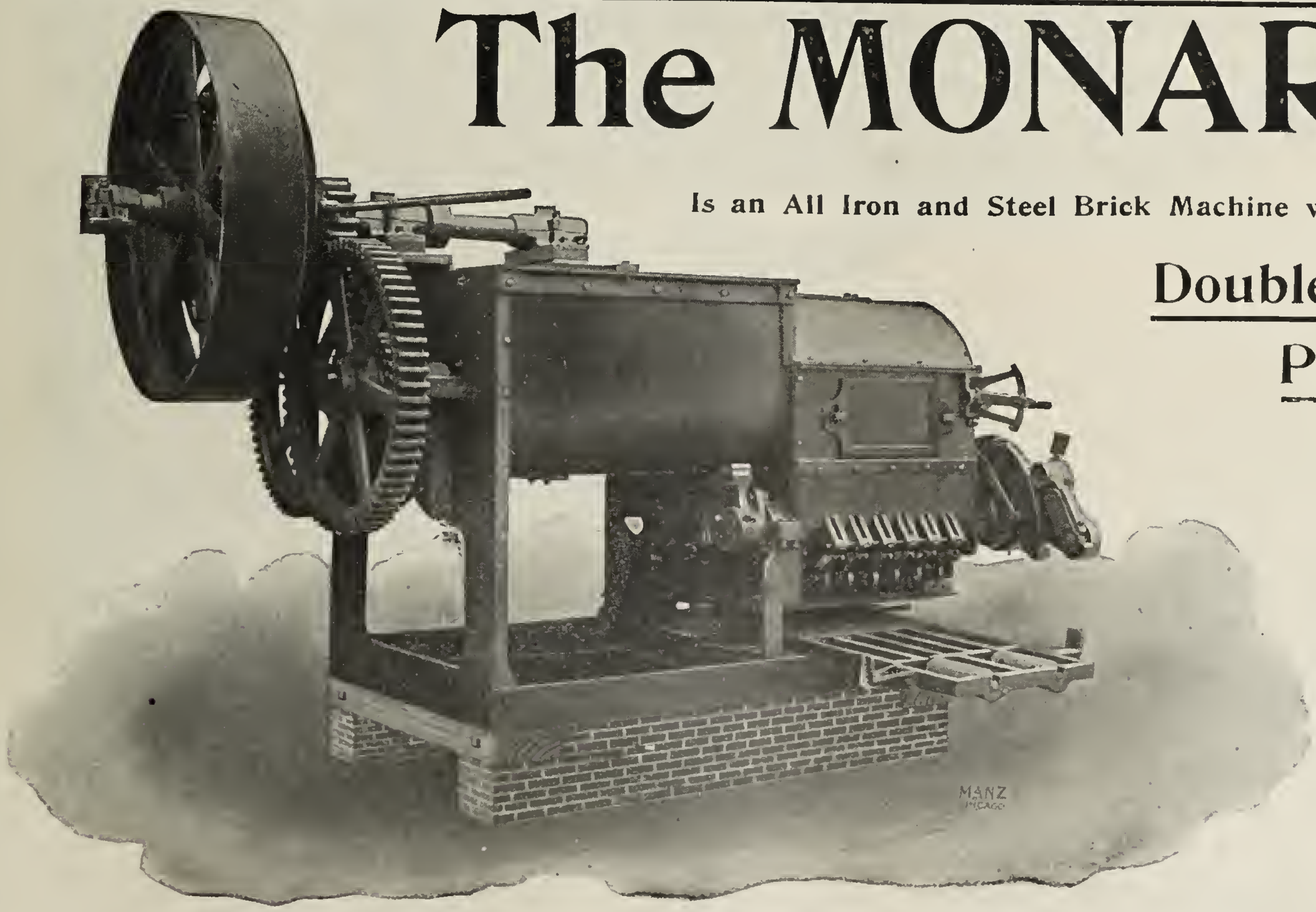

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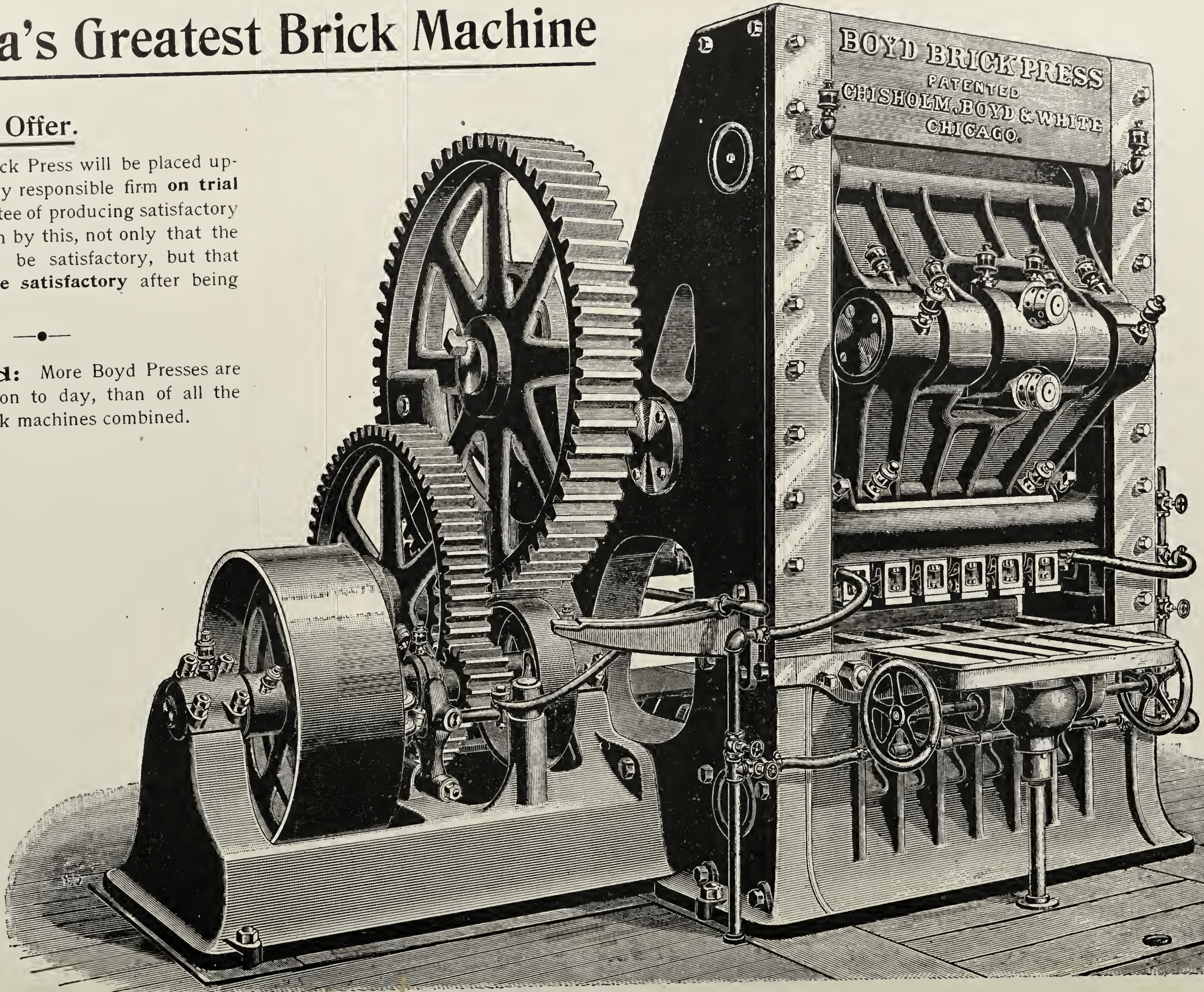

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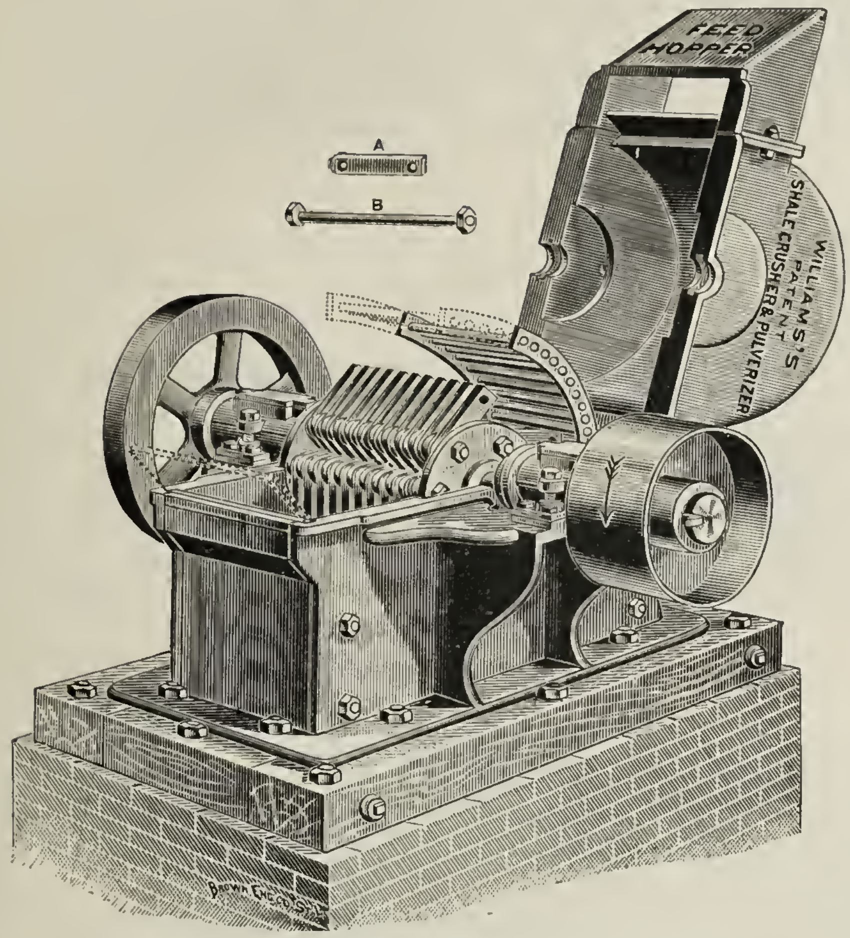

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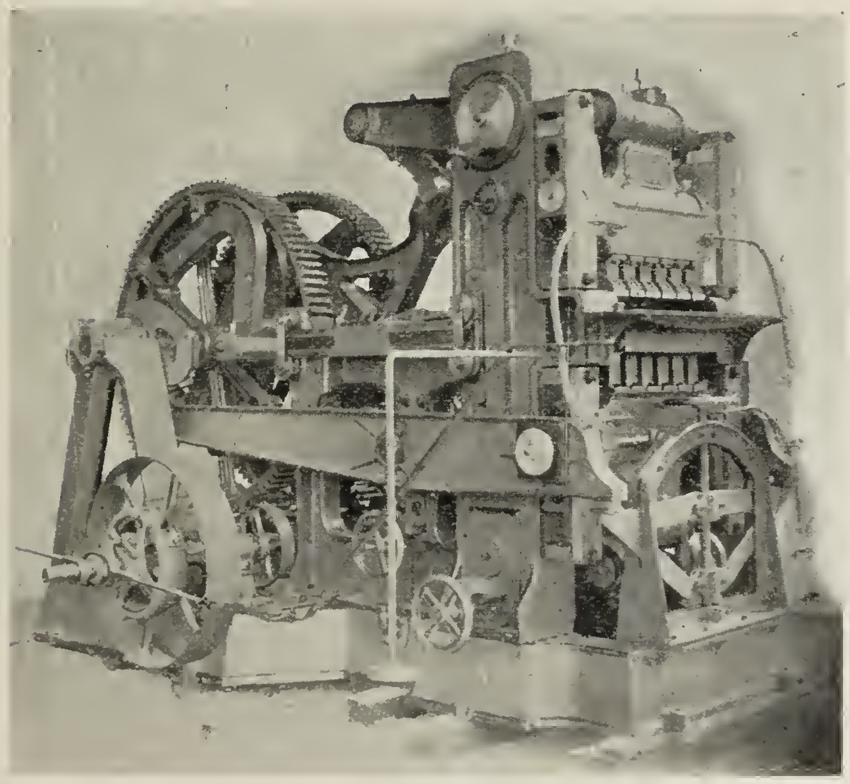

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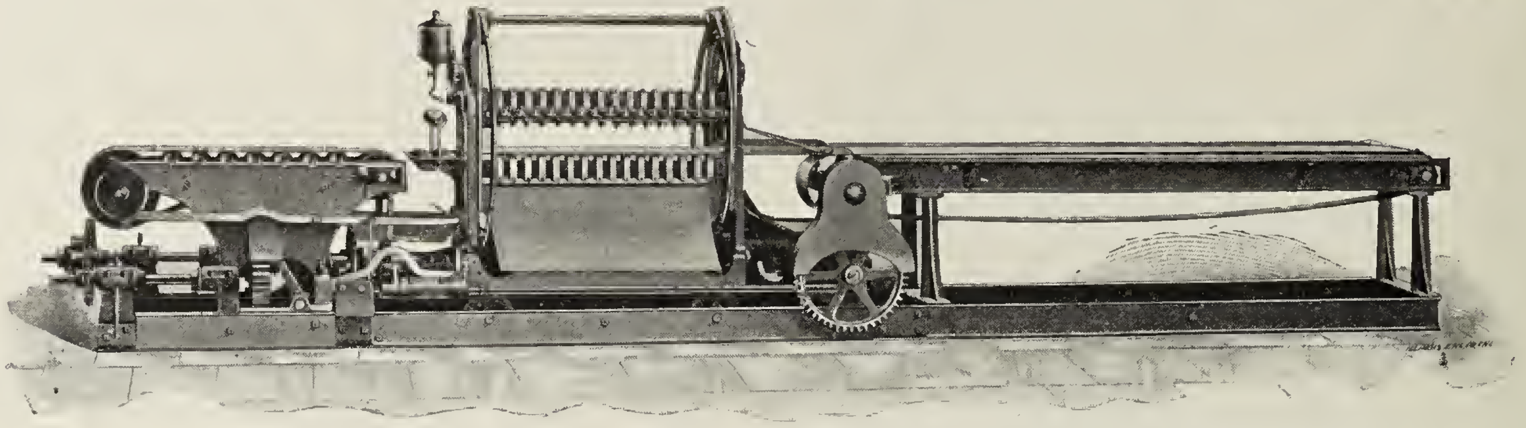

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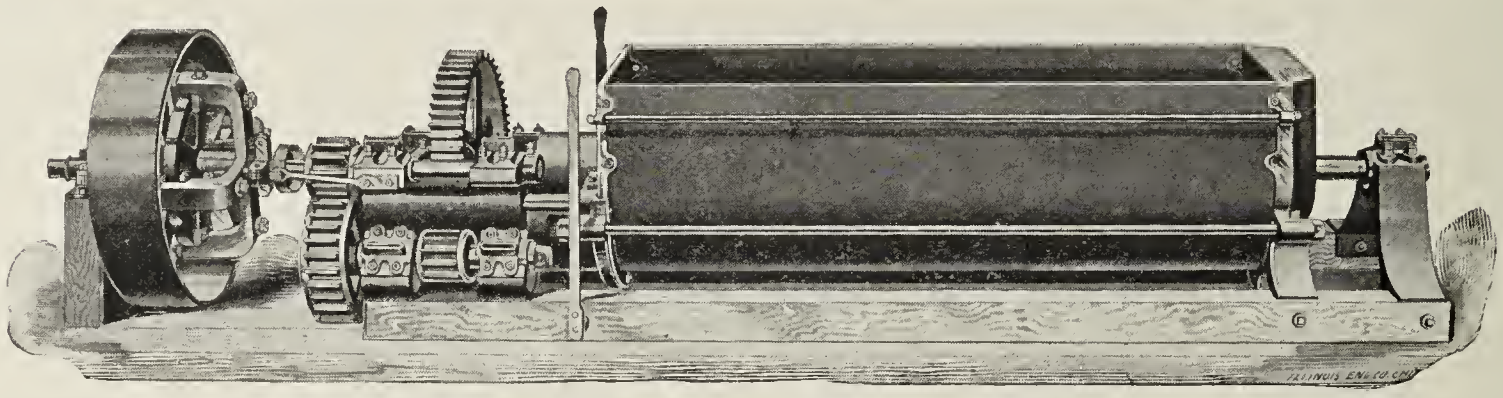

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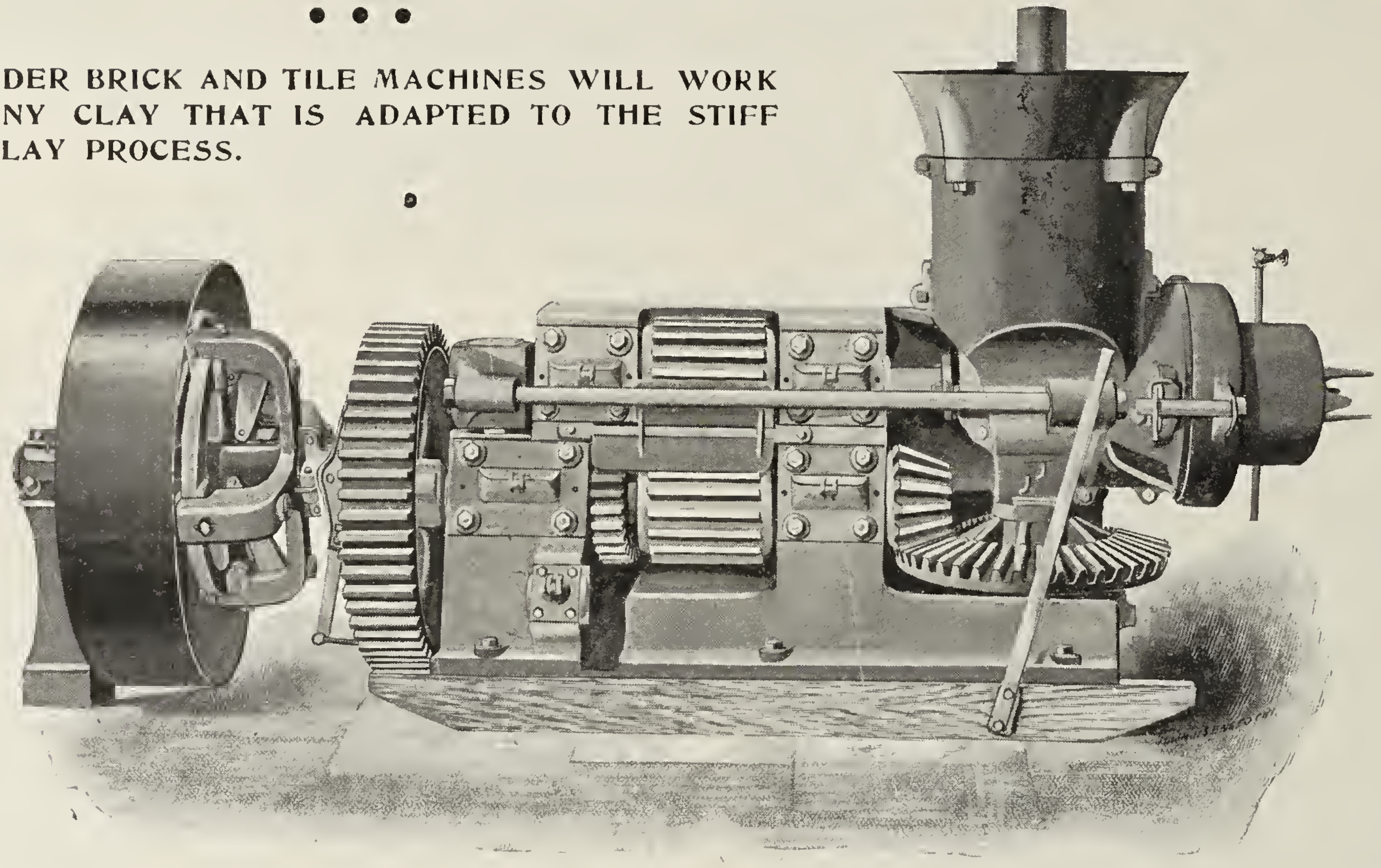

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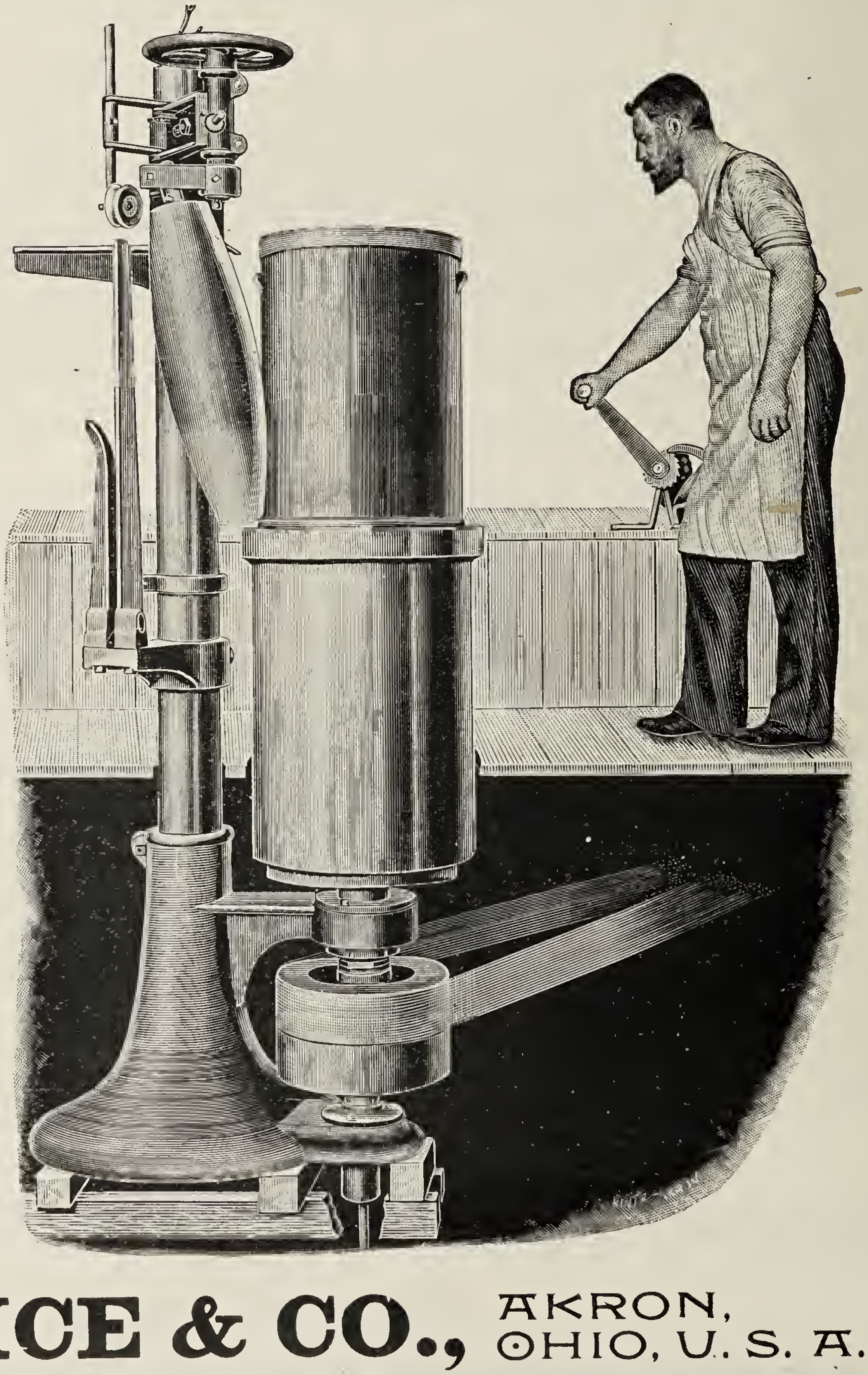

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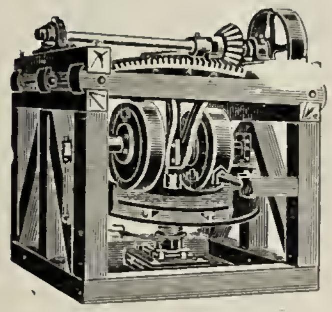

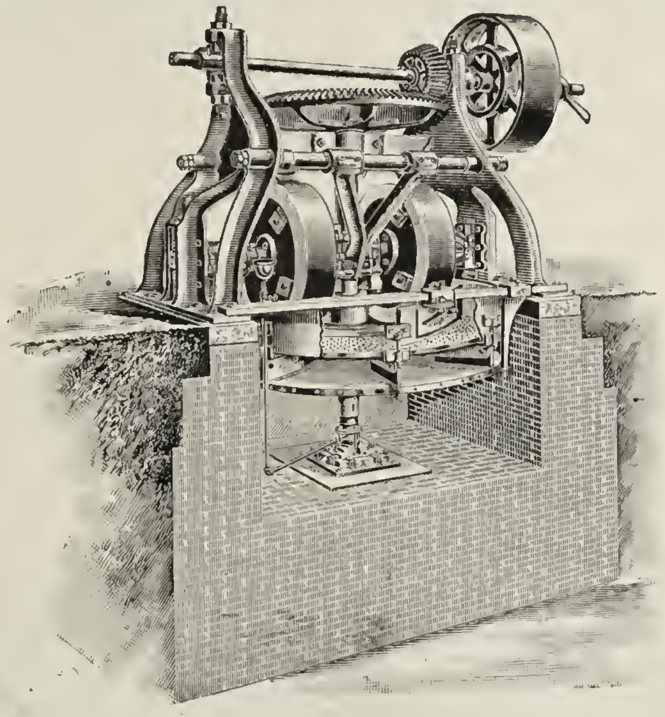

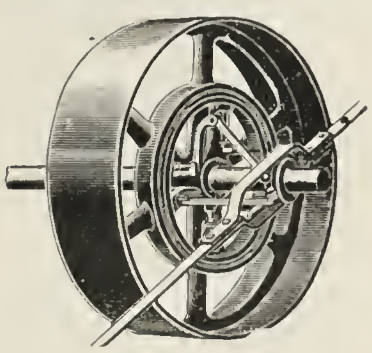

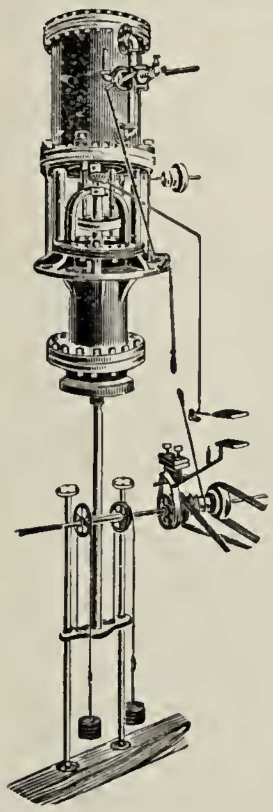

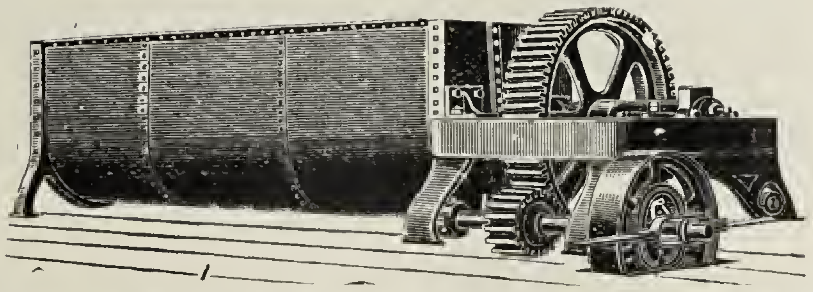

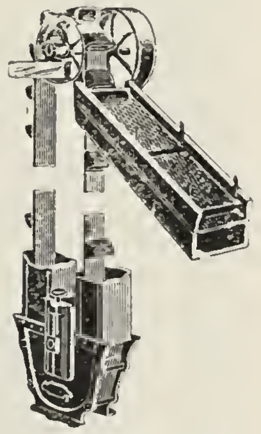

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The cars we purchased of you are the best and most practical we have seen. In fact the Drier with its outfit is to us an agreeable surprise, in the matter of durability, practical use and expense on account of repairs.

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The Standard Dry Kiln Co.,

186 South Meridian Street. ***INDIANAPOLIS, IND.***

THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol. XXXII. INDIANAPOLIS, IND., SEPTEMBER, 1899. No. 3

Written for The Clay-Worker.

OLD ROMAN BRICK WORK.

FROM TIME to time we have printed matter relating to various forms of ancient art, and many of us are inclined to attach a certain amount of respect to ancient work, not alone because of it being good, but simply because it is old. The terms ancient work and good work are by no means synonymous, however. We have more to learn from the spirit of a work and from the principles connected with its origin than from the work itself. In architectural and engineering journals which have to do with brickmaking and brick construction, there are many articles published relating to ancient brickwork. It is fair to say, however, that ancient brick are not to be compared with the brick of to-day. While much good work and great work has been accomplished in ancient times, using brick as a medium, it is well to bear in mind that the brickwork we are doing to-day is constructively

AN OLD ROMAN RUIN.

and from the standpoint of the engineer, far superior to that which was done during the old Roman period. Roman brickwork is entitled to more credit from its artistic excellence, from the effect as developed to the eye rather than to the inherent character of the brick themselves.

We are disposed to believe at times that we can benefit ourselves through the experience of the past. It is more easy to achieve benefits through studying the principles of this construction than by copying what they actually do. As a matter of fact we will achieve very little by experience. Experience counts for very little or nothing unless it is grounded on good principles. Mere experience, or mere doing for any great length of time, may, and usually does, mean very little. Those of us who start to do anything may continue for years or we may sift the centuries of experience of others and gain little benefit, if we regard the mere doing and not the underground principles which underlie the actual work.

The best thing about Roman brickwork is not the brick themselves, but the engineering principles which it involves to construct forms and the engineering principles and methods of putting the brick together. It may be said that Roman mortar or cement is much better than Roman brick, and, by the way, "Roman brick," as we make them to-day—that is, the long, thin brick—are infinitely superior constructively (from a brickmaker's standpoint) to any of the other ancient brick. Most Roman brickwork would be more easily understood and better appreciated were we to recognize the brick merely as a part of a concrete composition rather than as a face brick as we know them to-day.

This old work was not done by a high grade of workmen nor by skilled bricklayers, but by a very low grade of workmen, poorly paid, under the direction of a superior engineering force. Roman construction and architecture were what we might call academic. There were certain clearly defined principles and certain methods which were carried out mechanically under the direction of a very few educated men, but, after all, with very little originality.

The Roman government formulated its building methods in the same way as it formulated government. For instance, in colonial government, where it was ordinarily very successful, conditions of climate, local surroundings, the condition of the people and general circumstances had very little to do with the actual carrying out of either governmental principles as related to these conditions, or constructive building principles, which would naturally be influenced by local surroundings. For instance, the building work done for the Roman government, or under its domination in Greece, was the same as that done at home. The Roman domination in Constantinople, as an example, led them to do the same class of building there as they did in Rome, notwithstanding the fact that the requirements of climate and the different habits of living would suggest other forms of construction, plans and arrangement of buildings. The Roman government was as dominant, as forceful and as unrelenting in prescribing methods of building to the people it conquered as it was in prescribing methods of government and construction at home. It did not require a great original architect to do this work after it had reached a certain period of development. Everything was done by rule —by formula—and it did not require original thought or original planning. This was as true of constructive as it was of governmental principles. It was true of its decoration or ornament.

Those of us who have studied Roman architecture in its early stages know that its original inception grew out of what the Greeks had accomplished. They originally used Greek decorative detail, but went further than any other nation had gone previously in the use of the arch. The Greeks had confined themselves to the use of the lintel. The Romans, however, used the lintel and the arch. Their original forms of decoration were taken from that which was suited to the lintel and the supporting columns which were used by the Greeks, but soon took to itself a monotonous detail, which was never a part of Greek architecture. As they developed this system they ceased all originality, and, whether a building was to be constructed at home or in a Roman colony, there was no difficulty in telling exactly what would be done. They had a distinct formula and method for all construction. It might be a government building for administrative purposes, a large circus, baths, a decorated retaining wall, the principles and method of construction were always the same. Local material even played little part in carrying out their plans.

The essential difference between the old Roman architecture and the architecture of America is in the latter's spirit of originality, not alone in plan and general arrangement, but in every decorative detail. Our temples—our churches, as we call them—are of a distinctively different type from our commercial buildings. The decorations are by no means the same. The spirit of independence did not obtain in a developed Roman work. There was no originality expressed by the architect or by the people represented. In our time architecture is as heterogeneous, independent and free as individuals who make up our government and country. Roman architecture was almost slavish in its character. Independence was unknown. It was the architecture of the Roman government and not of the Roman people which composed it. It is an expression of Roman history.

American architecture is the expression of the American people, not as a class, but as individuals. We build a theater or a dwelling or a commercial structure, and we build it as we please.

In Rome the theaters, the Coliseum, the baths, the temples were built practically according to the formula which dominated all things Roman. For that reason, when we look at a photograph or a cut of Roman structure, we readily know it is Roman. Not so with the general type of modern structures. It may express the character of the architect, the wishes of an individual owner or the civic spirit of an independent municipality. We have no character in our architecture which at once emphasizes it as belonging to a State or to the country at large. We are a free people, and we express it in our architecture the same as we do in our living.

L. H. GIBSON.

BRICKS VS. SANDSTONE IN A FIRE.

AMONG THE LARGE NUMBER of buildings that were swept out of existence in the recent fire at Victor, Col., was the depot of the Midland railroad. This was a small but handsome little depot whose walls were built of stock brick, with red sandstone caps and sills, while the rest of the structure was wood. Under the fierce wind that made this fire so resistless as to wipe out the entire business section of the town this depot was completely gutted, and nothing but the four walls are left. An examination of the walls showed that the brick were not injured in the slightest, beyond some smoke staining, and the walls could have been used again. But the sandstone sills, caps and lintels were completely ruined and destroyed by cracking, spalling and splitting. Yet it is not so long ago when sandstone was regarded by furnace men as far more durable and reliable than brick for lining furnaces, and especially the crucible, the most important place. Yet, under the sudden, fierce heat of this conflagration the sandstone failed completely, while the brick resisted the fire most successfully.

The wise architect who would successfully resist the ravages of fire as well as time should, therefore, exclusively adhere to clay products. "ALUMINA."

Woman can't throw a stone, but when she drops a flower pot out of a window she always hits somebody.—Emma Carleton.

Written for the CLAY-WORKER.

BUTTON-HOLE TALKS.

MOST in thought I was standing on the street! I get lost in all sorts of ways, but rarely lost in thought. That's why I mention it particularly. Generally it's a regular, old-fashioned, common, everyday lost, and very frequently it's on the street, but it generally comes from my feet and not from my "think." I want to be candid and fair, and so repeat that the infrequency of this particular pattern of "lost" is why I mention it.

There is one particular feature of these events with me, though, that, whenever I get lost, I get found. It is true I may only be found to get lost again, and possibly lost quick, but it will only be to be found again. Sometimes it is the man with the little shells, or the gold brick, or it may be the volunteer guide to the "place where the tunnel caved in," but the finding always follows the losing as the day the night. This getting lost has come to be with me so frequent that some of my friends have even suggested my retaining a permanent guide, so as to avoid diversity in my findings. They urge that one man could become familiar with my methods, and do the finding more gently and cheaper than the volunteer individual talent that I now acquire. They did not call him guide, I think, but used the term custodian. This, however, is not a biography, and I will switch off from my individual history and come to what I want to tell, which has to do with the man who found me this time that I was lost.

I was lost in thought, as I have said, when I was suddenly aroused by a great, heavy, muscular hand, which smote vigorously and flatly between my shoulder blades, and, clinching up, gathered in the slack of the back of my coat to such an extent that it almost pulled the buttonhole, for which his other hand was reaching over my shoulder.

"Now, Gates, honest now, isn't that your boy's coat you have on? Never mind explaining how they got mixed and all that. I knew it was his, because it is a better coat than you generally wear. The wearing of it, though, marks an epoch in your life and in his. Funny how all these things run in periods. Boy and man they run through and space off all our lives. Remember how you used to warm milk for that boy cold nights? How you used to get all tangled up in his long, baby dresses? Then, later on, another period, a proud period indeed, when you bought him cute little knickerbockers, and he was 'a boy in pants?' Then came another period, when he ran to arms and legs, and acquired long pants. Long pants they may be, indeed, but never too long, they are never long enough. The legs grow so that they are always sticking way through them, and the big feet projecting out from the bottom extremities of the pants, and the big hands protruding from the always short coat sleeves, are always in the way of everybody. The boy knows he is a misfit and in everybody's way, everywhere and at all times, knows his hands and feet are away ahead of the rest of his anatomy and generally too conspicuous.

"Then there comes the stage at which your boy has now arrived, when the muscle has begun to fill out and cover the bones, when the hair on his lip has become absolutely perceptible, and he no longer has to shave in absolute and haunted seclusion, but can go right into the barber shop and order it as one entitled to what he orders.

"He comes out of those awkward days where his gawkishness was accented by wearing your made-over clothes. Garments which his comrades recognized instantly, and to whose history they frequently and persistently called his attention. Trousers, perchance, which the cunning and economic hand of a mother had 'turned,' which circumstance his chums realized and frequently made the basis of their inquiry as to which way he was going, backwards or forwards, they well knowing that after a judicious use of this weapon he would not have spirit to resent any insult, or spunk enough to refuse any dare.

"But your appearance shows your boy has come out of all this, and graduated from it, and is now 'a bigger man than dad.' You are wearing his old clothes, and not only that, but they are too big for you. It is the beginning of the wane period for you. From now on the boy will surpass you. Your path will go down, and his will go up. He has the fire of youth, and energy, and strength, while your joints will get stiffer and stiffer; you will feel more and more tired and the little lot in the cemetery, where your fathers sleep, will not appear so dread nor so far off. As you scatter flowers on their graves you will think more and more of them as resting, as sleeping, and will realize the rapid approach of the day when you shall close the volume of your life and sleep with them, and when your boy will bring the flowers, and they will be for you.

"But the joy of it all is that he is your boy. If he is bigger than you it is all right, because he is your boy. If he is smarter than you you glory that it is so, for is he not your boy?

"The downward trend of your boy will be hidden, and your pains soothed, by his success, and you will forget your own weakness in his strength. His old clothes are pretty good old clothes anyway, and you can swell out your chest and try to fill them, and even if you can't fill them it only proves that he is a big man, bigger than a big man, and he's your boy."

GATES.

OBITUARY.

W. J. Kountz, Jr., of the firm of Kountz Bros., brickmakers, Allegheny, Pa., died at his home in that city Aug. 18, of appendicitis, aged thirty-two. Mr. Kountz, though a young man, had achieved marked success in several business ventures. Personally, Mr. Kountz was a prince of good fellows, and those of our readers who have met him at the N. B. M. A. conventions will learn of his demise with real sorrow. Earlier in life he had been a commercial traveler, and in that way made thousands of friends throughout the country. As a bon vivant and story teller he had few equals and no superiors. But, underneath all the effervescence of his manner, there was the bed rock of solid character. Mr. Kountz was buried with Masonic rites, and his funeral was largely attended by his fellow-members of the Syria Temple of the Mystic Shrine.

The Late W. J. Kountz, Jr.

Written for The Clay-Worker.

A GREAT TILE FACTORY.

THERE HAPPENED to be three of us! Getting off at a little station called "Melcher," in honor of the founder of the Marion Brick Company, we found ourselves in close proximity to that works and near neighbor, the Summitville Tile Works. As we read a description of the former in a recent issue of The Clay-Worker, we will not go into details of the plant further than to mention the addition to its equipment of a new all iron Potts stock brick machine, which was installed early this spring to enable them to meet a demand for sand-faced stock brick, and it does it to perfection. The machine has a capacity of 40,000 a day, but is only run a few hours each day, as in that time it fills the drying tunnels set apart for stock brick, their principal output being side-cut stiff-clay brick. The tile works is the plant we want to talk about now. In age it is but an infant, being started (new) last January, but in size and development it is a credit to the family as a branch of the Summitville Tile Works system. The few photos we were able to take give but a faint indication of the real size of the works.

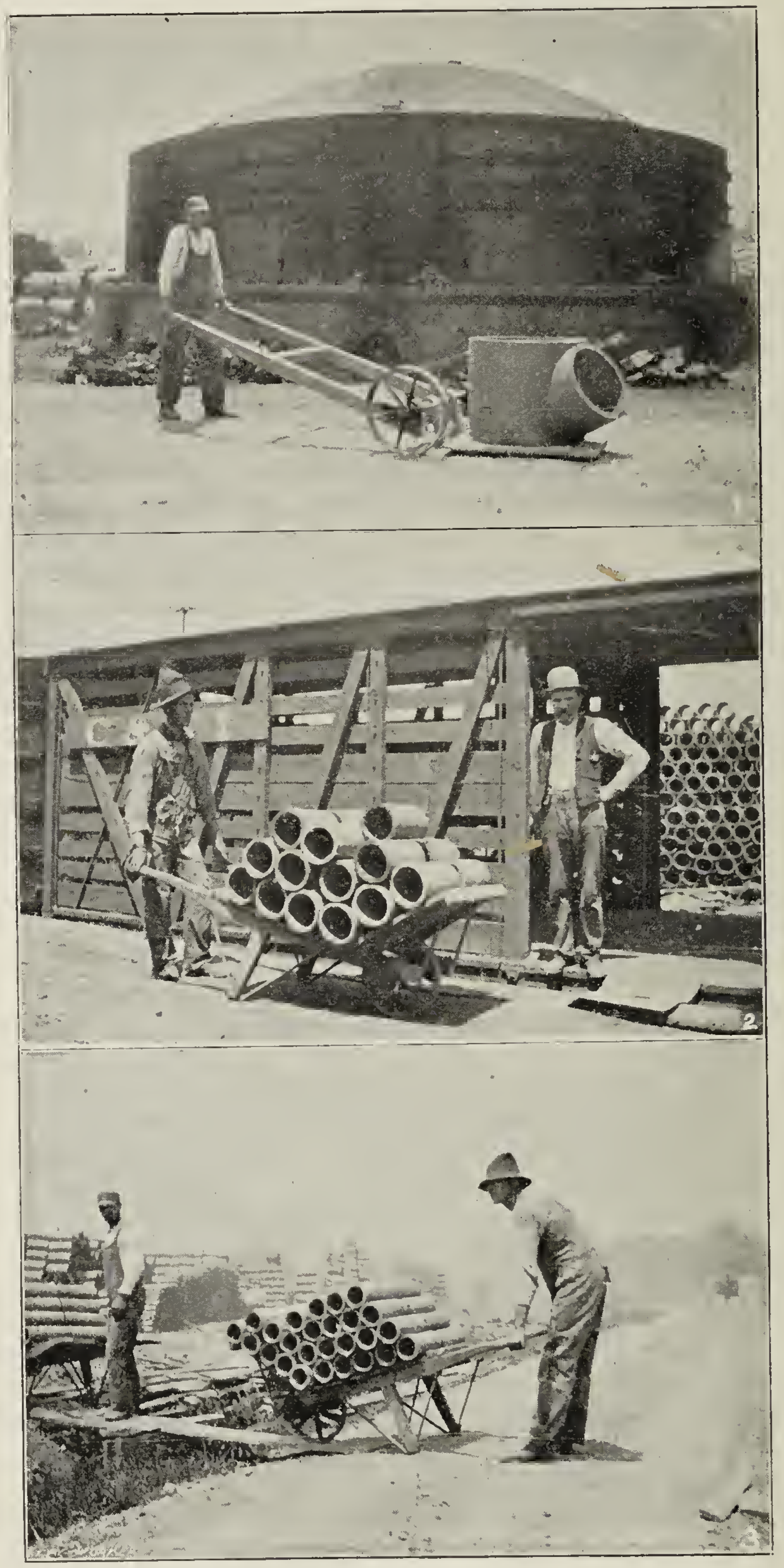
Introducing ourselves to Mr. Alex. Conner, the superintendent (who, by the way, was formerly superintendent of the United States Fire Clay Company, of Lisbon, O.), we were very cordially received and conducted through the entire works. The impression of solidity received by a glance at the outside of the building was something out of the common order—no tumble-down frame affair, but a substantial red brick structure, built to plans. Please note "plans," as in too many instances the buildings are thrown up haphazard and then twisted and pulled into the shape it should have been in the first place. This works is built on land leased from the Marion Brick Works, and is immediately adjoining. The latter company have a Marion steam shovel, with a capacity much in excess of their requirements, and the same of their grinding machinery, a condition which just suited the tile people, making it practicable for them to buy their raw material ready ground. The brick company possess an excellent and almost inexhaustible bed of red-burning shale, which they are working, and other land containing fire clay, potter's clay and several veins of coal of varying thicknesses.

The shale is hauled from the steam shovel in cars holding two yards, by a wire rope and inclined railway arrangement. It is then dumped in large storage hoppers, delivering to three nine-foot Frost pans. Two of these pans are in constant service, grinding material for 75,000 brick per day. The third grinds for the tile works. Passing from the pans up ordinary bucket elevator and down incline stationary screen, it falls into cars and is again elevated by wire rope and inclined railway to the top floor of the tile works and is again dumped into an immense storage bin. From this bin an ingenious system of elevators and conveyors transports it to any desired department of the works. The smaller sizes of tile are made on Nolan-Madden machinery, using the Fate automatic cut-off table, which combination, the superintendent assures us, was in every way satisfactory. Most of us have some particular pet, something we swear by, it may be but a favorite brand of wh— cigars or a horse or a kiln or, as in this case, an exceptionally good machine.

Conducting us up a flight of stairs we were halted in front of it. "Gentleman, that is the machine we make our big tile on, up to twenty-fours." "Is it a good machine?" was met by a reassuring smile and a very emphatic "None better." It certainly is a massive affair, and, judging by the quality and quantity of the tile turned off while we waited, the Taplin-Rice sewer-pipe press deserves the high commendation of the users.

The buildings are heated throughout both by live and exhaust steam in the daytime and live steam at night. There are three large double elevators, connecting every floor, over which the tiles are sent by the truck load to kilns. These are so nicely balanced that the full truck carries back the empty one, making the handling of tile both expeditious and economical, reducing the breakage to the minimum. The large tile are trucked to and from dryer and kiln on improved trucks, enabling one man to handle the largest tile easily.

Ample power is derived from an Atlas engine and boilers of seventy-five horse power, boiler also supplying steam for heating purposes.



A Good Way to Handle Large Tile—Loading Tile in Cars—Piling out on Yard.

The tile are burned in eight round down-draft kilns, each having a capacity of three carloads of tile.

We noticed an ingenious arrangement for setting large tile. This is in the form of a swivel crane and straps. It is erected in the center of the kiln, with a revolving arm fitted with block and rope lifts. As soon as the strap is buckled around the tile, presto! it is gone and as quickly and as gently set in its proper place in the kiln. This and many other labor-saving devices were to us prominent features, representing skillful thought and management.

During the last few months a small village has grown up around the two plants. All the houses are under the control of the brick works superintendent, but are about equally divided among the employes of the two works. And none but those in good standing need apply.

Passing from the tile to the brick works, we hunted up our old friend Carson, the superintendent, and caught him, as you see at the head of this article. After a general chat and a hearty, old-fashioned hand-shake, we followed the setting sun.

ROADSTER.

Written for the CLAY-WORKER.

ROCKY MOUNTAIN GOLD BRICKS.

Salmon Bricks Worth $150 Per Thousand.

COLORADO is famous for its bricks of the pure yellow metal that are worth as much as $25,000 per brick, and which are produced by its numerous gold mills and smelting works from her abundant gold ores. The "tenderfoot" also occasionally stumbles across a big, solid yellow brick that he buys for a song from some big, honest-looking miner, who wears a red shirt and high boots, which subsequently is found to assay 99 per cent. brass. But the writer came across some atrocious-looking, stiff-mud, salmon brick the other day, in a small brickyard, that were worth from $125 to $150 per 1,000. It was an ore buyer from a smelter that was paying these fancy prices of 15 cents per brick for the gold that they contained, and not a tenderfoot contractor, as the bricks were almost as weak and friable as "adobes," or sun-burned bricks. The brickyard was an appendage to the big mill at Colorado City, at the base of Pike's Peak, that treats over 200 tons of gold ore per diem from the rich Cripple Creek district by the chlorination process. In this process the gold ores are crushed very fine, or to less than 30-mesh (30 holes to the lineal inch), which are then roasted in large mechanical roasting furnaces. Considerable very fine dust is produced in the fine crushing and roasting, which is drawn off by exhaust fans and settled out in extensive large flues and huge settling chambers. What to do with this fine dust has always been a serious problem to the metallurgist (or the fellow who runs a metal kiln), as it is usually very rich in the precious metals. It is very difficult to reach, as it clogs the vats, while, if it is run through the usual types of smelting furnaces, it all blows away, from its extreme fineness. At this mill they have solved this problem by attaching a small Ohio brickyard to the plant and making up this dust into salmon brick. The dust is pugged and then run through a "Centennial" stiff-mud machine, which makes a side-cut brick. The brick are then dried on pallets over an old-fashioned tunnel-heated floor, and the dried bricks are then burned in a small clamp or up-draft kiln. While the brick would not pass the inspection of an architect for color, ring, strength or beauty, they are sufficiently strong to bear the rough treatment of the smelting process without loss as dust. There is so little clay in the ore that the mud has not much plasticity, and consequently the bricks are not beauties in shape, while only a light burn is given to them of sixty hours or so, which also acts as a desulphurizing process. But the brick now holds the gold in such shape that it can be recovered, so that the metallurgist is more than thankful for these crude bricks, as he can now recover the gold without loss.

A Great Tile Factory—At the Clay Bank.

The semi-dry process has been quite frequently called to the aid of the mining engineer to compact concentrates or other fine products into bricks or briquettes; but the bricks are, of course, very tender, and the results have not usually been satisfactory. But to make up the product by the simple stiff-mud process into crude bricks, and then burn these rapidly until they have strength enough to stand rough usage is a decided improvement, and suggests a new opening for the brick manufacturer of limited means.

"RAMBLER.

QUEER BRICKYARD STRIKE.

Employes Quit Because They Didn't Like the Food Served.

Brickmakers of the Butte (Mont.) Sewer Brick and Tile Company are reported to have struck recently. This strike is said to have been out of the ordinary, and it was not a question of wages, but of board, more commonly called grub. It is said that the men get $3 a day for working in the yard. The wages were perfectly satisfactory. What the men are said to have kicked about was their accommodations at the boarding house run by the company at its plant. This is said to have been run on the table d'hote principle; that is to say, the men had no right of selection, but what they were expected to eat was laid on the table before them. The boarders were more accustomed to the a la carte system of serving meals. A kick was made for a change, but the kick didn't land, and the result was that instead of doing the thing up in military style and signing a round robin, so that the instigators of the movement could not be picked out, a committee of three took the matter in its own hands, and, instead of getting what they demanded, were discharged. Recognizing that the three had sacrificed themselves for their brother employes, the brother employes quit of their own volition, and that is the way matters stand.

A Great Tile Factory—The Tramway Leading to Factory.

Be sure that your own business is properly attended to before you mix up with your neighbor's affairs.—Exchange.

Written for the CLAY-WORKER.

WHAT KILN SHALL I BUILD? No. 7.

IN OUR LAST PAPER we treated of kiln furnaces, confining ourselves to those of the open or pitch-grate type, such as are usually found in down-draft crown kilns, and we suggested an inexpensive method of converting these into closed furnaces susceptible of being regulated to meet atmospheric conditions and also the varying requirements attending the different stages of a burn. We suggested that there were no hard and fast rules to be given, but that a wise man would make a study of his conditions and then adjust his kilns and furnaces to meet the requirements of his fuel and clays.

To illustrate what we mean by such "adjustment to conditions," a party is using a coal which readily clinkers, giving him great trouble in keeping his fires clear or his bars clean; he discards bars altogether and secures better results with much less of labor, while his unthinking neighbor goes on in the way of his fathers.

The man who stands behind a clayworking industry and is responsible for the conduct of the business, whether as owner or superintendent, cannot afford to remain ignorant of the general laws involved in combustion. He need not necessarily qualify as a burner, but he should be able to discern the errors and mistakes and also any shortcomings of the man or men who may be intrusted with this important, and we may say most important, detail of the clayworking business, and know how to remedy evils also.

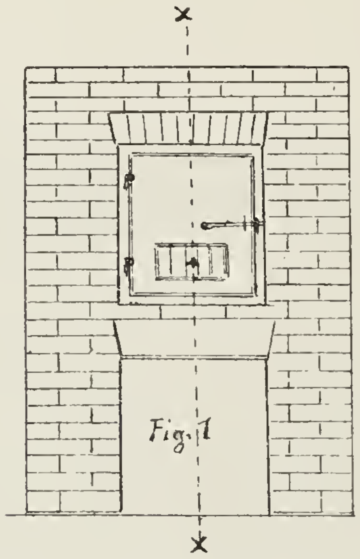


Fig. 1

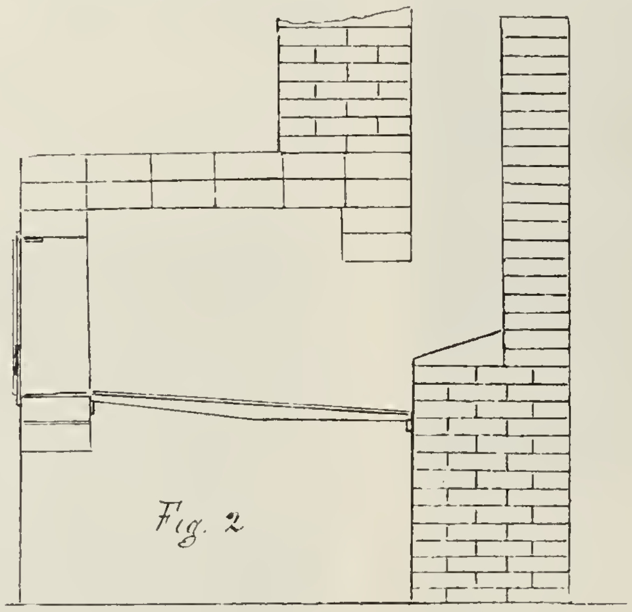


Fig. 2

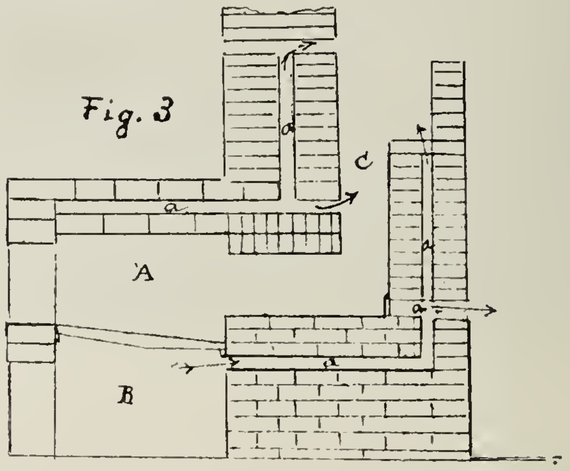


Fig. 3

It is comparatively easy to "get the hang" of the simple machinery required in a clayworking establishment after it has been once successfully operated and while the character of the clay remains the same. Any trouble that occurs is easily traced to its source, and the remedy is usually plain, if we may except the forming dies of an auger machine or a plunger machine, which often require very close study and the careful fitting of each new die to insure the best results. The right use—that is,

—The Best Use of Fuel,—

Furnishes an altogether different problem, since one never knows when he has reached the highest attainable results. A German proverb has it, "The good is the greatest enemy of the best," and too many are ready to adopt the old saw, "Let well enough alone," which we are disposed to characterize as a lazy man's excuse for not using his brains.

The problem of burning clay in a manner to secure the best results with the least expense, is a complicated one, and calls for broad experience, or, in lieu of it, what we have already termed a knowledge of the laws involved in the process of combustion, to which should be added the knowledge of how to use the heat produced by combustion to the best advantage in burning clay wares. We adduce a single phase of the combustion question as an illustration. Scientists tell us just how many cubic feet of air are requisite for the consumption of a pound of coal. In theory 150 cubic feet are required to furnish the necessary oxygen, which alone is available or useful in combustion, but careful experiments carried on by the United States government have demonstrated that in practice about double the amount is used, or 300 cubic feet per pound of coal. This experimenting had reference to the use of coal in generating steam, but no doubt the conditions are much the same in kiln use.

—Why This Means Fuel Waste.—

To insure complete combustion there must be two parts of oxygen to one of carbon, and these must be united. Anything less than this supply of oxygen means the carrying through the kiln unburned a volume of carbonic oxide, which is formed of one part each of oxygen and carbon, and which represents a waste of about two-thirds the fuel value of the carbon consumed in its generation.

We say of a pound of coal it has such a heat value, designated by so many heat units. When we convert it into carbonic oxide it carries into the open air two-thirds of this value unused or wasted. On the other hand, we supply more air than is necessary for combustion, and every needless cubic foot that passes through our furnaces represents a waste of heat. What will this amount to in burning a kiln of clay wares, assuming that 300 cubic feet of air has been used in consuming each pound of coal, instead of 150 feet, proven to be sufficient for the oxygen supply?

Take, for instance and to illustrate, a kiln holding 40,000 common-sized paving bricks, weighing 7½ pounds each and requiring for their burning 30 net tons of coal, which is considered good practice, and we find we have, while burning this kiln, passed through it 9,150,000 cubic feet or air above the amount theoretically required, converting its temperature from that of the outside atmosphere, whether at zero or otherwise, to a temperature of from 2,000 to 2,500 degrees, without a particle of compensation therefor. In other words we have practically diluted our heat to such an extent as to require double the amount of fuel that science tells us would have been sufficient, could the oxygen of the air introduced all have been made to combine with carbon in proper proportions under proper conditions.

—Why This Is Not Done.—

First—The gases of the coal introduced into our furnaces are often liberated at a point where the heat is insufficient to consume them. This is certain to occur after a heavy firing and to continue until the heat is again raised to the requisite degree of temperature.

Second—The air is admitted in such volume that the oxygen it contains cannot combine with the carbon, because not brought into immediate contact with it, but, as a stream of water entering a river remains a separate body for quite a distance, its edges first commingling and only gradually the whole body, so any considerable body of air admitted to a furnace, especially if above the grate, is liable—a portion of it—to pass the point at which the heat was sufficient for ignition before the union between the oxygen and carbon can take place, and hence passes out of the kiln unused, but, like a thief, steals and unites with an equal body of carbon in its passage, carrying it away also unused.

These facts of fuel waste leads us naturally to the consideration of how we may construct our kiln furnaces in order to reduce such enormous waste to the lowest possible limit. We must first come to an understanding of the need, else we shall make no effort. No doubt the loss from the one source mentioned is greatly in excess of that named by our government experts, which takes in view that which may be called good practice in making its estimates.

There are other equally important points to be taken into consideration in the construction of our furnaces.

First—Such form and location as shall insure that all the heat generated enters the kiln.

Second—A proper area of grate surface for the service required.

Third—The proper form and area of the combustion chamber.

Fourth—Conveniences for handling the fuel and ashes.

The consideration of these matters will not take us beyond the bag walls of the kiln.

—The Second Form or Type of Furnace—

To be mentioned is that of the horizontal grate bar type, with hinged doors for both the box and ash pit, much after the form of the furnaces of a steam boiler, save as an arch covers it without a boiler intervening. What is claimed for such furnaces is that they may be more perfectly regulated against weather changes than furnaces uninclosed; that the loss from the escape of unconsumed gases outwardly from the firing holes is prevented; that there is less loss of heat from outward radiation, and that the amount of air required for combustion may be more easily regulated, and that these several benefits accrue especially during the early stages of the burn, or the period of "water smoking," when the largest wastes are likely to occcur. In Fig. 1 we give a front elevation of such a furnace, and in Fig. 2 a vertical longitudinal section on the line X—X of Fig. 1.

Fig. 4

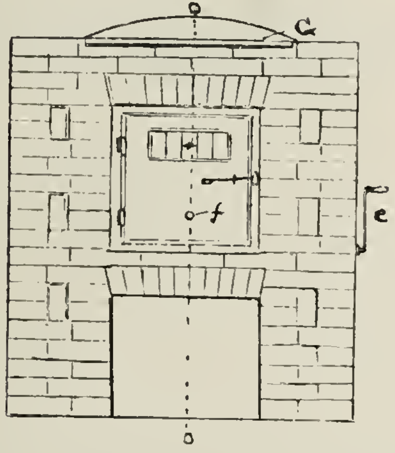


Fig. 5

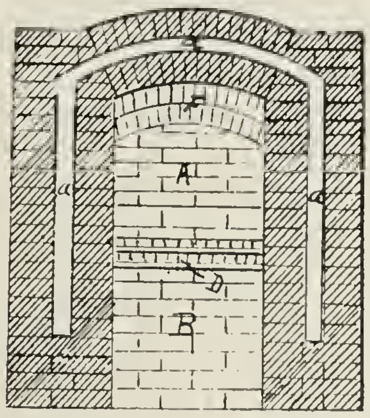
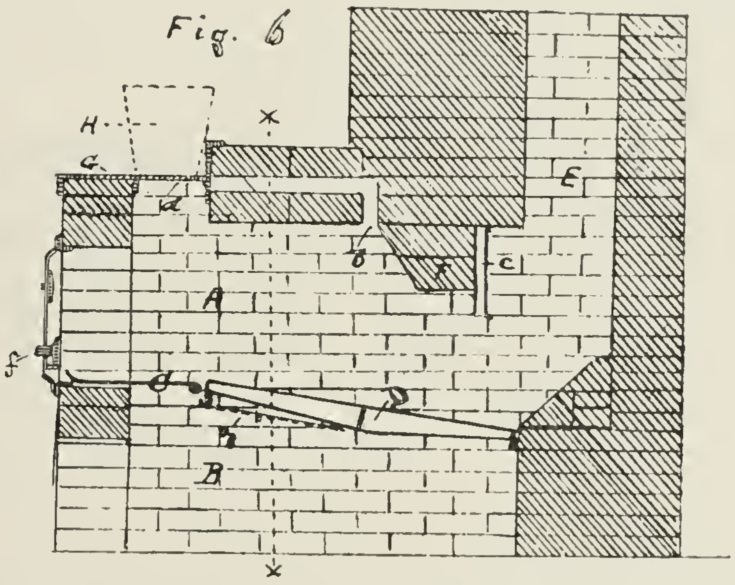


Fig. 6



There are various modifications of this class of furnace in the interests of economy and closer regulation, one of which we now illustrate, being a partial view of the plans of a well-known kiln builder. The portion shown, being only of the furnace in its connection with the kiln, is of interest as showing his method of securing more perfect combustion and preventing loss by the radiation of heat from the walls of the furnace.

In Fig. 3 is shown a longitudinal section of such a furnace. A the fire pot, B the ash pit, C the bag flue, while the passages a a, etc., are for the conveyance of heated air to points where most needed for securing perfect combustion. The walls of the furnace are chambered, as is the arch of the furnace, the chambers of the one connecting with the other. Air is taken into the side walls through openings in the front of the furnace, and flowing inwardly it absorbs the heat that would otherwise pass through the wall and be lost, carrying it in and distributing it by air passages at various points, some of which are shown. The principles of construction to secure the ends named are good, and seem to be well applied.

One other modification of this class of furnace is attaining to some popularity at the present time, and the indorsements of users would indicate that a good degree of success is being realized. We refer to the attempt to bring the coal, when first introduced into the furnace, into the presence of a heat sufficient to convert the volatile portion of the coal into gases and at a point where they shall need to pass over or be brought into contact with heat of high temperature enough to consume them, instead of passing into the kiln unconsumed.

—It Is Well Known—

That when fresh fuel is thrown upon a fire a large volume of gas is at once released and that there is a strong probability that much of this gas will pass through kiln and stack unconsumed, because the introduction of a cool body, covering the incandescent fuel, reduces the heat to such extent that the escaping gases will not ignite, and hence will be lost.

Now, in coking the freshly fired coal, and in passing the gases over the live coal, the gases will be consumed and the full fuel value secured, provided, of course, the oxygen is at hand in proper form and quantity.

This is the theory on which the expectation of saving may be properly based, although the several parties who in the columns of The Clay-Worker and other journals are presenting their methods to the consideration of the public base their claims of saving mainly upon the facts, first, that a ton of screenings can be made to do as effective work as a ton of lump coal, and, second, that the fuel may be introduced without the admission of an unnecesary volume of fresh air, so saving cooling of kiln and checking of wares.

Now, while these are both good points, we are mainly interested in showing the reason why economies should and will result, from an intelligent handling of fuel, and why fuel as ordinarily burned does not and cannot render its full value, so that whatever furnace one may employ he may endeavor to bring his knowledge of underlying principles into service. The recognition and understanding of these principles will form the first step in the line of progress.

We give another series of illustrations of a furnace which is designed to combine the benefits of both the improved furnaces referred to. In these illustrations Fig. 4 presents a front view, and Fig. 5 presents a cross section through x—x of Fig. 6, and Fig. 6 a vertical longitudinal section through o—o of Fig. 4.

The special features of this furnace may be understood from the following description: In Fig. 4 a series of openings 2x5 inches may be seen on each side of the doors. These furnish an air supply for the chambers a a a, etc., seen in Fig. 5. The air chambers in the side walls connect with the one in the arch, and the portion of the air that passes through this arch chamber is discharged into the fire box at b through a slot at the end of the arch extending its entire width, thus presenting a sheet of hot air the full width of the furnace at a point where it will intercept and mingle with the gases passing that point, which are deflected by the hanging arch F, bringing them into near contact with the glowing fire on the grate and so insuring their combustion. Another portion of the heated air from the side wall furnace chambers is discharged through slotted openings in each side wall of the furnace, one of which is shown at c in Fig. 6. It will be seen that this air also is delivered in a manner to quickly commingle with any gases escaping unconsumed for lack of oxygen, and at a point of highest heat.

In Fig. 6 A indicates the fire box, B the ash pit, c a hinged coking plate, D the grates, E the bag flue, F the hanging arch, G an iron plate covering the fire box and overlying the lower course of arch brick, and through which communication is had with the fire box by an opening in the plate at d. The method of feeding the furnace is as follows: The dotted lines above plate G, Fig. 6, indicate a removable coal hopper, which answers as a scuttle also, and which is designated H. The plate G is more clearly shown in Fig. 7, in which an opening appears, designated by d. Figs. 6 and 7: This opening is closed by a slide designated by the dotted lines seen in Fig. 7 when withdrawn. The scuttle or hopper H has also a slide bottom. Being filled it is placed at point shown by dotted lines in Fig. 6. The slide d in plate G is then withdrawn, and also the slide in the bottom of hopper H, which discharges the coal upon the coking plate C. The slide to plate G is immediately closed and the hopper H removed and filled for the next furnace. Preceding any replenishing of the fuel the coking plate is cleaned as follows: A quarter turn of the crank e, seen in Fig. 4, will deposit the coal that is on the plate upon the grates. To spread this coal over the whole surface of the grates a handle is attached to the socket of the scraper f, seen in Fig. 6 as located in the door of the fire box. An opening through the door, seen at f, Fig. 4, permits the handle of the scraper to push it inward, spreading the fuel which has been dumped from the coking plate evenly over the grates, the scraper being of a length to cover the width of the furnace. The fire may be observed through the register in the fire door. It will rarely be found necessary to open the door, which will be used only in an emergency, and hence in the operation of firing there will be no volume of air admitted to work mischief and waste heat.

There is one other feature of this furnace which is an innovation upon any previous methods known to us, and that is provision for some other than a dead smudging fire during the period of water smoking, which, in burning pavers, requires about three days' of time out of about eight days usually allowed. We believe it

—Within the Range of Possibilities—

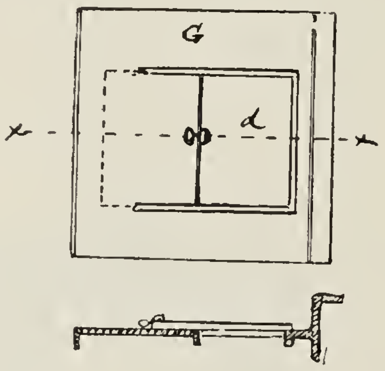
To use a fair average grade of bituminous coal and accomplish this portion of the burn with as bright fires as at any period of it, and at a great saving of fuel, and, what is as important to those burning wares requiring a fine face, without danger of their discoloration.

As water smoking is usually done where coal is employed, a sluggish fire, accompanied by the admission of a great body of air to dilute the heat generated, rendered sluggish both by the absence of draft arising from cold walls, cold wares, cold flues and frequently a cold stack, and further by the admission of large volumes of air above the grates, forms the rule rather than the exception, driving many to the use of wood, coke or oil during this stage of the burn.

The trouble lies largely in the fact that the same conditions as to grate surface prevail as are found necessary when the maximum heat in burning off a kiln is required, and in the open furnace the trouble is further aggravated by the inability to reduce the air supply. The remedy lies in starting with a warm stack (which may be secured by the methods named in a former paper), and the reduction of grate surface and air supply to a point just sufficient to meet the heat requirements of this period. Who would attempt to heat one room of a twelve-room house for any lengthened period with a furnace adequate to heat the whole house, and what would naturally be the condition of the fire? Yet we are taking, by present methods, just as foolish a course during the period of expelling water from our clay wares, which occupies one-third the period of the burn.

In the furnace under discussion a plate shown by the dotted line and located under the grate bars at g is slid into position on supports arranged to receive it, thus cutting off the draft from that portion of the grate surface lying above it and extending pactically the coking plate area. On the open section of the grate a small, bright fire may be maintained and the air supply be readily regulated to it. The plate may be withdrawn gradually as the fire needs to be increased.

Fig. 7.



—It Will Be Seen at Once—

That the application of this principle to both the open and closed form of furnaces is easy, the grate bars being in part covered with a plate and in the case of the open fire box a cover being adjusted to the fire opening.

We hear the objection raised that such a fire will mean injury to the wares through too rapid air circulation and too great intensity of heat. This does not necessarily follow. We are filling our reservoir—the kiln—with a lighter air, and as it ascends it gradually expels or takes the place of the colder air that retires before it, and only so far and so fast as the colder air is removed, and this removal can be gauged to meet the requirements. The comparatively small quantity of heated air thrown into the kiln may be diluted with cold air as circumstances may require, but not to the point of deadening the fire. The smaller volume of air thrown in will have time to cool against the walls and crown of the kiln before the wares are reached.

The air will be much more largely taken in through the grate than is usual at such time, and this will mean more perfect combustion. There will need be the exercise of good judgment to obtain the best results. We have tried to make clear the theory which we feel quite sure will be accepted by thinking men as correct.

Let the reader make the trial and report results to the publisher of The Clay-Worker. FLAME.

A CITY BRICKYARD.

The city of Glasgow, Scotland, has made greater advance in its municipal ownership tendencies than any known city of ancient or modern times, and its people seem anxious to push the experiments further. Glasgow has long owned its street railways, and they are operated at a considerable profit to the city.

The latest advance is a municipal brickyard. The city is erecting a new gas works on a large and extensive plan. The dirt used for the excavations is suitable for the manufacture of bricks of a superior quality, and as a matter of economy the city has established a brickmaking plant. It is ostensibly a temporary industry, to be abandoned as soon as the dirt supply from the new gas works is exhausted, but there is a general belief that if the experiment proves satisfactory and profitable the brickyard may be made a permanent institution and the city will undertake to supply bricks used in building at a cheaper rate than private manufacturers can afford.

Written for the CLAY-WORKER.

A BRICK FACTORY IN A WOODEN TOWN. No. 16.

L. C. M.

IN OUR LAST ARTICLE we described our up-draft kiln excepting the furnaces. I have no idea upon the subject of furnaces that I think could be called original.

I know there are good furnaces and poor ones, and perhaps none are perfect. I have never seen a smokeless furnace, nor one that would evolve as much heat from poor fuel as from good. I have seen some of the so-called coking table furnaces, and while I cannot give an unqualified indorsement to them I think they are some improvement over the carelessly constructed furnaces one generally sees attached to a brick kiln—especially an up-draft kiln. Most of the up-draft kilns are no kilns at all. but simply a heap of rubbish daubed over with mud, and permitting heat to escape from a thousand crevices. Of course such a tumble-down structure is not worth the expense of a good furnace. But when the brickmaker decides to go in for permanent improvement he looks about him for something better than the old way, and generally selects some style of kiln that has gained a reputation in his community, or perhaps an advertisement in The Clay-Worker catches his eye, and Eudaly, Pike, Flood or some other deserving inventor gets a reward for using printers' ink. Of course no cobbler can build such a kiln as one of these men plans, and a good mason is called in to do the work. The kiln walls are built just right, the crown is made according to the right order, and then furnaces are added that were not even dreamed of under the old regime.

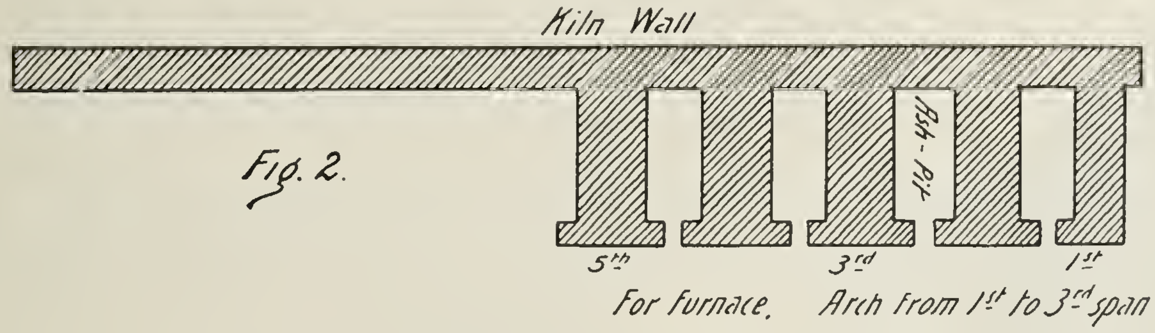


Fig. 2.

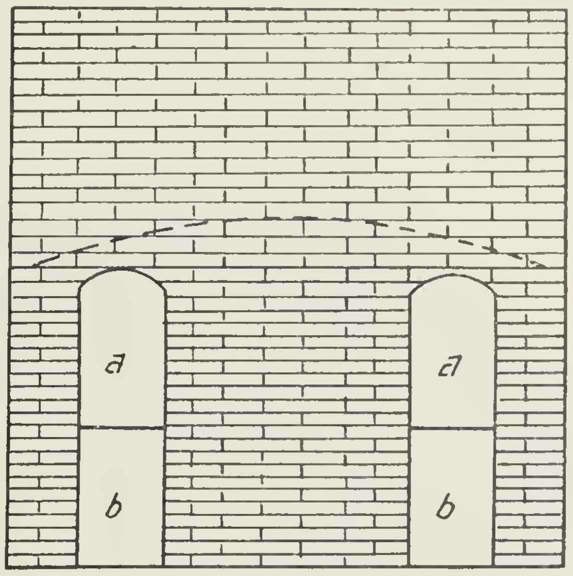
Then, when the fires are started and the burning proceeds, no wonder the old brickmaker is surprised at the results, and sends the patentee a strong letter of recommendation. I do not mean to deny that there may be great merit in some of the ideas of these kiln inventors. But what I wish to convey is that much of the credit these inventors get is due to the good workmanship they put in their kiln walls, crowns and furnaces.

One seldom sees a down-draft kiln that has not good furnaces attached, while with up-draft kilns the reverse holds true. No wonder, then, the down-draft has forged ahead in its reputation for good results. Let us build a few up-draft kilns as carefully as the down-draft are built, and put equally as good furnaces to them, and, though we may not equal the down-draft in every particular, we will be surprised at the percentage of good ware we will produce.

There are two styles of furnaces that may be used upon the up-draft kiln. The first needs no particular description—for it is simply a fire box four feet long and as wide as can be built one to each arch of the kiln. These furnaces are built together upon each side of the kiln, with only a 12-inch partition separating them. I would recommend grate bars with an ash pit below for all styles of furnaces when the fuel is wood, coal or slack. The second style of furnace I shall take the pains to describe minutely, sending a rough sketch of the front showing the doors and the ash pit doors below.

This style of furnace is built one furnace to accommodate two arches. Taking the measurements given in our last article on constructing the kiln walls, the fire holes were made 12 inches above the floor level. This will not be sufficient height if the floor level corresponds with the ground level outside. One would have to ditch or excavate at the sides of the kiln for the ash pits. The floor or bottom of the ash pits should be at least 18 inches below the floor level of the kiln.

Commencing, then, 18 inches below the floor level, build the walls to separate the ash pits as follows: Commencing at one corner of the kiln, space the ground so that 18-inch separating walls may be built between all of the fire holes. The walls should extend out from the kiln walls four feet and eight inches, so as to make a furnace full four feet inside measure. These walls should be built 10 inches high, and at the outer end should be in the shape of the letter T as shown in Fig. 2 of drawings given, so as to make the ash pit doors 12 inches wide. After these walls are built 10 inches high, the grate bar rests should be put in. Then the first, third and fifth walls and so on should be built 12 inches higher and still kept in the shape of a letter T as below, only the furnace doors should be 14 inches wide. Then build skew backs on each side of these walls and turn arches from first to third, from third to fifth and so on. Then build in the front of the furnaces, leaving furnace doors as stated above 14 inches wide and 14 inches high.



aa Furnace Doors. bb Ashpit Doors.

The arches over the furnaces would be better if made of fire bricks, but we have used some for six years that were arched with common bricks. These arches should also be strengthened with a second course, but of course common bricks would be good enough for this. Then the outside walls of the furnaces should be built up and braced in some substantial manner and the top filled in to turn the water and to prevent the waste of heat. And now you have a furnace with two spaces of grate bars, separated by an 18-inch wall of brick that comes up level with the surface of the grates and forms part of the floor of the furnace.

This solid floor between the two grated spaces forms as good a coking table as any I have ever examined that are patented. And in fact is almost identical with some of them. But this style of furnace is too old to be monopolized by letters patent, and we send it to the many readers of The Clay-Worker free of charge. Now the question is often asked me, why not have one door in the center of this furnace instead of two doors as given in my plans? One door is all right if the burner manages his watersmoking and burning in the proper manner. But I prefer two doors for the reason that sometimes from mismanagement one fails to reach the center of the kiln with the furnace fires alone. And having the two-door furnace enables the burner to slide wood to the center as readily as in the old-fashioned scove kiln. This, however, should never be necessary, but it is a very convenient arrangement when the necessity arises. And now an idea on kiln doors that is not original, for it has been given in The Clay-Worker before, but I think it is worth repeating.

Make the door of 8 common sized bricks, laid side by side and end to end, so as to be 16 inches square. Have your blacksmith make a clamp of iron to hold them in place. Then swing the door from some support above by a long wire so that it will hang directly over the furnace door. This makes a good shutter and as convenient as any I have ever seen. While firing it may be swung to one side, and when one wishes to close it it readily swings to its place again.

(To be Continued.)

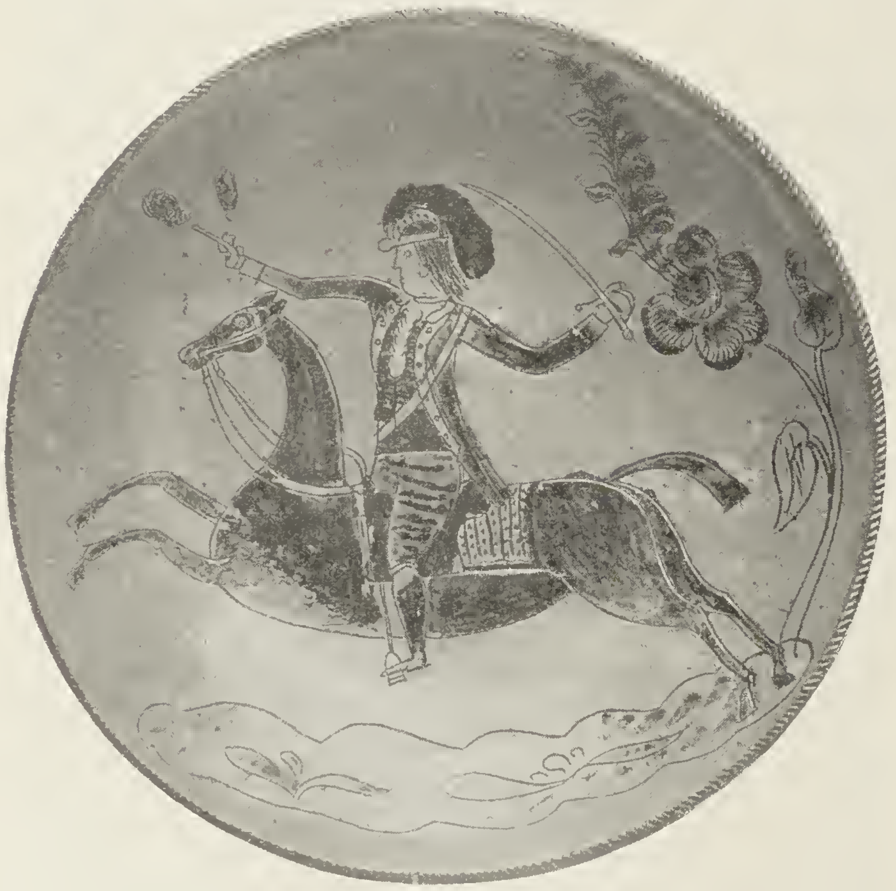
Written for the CLAY-WORKER.

BRICK CLAY POTTERY.

Old German Tulip Ware in Pennsylvania.

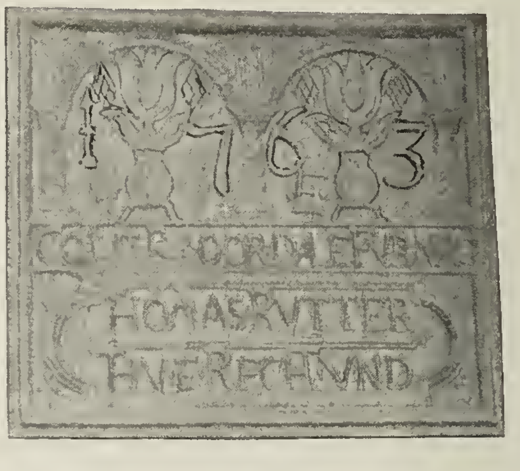
THE PRECEDING PAPER on this subject our compositor unaccountably made "pi" of our illustrations, that is to say changed them around so that not more than one was accompanied by its proper explanatory text. This one escaped, it is to be presumed, because by no manner of twisting could a mug be made to represent a platter, a pie plate or a vegetable dish; but we will not complain, since no serious damage was done. The errors are at once detected by means of the dates which occur on the vessels and also by their shapes.

As stated before this early earthenware of the German settlers in eastern Pennsylvania was made of common red brick clay and, in fact, pieces of the ware were not infrequently burned in the same kiln with the red building bricks and roof tiles. While of the coarsest and cheapest quality of pottery the makers placed on it the best and most artistic work they were capable of producing. We know of at least two artists in this line who excelled among these local potters. One was connected with a pottery that was operated by John Nase—his specialty being the representation of Continental officers on horseback; the other was David Spinner, an example of whose work was figured in the August number of The Clay-Worker, erroneously labeled "An Earthen Platter, 1826." We show here a second sample of Spinner's handiwork, supposed to represent a trooper of the Revolutionary war. While this piece is not marked, the peculiar ornaments and the serpentine shape of the spirited chargers indicate that the two plates were decorated by the same hand.



Pie Plate with Etched Design of Continental Trooper. By Dovid Spinner.

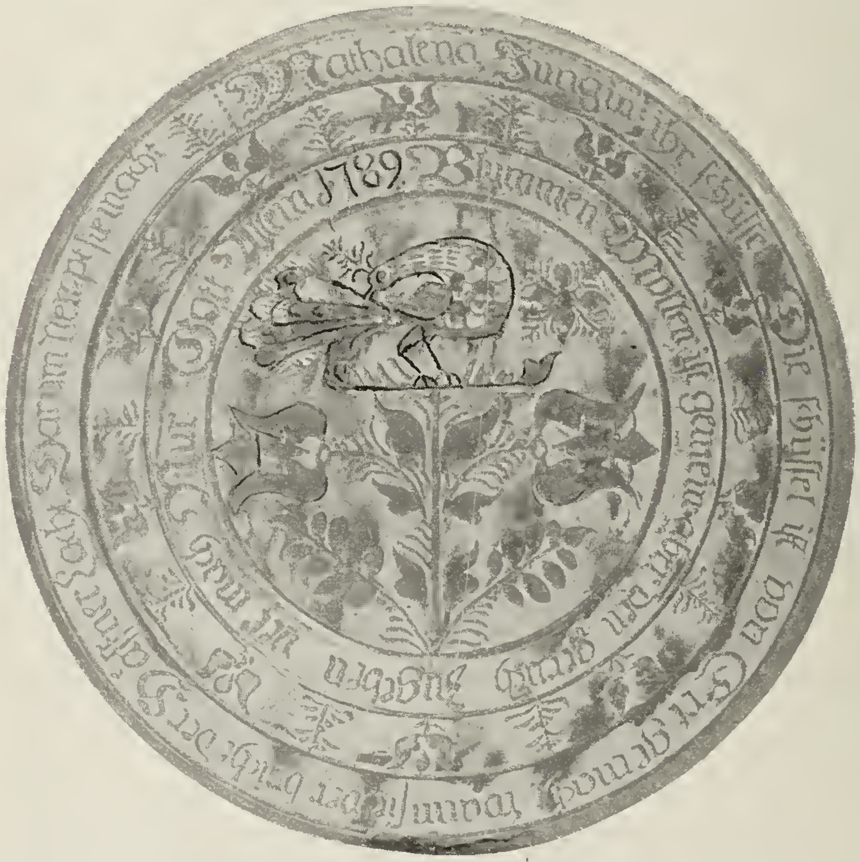
Not only was the tulip used as a decorative motto on the pottery of these people, but it figured on their tombstones and their iron stoves, in their illuminated manuscripts, their certificates of birth, marriage and death, as well. Mr. Henry C. Mercer has published a very interesting illustrated booklet on the subject of "The Decorated Stove Plates of the Pennsylvania Germans." In this he remarks that "The existence of plates of cast iron, about two feet square, elaborately decorated with biblical scenes, hearts, tulips, mottoes and scriptural quotations, recently exhibited in Bucks county (Pennsylvania) by its Historical Society, ought to be of general interest.



Old Pennsylvania German Stove Plate (1763.) Showing Tulip Decoration.

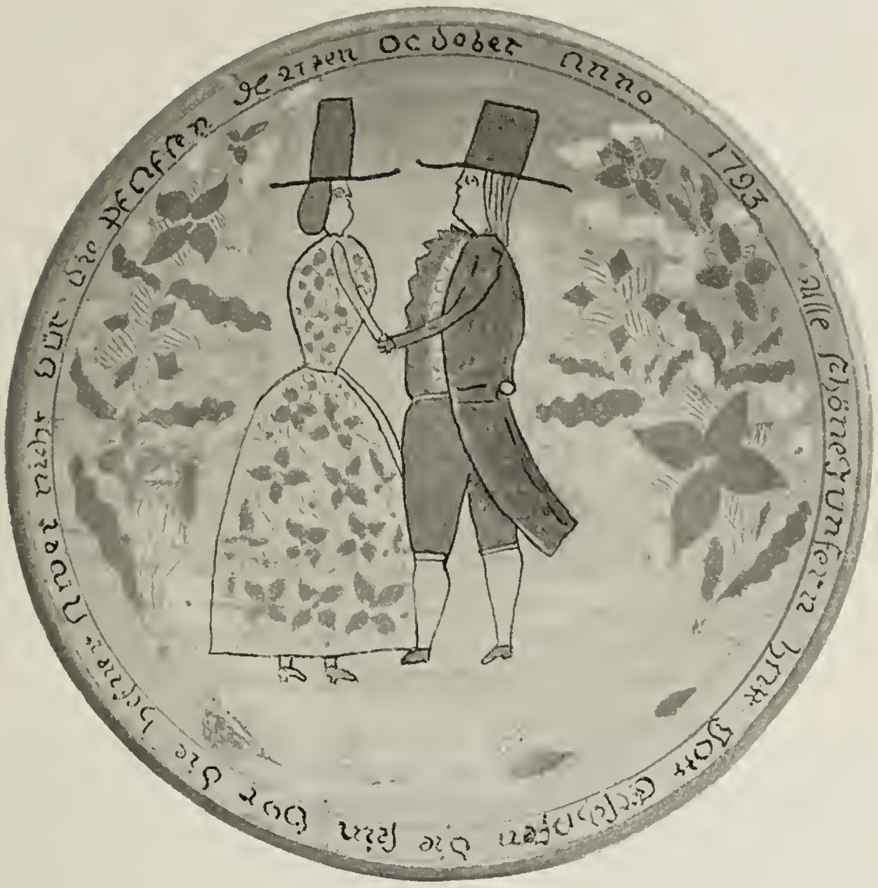
"Brought to light, like relics of a vanished people, they were rescued none too soon. Unvalued as things of beauty, unremembered, though they reflected fame of their makers, whose names had perished; abandoned to rust and weather, as pavings for fire places, smoke houses and bake ovens, as the sluices of dams and the bridges of gutters, the time of their utter destruction had almost come; yet historians of Pennsylvania might well be surprised that a leaven of art in the ingredients of colonial life, represented by these iron heirlooms, for a time regarded as facings for the backs of fire places, but finally identified as the component parts of stoves, had so completely escaped their investigation and notice."

We here figure one of these interesting relics, for the purpose of showing the presence of the tulip, which will be seen at the top, as a decorative feature in the useful as well as the ornamental arts of these people. This plate, intended for the side of a square stove, was, as its inscription shows, made at Colebrooksdale Furnace by Thomas Rutter, in 1763 (the year 1841 being the earliest date yet found in these iron relics).



Elaborately Embellished Gift Dish (1789). Two circles of Inscriptions.

Beneath the name of the maker is a portion of a German inscription (TUHE RECHT UND,—Do right and—), the balance of the motto having probably been carried over to the companion plate used for the opposite side. This interesting specimen may be seen in the fine collection of Colonial relics belonging to Henry C. Paxson, Esq., of Bucks county.



Decorated Pie Plate. Made for Wedding Gift in 1793.

Returning to our pie plates, the products of a sister art which flourished at the same time, an occasional example sometimes turns up which has been more than usually elaborately decorated. Indeed sometimes the incised work will cover the entire surface. Such pieces were generally intended for presentation pieces, such as the one here shown, which bears the name of the recipient, as is made plain by the inscription at top:

"Mathalena Jungin, ihr Schussel"—Madaline Junkin, her dish—while the date, 1789, in the poetical legend, gives the year of presentation. It is not often that a dish of this kind possesses two circles of inscriptions. In the center is the usual tulip, surmounted by a peacock preening his plumes. The workmanship and lettering of this dish are more than usually meritorious.

We come now to two even more pretentious pieces than we have yet seen, though perhaps not more artistic. One of these is a pie plate on which have been etched the figures of a man and woman standing with clasped hands. The entire design is incised through a coating of white slip, showing the bright red clay beneath, with here and there a dash of verdigris or dark green color in the glaze. The attitudes of the figures and their quaint and gay costumes are suggestive of a wedding ceremony, and this idea is carried out by the Pennsylvania Dutch inscription, which reads:

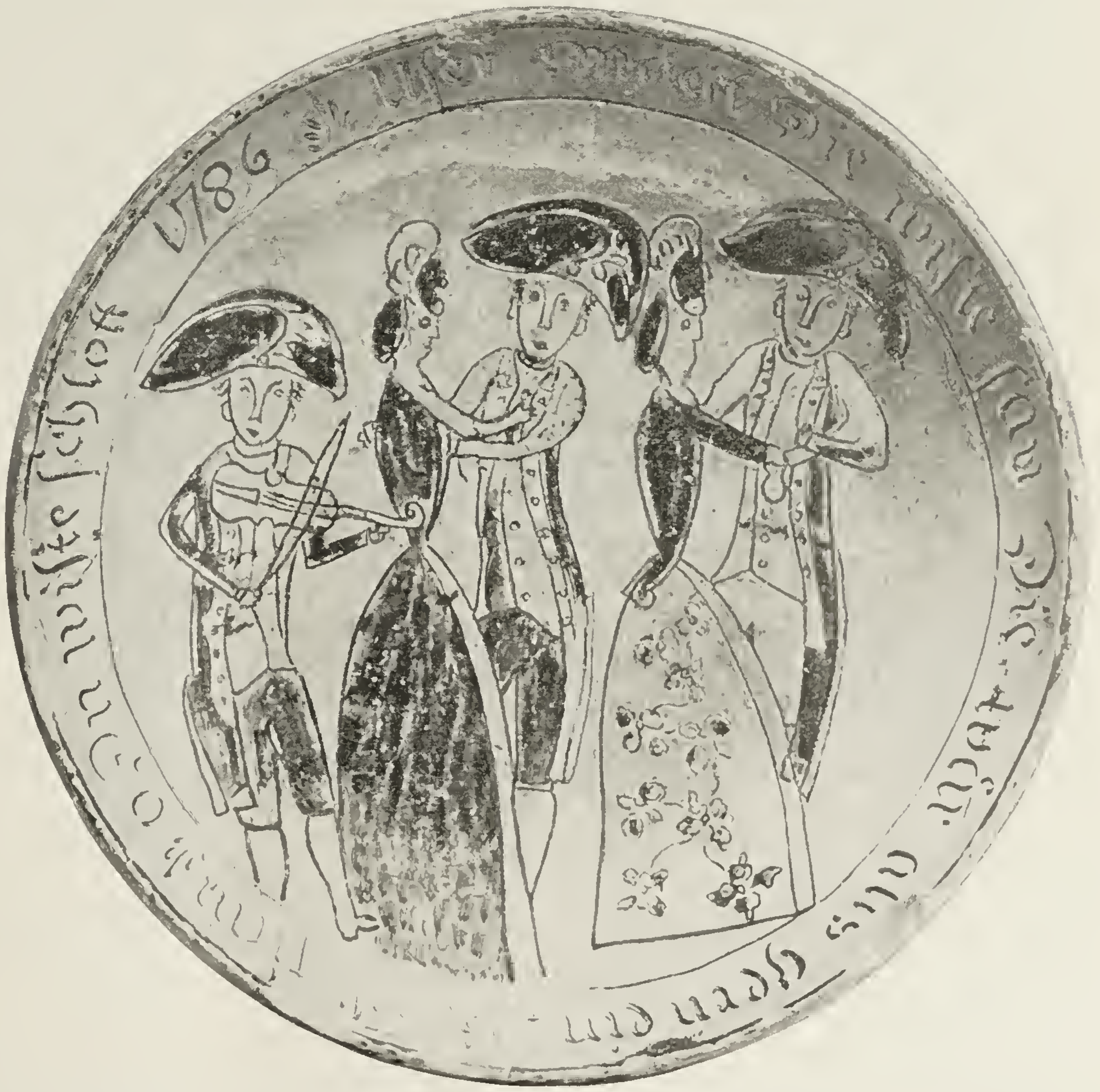
> "Alle Schone Junfern hatt Gott Erschafen die sein vor die Hefner awer nicht vur die Pfaffen, 21 ten Ocdober anno 1793,"

which may be translated

> All fair maidens has God created, they are for the potters but not for the priests.

This was intended, doubtless, for a wedding gift, the date of the happy event being the 21st of October, 1793. This very interesting design serves to give us a glimpse of the customs and fashions of the period in the German settlements of Pennsylvania. The tall hats of both the bride and groom; the arrangement of the hair in a net, and the tulip-figured gown of the former, and the queue and ruffled shirt front of the latter,—all surrounded by foliage and flowers, with turtle doves strutting beneath,—present a quaint and curious picture of a hundred years ago.

The second example referred to, while not so artistic in spirit, is, perhaps, more correctly historical than the one just described, for I believe the design to have been inspired by that famous and mose elaborate entertainment which was given to the British General, Sir William Howe, by his officers, on his departure from Philadelphia in 1778, commonly known as the Mischianza. It will be noticed that the date on the plate is 1786, some eight years later than the event illustrated, but in those days news traveled slowly and such a period of time might readily elapse before the German potter might think of utilizing the descriptions which penetrated to his inland settlement as a subject for ceramic embellishment. But when he did so he took the females of his own social circle, with their tulip-figured dresses and provincial bonnets, as models for the aristocratic dames of the fashionable city, while depicting the British officers in their red and green uniforms, with whom the fiddler was, apparently, of equal rank and importance. It is comical to see the stately minuet thus represented on a pie plate, but more curious to note the addition of an inscription which has as little reference to the subject as it has sense.



Old Pie Plate, Showing the "Mischianza" which was danced in Philadelphia in 1778.

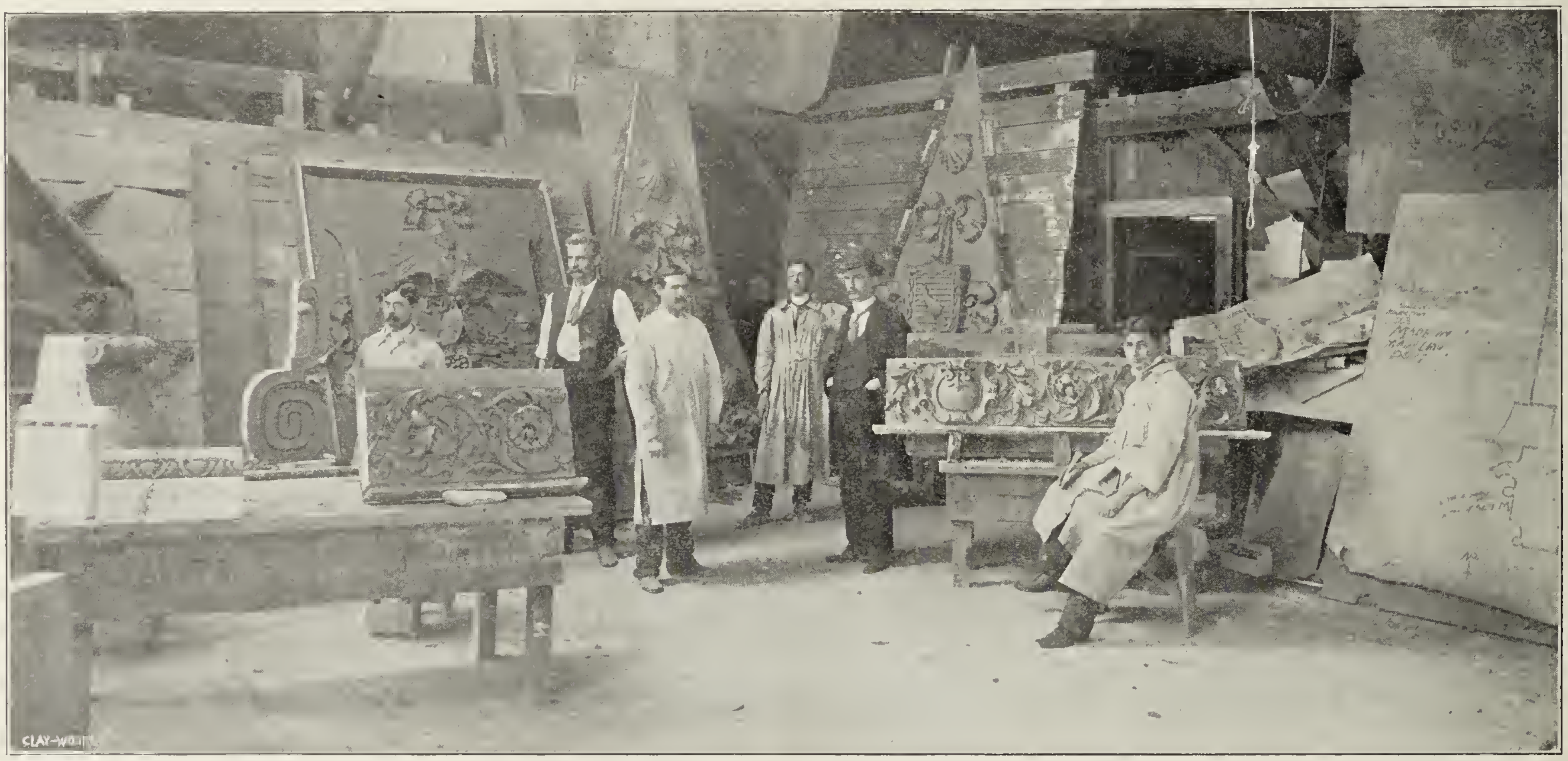
All the pieces of pottery figured in this article were produced either in Montgomery or Bucks county, Pa., the last three being, as their dates would indicate, more than a century of age.

EDWIN A. BARBER.

BY THE LIGHT OF THE KILN FIRE

ANOTHER and more startling incident than that related in the August Clay-Worker occurred to me early in my brickyard experience. I always used to pride myself upon the total ignorance of the meaning of fear in my make-up. But one night I sat up a "first night's" watch alone. Some idiot had set green brick in the scoving the day before and along about 3 a. m., when the steam began to work, the green brick crumbled and a "dull sickening thud," as the dime novels have it, warned me that either something had happened or was about to happen.

It had happened, however, and when I took the lantern and walked in around the dark outside wall of the kiln and saw the white brick glaring at me devoid of any semblance of wall or scoving, I felt an eerie feeling. A heap of shapeless mud, a window of crumbled clay alongside the bottom of the kiln, soon explained to me the cause and partially set my mind at ease. But I was nervous, more so than ever before in my life. Our yard was in a deep gully, shut in from the sight of the town lights by high hills, and a black cavernous wood half encircled it.



A Corner in the Modelling Department of the Brick, Terra Cotta and Supply Co., Corning, N. Y.

I had filled the arches along in the darkest hours before the dawn and had composed my frame for a half hour's siesta before day dawn. I had half closed my eyes and was thinking dreamily of the merry autumn when, work over, I would take the best girl and see the sights of the cattle show, when something, it was neither a noise nor an act of my own volition, but something caused me to raise my head and look up the bank toward the dark woods. Now, there is nothing more foreboding in its aspect, to my eyes, than a stretch of black woods in the dark, but when I looked toward it at this time my hair fairly bristled and my spinal column felt like a catch basket for a cracked ice machine, for there between me and the dark woods was a tall figure, clad in the whitest and longest robe I ever had heard of. My eyes bulged out and my hat removed itself from my head at the first sight of the motionless apparition, but when it slowly began to float toward me I came near to saying a prayer. I didn't run, but I would have run till I dropped dead had not my pride restrained me. The apparition approached close into the circle of light shown by the kiln and a strangely beautiful and kindly, and yet a somewhat sort of familiar, face looked stolidly at me. We stared at each other fully ten minutes that seemed to me a century. Neither moved. At last I braved myself for the ordeal and started to approach the apparition and solve the mystery of it. As I slowly approached it receded slowly, and as I increased my pace it also increased its rate of retreat. At length I ran at full speed, blinded with a fever of fear and fury. I floundered over fences, through ditches, stubbed my toes on hillocks and sprawled headlong into pits of muddy water, clamoring back to terra firma to pursue that terrifying Will-o'-the-wisp. It lead me toward our boarding house. It went into the yard and disappeared from my view as suddenly as if swallowed up by the earth, as if, like mist, the winds has dissipated it. At the same time a ghostly moan was borne to my ears on the night wind. It sounded to me like the wail of some lost soul, and I flew back over the road we had come. How I got through the night I do not know, but day soon broke. The crew found me a pitable sight when they arrived in the morning, but I have never given way to fear since.

"But what about the apparition, was it ever explained?" you ask.

Well, partly. The crew told me that we were minus one able-bodied hired girl this morning, as our old favorite was found with her collar bone fractured in the open hallway to the cellar, clad only in a long flowing white night robe, and they presumed she had been sleep-walking. But I never told them what covered my clothes with mud and my face and hands with evidences of hard contact with the earth, nor did I mention ghosts.

This matter of courage, like the question of ghosts, is one of many phases and every phase less worthy of rehearsal than the other. THE DREAMER.

THE VALUE OF A LAUGH.

I bless all the apostolic college of humorists, says T. De Witt Talmage. The man that makes me laugh is my benefactor. I do not thank anybody to make me cry. I can do that without any assistance. We all cry enough and have enough to cry about. God bless all skillful punsters, all reparteeists, all propounders of ingenious conundrums, all those who mirthfully surprise us with unusual juxtaposition of words. Thomas Hood and Charles Dickens and Sydney Smith had a divine mission and so have their successors in these times. They stir into the acid beverage of life the saccharine. They make the cup of earthly existence, which is sometimes stale, effervesce and bubble. They placate animosities. They foster longevity. They slay follies and absurdities which all the sermons of all the pulpits cannot reach.

Written for the CLAY-WORKER.

TERRA COTTA—ANCIENT AND MODERN.

WHEN THE ANCIENT MERCHANT of the East referred to his baked clay tiles upon which he kept his records of purchases and sales, or the historians of those early days carving a new event in his history upon one and straightway having it burned, they little thought to what vast uses that earth matter would be applied by a later people.

Clay, like all other things on this bountiful sphere, has passed through various stages in the advance of civilization.

First to our knowledge is the Egyptian keeping his records upon slabs of this material. Later, the Greek, who placed more value upon it, and made statues, urns and fountains to beautify his surroundings.

And so it has kept advancing, with halts here and there by reason of the troubles of history, until now we cannot turn our heads without seeing evidence of its various uses.

To-day it is a successful rival of stone in building construction and is capable of more variations.

In modern steel building it is often necessary to cut the clay pieces to fit the metal work, space for anchors, rods and cleats can be provided for in the soft material.

As to the ornamentation it is better in clay than in stone, as it has a softness of touch and a warmth of effect which is not produced with the chisel and mallet, and withal is much cheaper. This clay product as applied to the exteriors of buildings and general ornamental work is termed terra cotta, a name, however, which does not suggest its great value in the building arts.

The manufacture of terra cotta is of great interest to "an outsider" as he sees the numerous stages through which it passes towards its completion. And the ever-changing styles of work from the architects of different schools makes the manufacturers familiar with and capable of solving the different problems of construction.

There is considerable preliminary work necessary to produce terra cotta.

When the architect's drawings are received, they are given to the drafting department, where they are inspected and checked, after which a scale drawing is made, one-quarter to one inch to the foot generally, and the numerous parts "cut up" into workable sizes.

A duplicate copy of each of these scales is given to each department.

The draftsman then makes full size drawings, which on account of the shrinkage of clay in burning must be made to a larger scale than our standard rule, or about one inch larger in each foot. The drawings are then sent to the plaster department.

Here zinc templates are cut and mounted on wooden frames, which in turn are used to shape the plaster until it is set and the necessary outlines obtained.

It is then cut in pieces to correspond with aforesaid scale drawings, smoothed and edges sharpened, and turned over to the mouldmaker if plain, but if it is to be ornamented it is taken to the modeling department. Here these sculptors in clay mount the required design, which is copied from the architect's drawing.

This department is undoubtedly the most interesting part of the work. Designs of all styles are here represented.

Cornices from the Greek, here a Roman key, there a frieze in the Moorish style, and always changing.

Designs where one piece only is required is built up in clay, which, when finished, is cut in pieces and is ready to dry. But where a great number of pieces are to be made, the modeling is placed on the plaster, as before said, and returned to the plaster department to have moulds made from them. These moulds, after drying for twenty-four hours or so, are taken to the pressing department.

Then the actual work of making terra cotta has begun. The moulds are given to the presser, who may be working in clay of the same color which is to be used, together with a card stating the quantity required and the number of pieces to be given to the miter cutters, who in turn make all the angles, etc., necessary to each section.

After the clay has remained in the mould long enough to slightly harden, it is taken from the moulds and finished ready for the dryers. In the dryers the ware is deprived of the moisture which made it workable before, and all the thought spent upon it in making must now be complete, as it is past the stage of changing, without incurring great expense. When all the water has been driven from it, which is accomplished in about one hundred and twenty hours, it is taken by the kiln men on two-wheeled spring trucks down to the kilns. These immense ovens, with their high truncated cones, which are built to carefully exclude the actual fire and only allow the fierce radiated heat to come in contact with its wares, stand with open mouths ready to receive their burdens. They, when filled, contain a score or more tons of terra cotta, which depends upon the successful burning to decide whether it wil be salable or a loss. It hangs in the balance—it is the crucible deciding the value of the past labors.

M. E. GREGORY, Corning, N. Y.

The fires are built in recesses in the circumference of the hub, or bottom of the kiln, equipped with grates and connected with an intricate system of flues, to induce the fires to every quarter of the kiln, before its final passage into the outer air through the cone above. In a little over a week's time, after a gradual raising of the heat to the neighborhood of 2,800 degrees Fahrenheit, the last trial is drawn, which proves the burn to be finished. The fires are then sealed from the outer air and allowed to cool and temper until workmen can handle the burned terra cotta.

It is then taken to the fitting department, the workmen there laying the work out as it is to be in the building, using the inevitable factory scale drawing to prove that all is well and that attention has been paid to the minutest details throughout its manufacture.

In this department can be seen all the colors of native clay, besides those of the different stones which the trade demands in at least 75 per cent. of cases.

The last stage is loading the cars. The terra cotta is carefully packed with straw, to insure its safe and intact delivery to the stately mansion, office building or warehouse, or to the lowly tenement whose owner wishes to beautify at a low expense.

Building walls have also evoluted from the almost shapeless sun-dried adobe and straw-filled brick of the past to the handsome, square-edged and shapely brick of modern times, produced in colors little thought of a few generations ago.

And clays which were thought useless a few years ago are now used to produce the beautiful Pompeiian shades now in use.

We illustrate in this issue photographs of the Brick Terra Cotta and Supply Company's plant, of Corning, N. Y., of which Mr. M. E. Gregory is proprietor.

These works are situated on the Pennsylvania division of the New York Central Railroad, also on the Delaware, Lackawanna & Western and Erie Railroads, thus having the best of shipping facilities, as there are switches leading into each part of the works, which cover an area of several acres. The growth of the business has been phenomenal, as this plant has grown in a few years from a small common brickyard to one of the largest in the East.

The company manufactures architectural terra cotta and pressed ornamental and street paving brick, as well as the ordinary building bricks, together with fire clay and mortar colors. The superior quality of these products is widely appreciated and the demand for the company's product is very extensive.

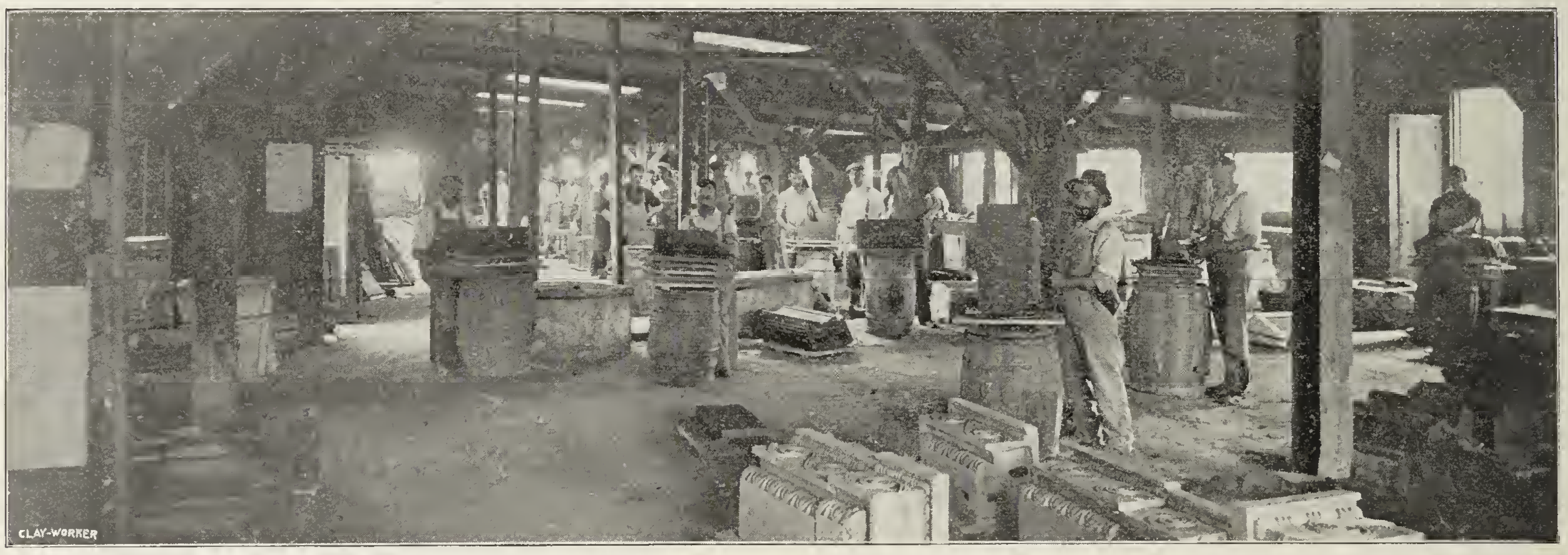
The company manufactures a fine quality of fine buff brick, which have an even color and are very dense, hence do not discolor when subjected to the action of the elements. These brick naturally are in great demand in the markets on account of their superior qualities.

The paving brick manufactured at Corning are classed among the best shale brick produced, and in the few years since they have been manufactured they have been laid in Corning, Elmira, Oswego, Binghamton, Geneva, Syracuse, Albany and New York city, and about two million are being laid this year in Paterson, N. J. During these years they have been tested thoroughly and have been found to be all that could be expected of a No. 1 street paving brick.

The brick are manufactured from shale rock and clay, and by combining these materials in proper proportion the ideal paver is produced. The shale and clay are passed through dry pans and pug mills, where it is thoroughly mixed, thence it is passed through an auger brick machine, from which it issues in a column of clay, which is cut by wires and thence conveyed to the repress, where the brick are repressed, corners rounded and stamped. The bricks are placed in cars and taken to the dryer, where they remain about thirty-six hours; from thence they are taken to the kilns, where they are carefully set for burning, it requiring several days to burn and cool. The kilns used are round down-draft kilns. Bricks are sorted as they are taken from the kilns by careful and experienced men, and only those thoroughly burned are shipped for paving purposes.

The red pressed brick are noted for their beautiful color and hardness. The company also makes a large number of common brick, which are noted for their rich red color.

In addition to its business, which is the largest in the western part of the State, the company manufactures architectural terra cotta, which is known far and wide among the building trade for its hardness and durability. This branch of the business has grown up in a few years from a rude affair to a thriving business, although the business is comparatively in its infancy. Terra cotta has been furnished from Kentucky and Illinois to Maine, and many large buildings are now monuments of this factory's chief product.



Pressing and Finishing Department Brick, Terra Cotta and Supply Co., Corning, N. Y.

Written for the CLAY-WORKER.

TILE DRAINING RAILROAD TUNNELS IN THE WEST.

CALIFORNIA RAILROADS are troubled with wet tunnels, the expense of which to maintain is considerable, as the dripping moisture keeps the ballast soft, while the rails work loose at the joints.

To overcome this difficulty the Southern Pacific company has adopted a policy embracing the use of a tile drainage system in all of the wet tunnels on its lines in this State and Oregon. Common four-inch drain tile is the material being used, and, as there are between four and five miles of tunnels to be equipped, the amount of tile will be very large.

The first to undergo the improvement was the San Fernando tunnel, near Los Angeles, Cal., which is the longest in California, being close to 7,000 feet. The company, instead of having the work done by contract, does its own work, but Gladding, McBean & Co. are supplying most of the material.

A Southern Pacific official, in an interview with a representative of The Clay-Worker, said that his company was purchasing a good deal of drain tile for tunnel work from the aforesaid firm, which story was corroborated by Gladdin, McBean & Co., who made their first shipment for use in the San Fernando tunnel, amounting to about 14,000 feet of material.

The tile is laid on each side of the track just below the gravel, with a little space between the joints, in order to allow the water to seep through and find an outlet in the pipes.

If the pipes were joined together it would be more difficult for the water to force its way through. The tunnels that are now tile drained are quite dry and easy to handle, while the road bed remains hard and safe.

The work is now being pushed with vigor in the wet tunnels on the Oregon division, and will soon reach the dark passages in California. Now that the Southern Pacific railroad has "set the pace" it is quite likely that the other railroad companies on the Pacific coast that are afflicted with this trouble will soon follow suit. The effect on the clayworking business, while not great, is, nevertheless, productive of good results.

SUNSET.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK. No. 20.

—Machine Structure.—

BESIDE THE NATURAL structures of clays we must also deal with the structure pruduced artificially by molding the raw material into the different shapes. This is a most important subject to the clayworker, since it deals with the very foundation of his art.

The natural structure of clays is of importance, inasmuch as it affects the general properties of the clay as a whole, but its effects are limited by the degree of fineness to which the clay is reduced.

For instance, if the structure of a raw material includes rock detritus reaching the size of pebbles the original structure may be changed by removing the pebbles from the clay. In this case obviously the orignal structure has affected the clay only to the extent of causing the trouble of removing the pebbles. Hence it may be said truly that the effect of natural structure is limited by the size of the particles into which the clay is broken up, and the finer these particles are the less will the original structure assert itself.

The destruction of the latter means, therefore, a modification, although not an entire removal of the effects of the natural mineral make-up. But it is known from the study of rocks that a decided structure always hastens the destruction of a rock or mineral. This is an important fact which should afford clayworkers a valuable lesson. Rocks most devoid of structure are the most enduring. Let us be impressed by this fact and be governed by it in the manipulation of our clays. Since structure is invariably antagonistic to durability, is it not evident that in order to reach maximum durability we must destroy and avoid structure as much as possible? And since we have it in our power to make a homogeneous product we have a great advantage over the stone men. The structure of stone cannot be changed, and in this very fact lies its inferiority.

It is to be regretted that all clayworkers do not seem to realize this point and make use of it. Some of us still continue to work clay right from the bank to brick machine without sufficient mechanical preparation, and, as a result, produce wares in which, to the natural structural defects, are added the artificial ones of molding.

—Importance of Fine Grinding.—

Have you ever realized the importance of fine grinding in the front brick business? In two Ohio dry press yards, located within several miles of each other, and manufacturing front brick from similar clays, the difference in preparing clay may be strikingly noticed. In the one yard the clay passes through a most thorough treatment of grinding, steaming and screening, including storing, while in the other the material is worked right from the bank and not screened very finely. The brick made by the first plant is of a beautiful even texture, a delight to behold, while the product of the less thorough establishment has, when broken, a coarse, lumpy appearance.

As one should expect, the well prepared brick is smoother and has a cleaner, more sharp cut appearance. Architects certainly realize this difference, and it is easy to tell which will suffer in the comparison. Thorough preparation and fine grinding, especially in the manufacture of dry pressed brick, will invariably pay. The case cited involves the destruction of the original structure of the clay. Let us now turn to the formation of structure in the shaping of clayware.

—Structural Defects.—

When we take some stiff clay and fill with it a mold without a thorough kneading, the piece of ware will be deficient because of the structure, the failure of all the clay to knit together uniformly. Its seamy appearance already will show it, and a piece of terra cotta thus made would invariably be rejected. Even the most careful pressing will not eliminate all the structural defects, but will do so sufficiently for all practical purposes. But if we take soft clay approaching fluid in consistency much more than the stiff mass, the difficulty will be overcome much easier, and structure will be avoided with much less trouble.

Let us now see how the machines which we use in manufacturing our wares behave in this respect. In order to do this systematically we will have to distinguish between the different types of machinery used, the soft, stiff and dry press machines. In the first class the molding approaches most nearly the hand molding process, filling a cavity under a comparatively slight pressure with soft clay as nearly approaching a fluid as it is possible to do.

A little consideration will show us that the formation of a decided structure cannot take place, and hence that in this respect a brick thus made, if well burned, ranks high in durability as long as the clay is kept soft. With the increase in stiffness the structure formation increases accordingly, and hence the quality of the brick suffers in a corresponding measure unless the pressure upon the clay is increased in proportion to the stiffness.

We are justified in saying "that the maximum freedom from structure is attained by molding a soft mass of clay under pressure, and that the formation of structure increases with the increase in stiffness, but is avoided if the pressure is raised and no flow of clay takes place."

—The Stiff Clay Process—

In the stiff clay machines the conditions are much different,

Plant of the Brick, Terra Cotta & Supply Co., Corning, N. Y.

the stiff clay in the prevalent type being forced through a horizontal or vertical cylinder by means of rotating knives and screws, and eventually forced through an orifice of varying dimensions.

In this class of machine structure is produced in two ways. First, by the way in which the clay is forced along being cut into slices, which are again united by pressure and the flow of the clay through a die. Any liquid or viscous mass in flowing through an orifice is subject to the laws of friction, according to which the middle of the stream flows more rapidly than the sides, thus retarding the outer portions of the brick and causing a strain which may result in more or less definite lines of rupture.

If the clay is weak in bonding power, although it may be quite plastic, it will show this fault in a most aggravating manner. The ruffled edges of auger brick are due to the same but less pronounced defect. For instance, some of the shales, especially those which are worked direct from the bank, and are not given time to develop their plasticity, are of such weak bonding power that they invariably show this faulty structure unless mixed with a plastic material.

Manufacturers of shale brick, therefore, who are troubled in this way, should make it a point to use the out crop, the weathered part of their shale uniformly mixed with the shale. It will not do to do the mixing in a haphazard way, but a definite system should be adopted which will result in the desired mixture.

Not infrequently one sees a plant which is troubled with the above complaint at more or less regular intervals simply due to lack of attention in regard to mixing. In all such cases it will prove desirable to store the clay in a shed so as to give it a chance to become mixed or to build a bin of ample proportions which will hold enough clay so as to represent a fair average of the face of the bank with the required amount of plastic material.

The writer has in mind a chute holding about thirty cubic yards of clay which was used to feed two dry pans. Being inclined some 50 degrees, it was not a difficult matter to feed the two pans by means of two gates, in fact a boy was able to do the work. In this cheap yet efficient way a mixture of shale and plastic clay was attained without trouble.

—Construction of Dies—

The faulty structure of brick caused by the passage through the die may be remedied also to a limited extent by rounding out and tapering the corners of the dies, a practice which is now generally applied. Also anything which will lesson friction at the side, the use of lubricants or of very smooth linings will decrease retardation, and hence partially overcome structural faults.

We now have seen that auger machines may have two inherent defects, one due to the action of the auger producing the so well-known laminations, and the other to the passage of the clay through the die. The same rule which we have found to hold good in considering the soft clay brick is true also for auger machines, namely, that the structure will be the less the softer the consistency of the clay and the greater the pressure applied.

The last factor, the pressure, depends upon the size and taper of the cylinder, the number and angle of the knives, the size of the auger screw and its pitch. From this it follows that the stiffer the clay the greater must be the pressure and power applied, and the greater is the danger of structure. That pressure is necessary to lessen structure can be easily proven by examining brick made when an auger machine runs filled with clay and when running nearly empty.

In the first case the pressure is at maximum for a given consistency, in the second at minimum. The brick made with the partially filled machine will invariably be found to possess a much more pronounced structure simply because the clay was not put under sufficient pressure to unite the slices of clay cut by the auger. Of course the nature of the clay itself is of importance in this respect. A very fat, plastic clay which, when cut by the blades, receives more or less of a polish does not reunite as readily as a leaner material, and it also has a greater tendency to form the concentric layers of lamination.

Our knowledge in regard to the proper construction of auger machines is as yet very limited and entirely empirical. A number of machine manufacturers, by dint of long and laborious experimenting and continued practice, have succeeded in producing machines which do the work satisfactorily for many clays. But to make the claim that a certain auger machine is suitable for any and all clays without a change is absurd, to say the least.

Every clay has its peculiarities, and, in order to establish a set of definite rules upon which auger machine practice could be safely established, a set of carefully made experiments would be necessary, whose aim should be to determine the conditions under which the least structure is produced.

Such work would be very extensive and laborious, but would result in data which would put our knowledge in regard to this subject upon a definite basis. The experiments would, of course, require the co-operation of machine manufacturers and clayworkers, and would involve the determination and use of the following factors: Size and taper of pressing cylinder, number and dimension of knives and auger blades, pitch and angle made by same, speed of auger shaft, ratio of cross section of cylinder to that of die, power applied to move say a cubic yard of clay in a given time, pressure, mechanical analysis of clays (coarse sand, fine sand, rock dust and clay substance), degree of plasticity, bonding power and amount of water carried by it. By testing say twenty typical clays in this manner, the entire so important subject of auger machines would be placed within the light of definite knowledge.

—Plunger vs. Auger Machines.—

Besides the auger machines there are used plunger and combination machines. In the plunger presses the lamination caused by the auger is obviously done away with, and there is left only the structure, due to flow through the die. But in place of the lamination there comes another defect, which, although not as bad as the former, still gives rise to considerable trouble, namely, the air bubbles found in the clay compressed by a piston. However, as a whole, the structure of the plunger-made brick is better than that of the auger.

In the combination brick machine, usually consisting of a vertical pug mill with a mud wing at the bottom, similar to that of a soft-clay machine, molding the clay with molds contained in a revolving table and afterwards compressing it by means of plungers, the clay is used quite stiff. Theoretically, this machine ought to produce brick very nearly free from structural defects, but, so far, the mechanical defects of these machines have not admitted of a fair trial.

The dry-press process, like the soft-mud, produces a minimum of structure—in fact, it is an ideal process in this respect. Its drawback, however, is that no plastic bond exists between the clay particles and that thus a very high porosity is produced. Structure defects can be entirely eliminated from this class of brick if the bottom plunger of the press, when the charger is in its position above the mold, is at its highest point level with the table, so that the clay dust does not inclose superfluous air nor is permitted to separate into coarser and finer grains on the way down into the mold, if the bottom plunger is at the lowest position. By means of repeated but gradual pressures the structure due to inclosed air will also be done away with.

Structure defects are the common trouble with many stiff-clay brick, and not a few manufacturers who think their plants superior to the soft clay or hand yard are making brick far inferior to the product of the latter, as far as structure is concerned. But how are we to distinguish clearly between more or less pronounced structural defects? To be sure, we can obtain a fair idea of the structure by merely inspecting them, but the practical test as to structure is best made by subjecting the burned brick to a rattler test, which, according to the writer's experience, will invariably bring out structure defects in the most striking manner.

AMERICUS.

HOW TO GET A CERAMIC EDUCATION.

Those of our young readers who are looking for a means of learning something more about clays and claywork than is acquired by the rule of thumb methods that prevail in most establishments can obtain it by sending to Prof. Ed Orton, jr., Columbus, Ohio, for a copy of the catalogues of the College of Engineering, Ohio State University. It tells clearly and plainly how to gain admission to the School for Clayworkers and what will be required after entering.

The first term of the 1899-1900 calendar begins Sept. 13 and closes Dec. 20. There are two courses in this department; the long (four years) course, which is designed to educate men as ceramic engineers, and the short (two years) course, which fit men for positions as burners, foreman, chemists, glazemakers or superintendents of clayworking plants. Ceramic education, while new in this country, has come to stay. Those who want to take advantage of the opportunities afforded by Prof. Orton's school, and they are many, are requested to address Prof. Ed Orton, jr., E. M., Columbus, Ohio.

Written for the CLAY-WORKER.

T. B. McAVOY'S SONS' NEW YARD AT FRANKFORD, PA.

A NEW SIGN supplants the old one of "Tom" Flood's, and new hands and fresh faces are suffusing a life giving and money making air to the good old location that yielded in the past plenty of work and money to the predecessor.

So here's long life to the good, congenial Flood and success to the newcomers, who need no formal introduction. As a family of brickmakers they are clean, upright and good workmen, and will leave behind them finger prints to help swell the pages of the Quaker City's history.

Alighting from the car at the corner of Nicetown Lane I made my way down the wagon drive, and soon found myself alongside of Aleck McAvoy, who has been drafted from the old stand down town to renovate and build up the new yard to meet all the contingencies of Frankfort's building requirements. And the chances are splendid, for right here city capital is being invested in healthy manufacturing plants, mills and tanneries, and this in turn calls for hundreds of two and three-story houses, essential to the living of the mill hands.

—No Frame Buildings Allowed.—

The building laws demand that these shall be of brick, no frame houses being allowed, hence the reason of the future possibiilties being of the best. Starting in about the first of March the McAvoys carefully went over the thirty acres, cleaning up, sampling the clays and fixing up the six to ten arch kilns, which give a capacity of a million and a quarter.

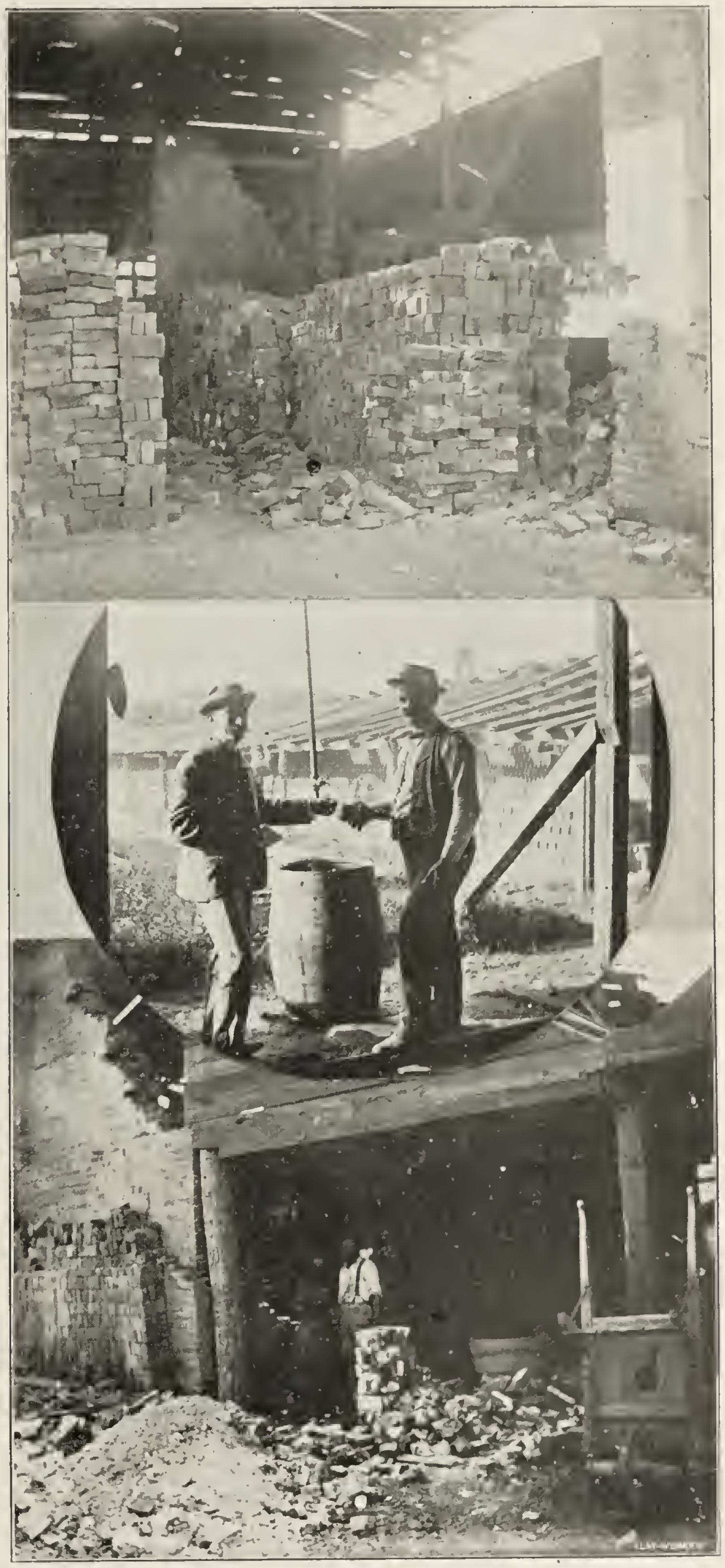
The Carnell machine all ready on the ground was fixed up, and from this some 32,000 can be turned out daily, and this they augmented with the Chambers machine and 180 horsepower boilers, three hand gangs and a pressing gang, thus giving a daily capacity of nearly 70,000.

Following this up with the introduction of a ten-tunnel hot-air dryer Aleck McAvoy started in to repress all of the Chambers machine output.

The racks needed attention, and they got it. In each shed they have fixed ten racks 180 feet long. This covers 150,000, and six sheds consequently give them a capacity of nearly a million and a half.

Aleck McAvoy warms up over his stretcher and repress brick. They are good and clean, well dressed and sanded; "and I don't think we need be afraid of putting them on the markets. When we came in we were pretty short of salmon, but I fixed that all right, and now we have got them to sell and burn, and I am starting in to supply the big leather factory that is going up over there that will take a million and a half. Oh! its a dandy! 960 feet long; a perfect kid factory, that is for shoes, but come, you had better take a drink; its hot and dusty around here;" and so over the tin cup we smiled, while he proceeded to further relate how the big sewer to be built would take any number of brick, since it would be large enough to drive a hay wagon through it—seventeen feet, center to center.

From morning till night "Aleck" keeps seventy men going and coming, and the old familiar cry of "say, have yer got a quarter about you," rings out in the clear air of the yard, as it does, and will always, I suppose, in all other yards, until all brick yards are turned into crematories.



Alex McAvoy and the Clay-Worker's Scribe drink to the Success of the Rejuvenated Flood Plant.

Good economic conditions exist, and this stalwart McAvoy, who by the by has put on eight or ten pounds more flesh since he took hold of the new yard, is careful of his men, stinting them in profanity, generously feeding them with a jollying word of encouragement and willing to resist them in a way, forestalling them in their efforts to draw their money a week ahead of time. This is a good secret in a brickyard; a man never works well when he finds he has little or nothing coming to him on pay day.

Aleck expects to turn out ten million for this season, and will keep the fires going until the time calls for him to help decorate the old homestead with holly and his own bright presence.
W. P. LOCKINGTON.

Written for the CLAY-WORKER.

TERRA HAUTE'S BRICK PAVEMENTS.

Practical Demonstration that Brick Pavements Properly Constructed are Neither Rough nor Noisy.

A VISIT TO THIS enterprising Hoosier city was prefaced by an interview in Chicago with W. P. Blair, of the former city, the secretary of the Terre Haute Brick and Pipe Co. While Mr. Blair would be measured up by any one who should make his acquaintance as a man likely to be modest and conservative in his statements, as we together examined the short piece of brick pavement laid on Michigan avenue, Chicago, he astonished me by a statement somewhat like the following: "The poorest piece of brick paving in Terre Haute will average with the best in most other cities."

Shortly after this statement was made we found ourselves on the ground at Terre Haute ready to reach our own conclusions concerning this matter, after viewing about eight miles of brick paving of which this bright Indiana city of about 40,000 people can boast. To those who do not know Terre Haute it may be said that it is a well built city, substantial rather than showy, having unusually fine hotel accommodations for a city of its size, and some large jobbing houses. One's first impressions are most favorable, especially if he leave the cars at the Union Depot, than which there is no prettier or more conveniently arranged in the land, for a city of its size, so far as we know, with its extensive environment of car sheds and its handsome and well kept park. The good impression is not lost as we reach its handsomely paved streets, and take in its business blocks and its comfortable lawn shaded homes, which seem to us to be built more largely of brick than is usual in cities of its size. We are told that while large capital is represented here there is a conservatism which prevents its ranking as a "pushing" city, but this is not in evidence to the casual observer. Located on the banks of the Wabash, and surrounded by a beautiful farming country, a portion of which to the city limits is underlayed with thick veins of a good grade of bituminous coal, the coal being overlaid with extensive veins of fine shale clays and underlaid with a thick vein of fire clay, it is entitled to rank, and in the future is sure to rank with Canton, O., as an important clay center. Its educational advantages are also first class, it being the home of the Rose Polytechnic Institute and of the State Normal School, with the usual endowment of public schools. Seven lines of railroads enter it, and connect it by direct line with the larger cities north, east and west of it, Indianapolis, the capital, being seventy miles to the east.

Referring now to the brick pavements, we may as well state in the outset that the statements made to us by Mr. Blair and before referred to were found to be as conservative as the city he represents, and that our visit has been full of

—Valuable Lessons—

as we esteem them in the paving line.

The assertion quoted as made by our Terre Haute friend will have the greater force in view of the fact that the oldest brick pavements of the city have now been laid nine years, and hence were laid at a time when the state of the art was comparatively in its cradle.

No doubt much of the credit for the high order of pavements which prevails here is due to the engineer who drew up the original specifications for laying the first sections. He was fortunate in having able advisers among the citizens who had been careful investigators of the paving question, and who were thoroughly practical and are perhaps entitled to share fully in the credit. Prominent among these were Mr. Blair and Mr. George Grimes, the latter a civil engineer of the contracting firm of Voorhees & Grimes.

Five year old Pavements. 1. Tippecanoe St. near Big Four Freight House, shows a Smooth Wearing Surface under Extra-ordinary Traffic. 2. Intersection of Ally between Ohio and Main Streets. A Perfect Sanitary Pavement.

Now as to the pavements themselves. The main business thoroughfare, Wabash avenue, was the first piece laid, and is a mile or more in length. We are informed that careful observations and notations made during the ten business hours of the day show an average passing of about 5,000 vehicles in that time, which may be considered as representing the volume of the traffic. I do not learn that any attempt was made to classify the vehicles such as is shown in the report of Engineer Wagner, of Richmond, Ind., and reported in The Clay-Worker. Besides this traffic there are double tracks for electric street cars, which always adds to the wear of a street by concentrating the vehicle traffic upon the balance of the street, and renders certain special wear on definite lines relative to the car tracks. It is this street, after its nine years of service, that our Terre Haute friend is ready to include with pavements laid later in his challenge as "equal to the best to be found in other cities," no matter at what date laid.

What is there peculiar in these pavements? you will be ready to inquire, in reply to which question we will present the leading facts concerning them.

First, the city has been peculiarly fortunate, as a rule, in the choice it has made of pavers. The first laid were of Canton, O., make, ordinary brick size (in that day these cost the city $18 per thousand, delivered in Terre Haute). It would not be easy to find better brick made in this year of grace. One observes no disintegration or wear upon the face of the pavers worth noting. Second, while the foundation upon which these pavers was laid would not pass inspection in Terre Haute to-day, it was of a high grade for the day in which the work was done. It was of crushed stone, the voids well filled with fine sand, and when well rolled cushioned with sand. Third, the contractor did his work faithfully, doing a fine job for the city, and report says an equally good one for himself. It is evident the foundations were well rolled, for the street has preserved its contour, and that the bricks after laying were equally well rolled, presenting an even face entirely without cant or inclination of face from a horizontal line at the time of the application of the filling. This filling was of Portland cement, used in proportion of one to one with sand, and the joints were well filled. As a consequence the street as a whole presents a more even surface than any street paved with brick which we had previously seen, and about the only defects to be found in this pavement to-day are to be traced to some removal of the pavement as originally laid and a less perfect relaying. Such defects, however, are few, and cannot be repeated under the present system adopted by the city for relaying. This system is

—Worthy of Notice.—

Under it Tom, Dick and Harry are not allowed to do any patching. The contract is let by the city for a period of five years to capable and responsible parties. At the present it is evident that this work is in the hands of experts in this line, who take pride in doing their work so well that their patches can hardly be distinguished from the body of the pavement. In an accompanying illustration (No. 2) two well-known paving brick men may be seen in the supposed attempt to follow the outlines of such a patch, and in No. 7 the same gentlemen have another patch under consideration, the outlines of which may be discerned by the reader.

Evidently this latter patch is to be found in an alley, and is not of the highest grade of workmanship as now performed.

The editor of The Clay-Worker was present during this examination, and the camera was in his hands which caught Messrs. Purington and Blair "in the act." Of these patches he writes us:

"The old pavements, or nearly all of the Terre Haute pavements, are strictly first class, while the patch, while not so bad as the ordinary brick pavements, is not nearly so good as the 'real thing,' " to which he also adds:

"I think it can be truthfully said that the patch of poor pavements is much better than ordinary brick pavements." We do not quite understand what is intended by the language "patch of poor pavements," for we know of no "poor pavements" of brick in Terre Haute. There are no patches of worn out pavements, but only where removal has occurred for repairs to pipes, extension of pipe systems, etc. But note the force of the language, "The patch is better than ordinary brick pavements," while in a previous sentence we have quoted him as writing "the patch is not nearly so good as the real thing." With such an incidental indorsement of the pavements generally while referring to the patch, we shall feel at liberty to express freely our opinions concerning them.

Quickly following the laying of Wabash Avenue, about a mile of brick pavement was laid upon South 6th Street, the same make of brick being employed, and the same methods, and specifications governing.

The photographic illustrations, 3, 4, 5 and 6, which accompany this paper are of the six-year-old South Third Street pavement. Only in Fig. 5 can the outlines of the individual pavers be seen—the reader will note the omission, and perhaps, think the photos defective. In our own attempt to photograph these pavements we discarded pictures as unsatisfactory on this account, and the illustrations given

Views of South Third Street Paved in 1893 with Veedersburg Brick, where Horses stand during the Day time the Year round. After a close Examination Engineer Grimes and Expert Purington can find no Rough Places or Defects.

were taken subsequently to replace them, and we may say to the reader that the difference discernable in the photographs in this respect is not greater than may be seen in the pavements as compared with the sand and tar filled pavements to be found elsewhere. While the cement filler was carefully brushed into the joints and the pavements were as quickly as possible thereafter sprayed to clear the face of the pavement from any coating of the cement; after nine years of service the wear has not even effaced the evidence of it from the face of the pavers, and, generally speaking, these pavements present one continuous smooth surface to the passing wheels.

It is needless to say that there has been

—No Call for Repairs—

on such pavements except as the pavement has been removed.

Let us take a walk down 6th Street in company with our friend Blair. We stop on the first block south from Wabash to take note of the sound of passing wheels. We are at a point favorable to this, since we have here an asphalt pavement (on Ohio Street) intersecting the brick—and just here we have a new revelation of what possibilities are wrapped up in a properly laid brick pavement. We note that the click of the hoofs of horses is as great on the asphalt as the brick, and that the rattle which we had before taken for granted as inhering to a brick pavement had almost entirely disappeared. As we pass down the street we find it to be one of the most beautiful resident streets of the city, and we note that the pavement is not out of character with the finest surroundings.

We are made to realize the advantage of having for a companion so careful and competent a student and observer as Mr. Blair. The defects of these early laid pavements are brought to our notice. A hollow rumbling sound apparent as vehicles pass by—at some points—is discussed and accounted for, the rounded stone curbings at corners of street intersections in some places cracked and displaced are also brought to our attention and the remedy suggested. Just here we are told, that on a hot summer day an explosion occurred, owing to the expansion of the brick, to which may no doubt be added the escape of heated gases, generated beneath the pavement by the sun's heat, which finding no other way of escape burst through cracks made in the pavement, the sound being heard for a distance of several blocks. This circumstance may serve to show how thorough was the job of cementing done, and also the need of a preventive or remedy against the injury wrought to curbs by expansion to do away with the hollow rumble and the liability to disruption by explosion, etc., which come from cementing together in one solid mass the vitreous facing to a street. We briefly refer to the generally accepted method already set forth in the pages of The Clay-Worker, viz., that of interposing a narrow (say ¾-inch) asphalt joint at proper intervals in the length of a pavement and also in each gutter which being softened by the heat shall act as cushions while still rendering the pavement impervious to the passage of water. In due course we will refer to later experiences obtained in this line.

Our attention is called, at another point, to the double action of expansion on a street curb, viz., the expansion of the pavement acting on one side of the curb, and the expansion of a stretch of cement walk extending from house to street and abutting at the outer end against the other side of the curb, the result being to break the curb and cant it over as shown in Sketch 1.

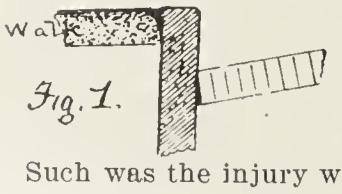


Fig. 1.

Such was the injury wrought to the stone curbing along this street that some of the property owners proposed uniting in a suit for damages against the contractor, but it was seen that his work was done according to specifications and that dame nature had simply followed her usual course, and was only saying "better take me into the account next time, for my laws are like those once attributed to the Medes and Persians in Nebuchadnezzar's day, only a little more so."

Another evidence of faulty construction is pointed out to us by our observant guide, shown by an occasional hollow sound under passing wheels continuing but an instant and covering but a few feet of the space passed over by a vehicle. Such places indicate, we are told, that the crushed stone foundation was at this point a little deficient in sand filling, and a slight hollow space was the result. To the writer this furnished

—Another Valuable Lesson.—

Had this pavement been filled with tar or sand at such points slight depressions would have been observed, but the pavement having been sustained until the cement filler had thoroughly set the slight curvature of the street and the thorough character of the filling had resulted in making a bridge strong enough to resist the weight of the heaviest loads.

Those of our readers who read our fourth article on Chicago pavements will perhaps recall the allusion to subsequent investigations made by us which had served to convince us that a properly constructed brick pavement could be depended upon to compete successfully with granite blocks for endurance under the heaviest service with several advantages in its favor, some of which were also noted. These well-cemented Terre Haute pavements with their almost unworn faces after years of service and with such capacity to resist—under the disadvantageous conditions noted — the weight of traffic, furnishes the first link in the chain of evidence, but there are others also. In this connection we were shown a pile of rubbish, made of an alley pavement taken up as a consequence of a fire and in the process of rebuilding. The thorough character of the work done in the filling was also in evidence here. The lines of fracture did not seem to have anything to do with the cement joints, they being just as likely to traverse the paving brick. The culmination of this line of evidence in Terre Haute came while examining the pavement in the alley, which had not been removed, and excavations were being made on either side. Heavy loads of building material and of merchandise had evidently for days been passing over it, and yet it was in places quite unsupported, on account of the crumbling away of the earth from beneath the pavement, leaving, as it seemed, in places, the track of the wheels of vehicles supported on one side by a simple shelf of cemented paving brick.

Mr. Blair and Mr. Purington contemplate a Poor Patch in a Good Pavement.

Of course it is apparent from what has been written that these early pieces of pavement—good as they are—are not all that could be desired. The two things needed were first a concrete foundation capable of holding in place a proper sand cushion, and then, the expansion joints to give and take as weather conditions make the demands, and this class of foundation characterizes all the pavements laid after those noted in this city. A section of 5th Street laid six years ago was the first piece representing this advance in methods and save in the matter of elastic cushions may be referred to as a good model to be followed. On this street we believe Veedersburg pavers were made use of and we cannot see why they are not equal in all respects to the Canton brick. street first to be noticed by parties entering the city from not promise to maintain for a long term of years the high standard set on the streets already referred to, and this is the street first to be noticed by parties entering the city from the Union Depot.

The general appearance of it is excellent, indeed it is a handsome pavement and would pass as first class anywhere, but if we compare it with other pavements in Terre Haute we would, on a critical examination, find that there is a surface wear, a granulating of the pavers which is entirely absent from the others. The difference lies only in the character of the pavers, which, while of a fair character, fall below the high standard set by those employed elsewhere in the city.

E. G. Durant.

A Seven-year-old Heavily Traveled Street so Smooth that Mr. Purington must feel of it to be Sure his Eyes do not Deceive him.

Written for the CLAY-WORKER.

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 2.

BY ALFRED CROSSLEY.

BEFORE TREATING of pure fire clays and bricks, or those of the second class referred to, a few remarks on the more humble, though scarcely less useful, impure fire clays and their products may not be out of place.

The deposits of lower grade fire clay that are more easily fused or vitrified are more common than the higher or refractory class. These clays, while often having about the right proportions of silica and alumina for a good fire brick, contain impurities or fluxing ingredients to such a degree as to cause them to readily vitrify at a good heat, and on this property depends their value for the purposes for which they are applied. They are always, or nearly always, plastic, which is also a necessary qualification. These impure fire clays find their highest adaptability and are of the greatest value in the manufacture of sewer pipes or paving brick. Some of these clays, however, contain iron in such a form or degree as to render them unfit for sewer pipe work, and yet, by proper manufacture, may be made available for paving brick.

It is only the latter that bears any reference, and that only as a brief side issue, to the subject of this article, and of which I now wish to speak and endeavor as far as possible to correct an erroneous opinion which has somewhat widely prevailed, though I think is now less prevalent than formerly. A fire clay paving brick is the somewhat paradoxical term that has often been used to describe one of the best, if not the best, paving materials that have ever been brought out in America and that has already revolutionized the condition of the streets in so large a proportion of the towns and villages in the country.

How paradoxical the term is can easily be seen from the fact that a fire brick that really is a fire brick is generally one of the very worst that could be used for a paving brick. The mechanical condition that is required in a fire brick—open, porous and of somewhat coarse grain—is the very opposite to the mechanical condition required in a paving brick, which should be dense and solid, extremely hard, yet tenacious, close grained, and, at least partially, vitrified. The value of a fire clay for a fire brick proper depends in a general way upon the practical absence of impurities, or fluxing elements, while the clay for a paving brick, even if a designated fire clay, must contain those very fluxing elements, the conditions being exactly reversed. Hence, to suppose that the same brick will answer equally well for a paving and a furnace brick, is manifestly a grievous and dangerous error, and yet a very large number of people are under just that impression, which I feel ought to be corrected. I have indeed met people who actually thought that the fine flint, or No. 1, fire clay would make the very best of paving brick.

The following analyses are of clays from widely different localities that may be regarded as fair specimens of fire clays suitable for paving brick:

	No. 1.	No. 2.	No. 3.
Silica	72.25	60.41	60.05
Alumina	18.08	24.94	20.00
Perox of Iron	8.57	2.30	6.82
Lime	.39	.20	.52
Magnesia	.02	.03	.45
Alkalies	.61	2.57	3.39
Sulphur	.....	.....	1.95
Water, etc.	.....	9.07	7.93
	99.92	99.52	101.11

No. 1 is from Yorkshire, England; No. 2 is from Lawrence county, O., and No. 3 is from Akron, O. In the first the vitrifying agent is the oxide of iron, which in the burning unites with the silica and forms a fusible silicate. In the second and third the iron is assisted by a considerable percentage of alkalies (soda and potash), which exert an even stronger influence than the iron. These and any similar clays will produce a good paving brick when properly manufactured, but will not make a refractory fire brick. I believe that at many of the collieries throughout the country a large quantity of inferior fire clay that is brought out and at present goes to the dump would make first-rate paving brick, and could be manufactured at very little cost. A large and profitable market could be found for them in the rapidly developing towns in the South and West, if the projectors and citizens would begin at the right end by providing good, brick paved streets as fast as buildings were erected. The health, comfort and convenience of the community would be promoted and the towns rendered doubly attractive to newcomers. I will not pursue this part of the subject further here, as it will be dealt with in an article on this particular subject.

Having endeavored to show the difference between fire clay suitable for paving brick purposes and that required for refractory purposes, and the opposite character of the resulting products, we are brought now to the consideration of the subject of fire brick proper.

Some years ago I had occasion to take some interest in the manufacture of pottery ware, and came to recognize the fact that for a man to be a successful, perfect potter in any but the rudest branches it was essential that he should have a thorough knowledge of the science of chemistry in its relation to the potter's art.

Perhaps I may be ridiculed if I say the same thing in regard to the prosaic and simple (?) trade of brickmaking, but the more I have studied this subject, the more firmly I am impressed with the same idea, and more especially as applied to fire brick. And there are not wanting signs that this same thought is taking hold of the most active minds in the craft to-day. A celebrated author (Lampadius) in reference to the science of metallurgy remarks, that, "If the metallurgist is not content to remain a mere empiric, it is, necessary that he should study several accessory sciences, especially if he aspires to the direction or management of works. He must acquire a knowledge of mathematics, physics, chemistry, mineralogy, mining, architecture, the cultivation of forests, drawing, finance, and political economy, some in their whole extent, and others only in part, with reference to special objects." At a cursory glance it is difficult to perceive the relation between some of these subjects and the science he was considering. A list even half as long as this for fire brick manufacturers to become masters of would cause a big majority to sit back awhile, and yet, is it not true that at the present time the business is carried on empirically to a very large extent, and without any pretension to scientific knowledge on the subject?

In order to prevent any misconception on the reader's part, I will say that I make no attempt to hide the fact that in my own experience, in the earlier stages particularly, I made mistakes which a proper scientific knowledge of the art, and others allied thereto, would have saved me from, and that I still have occasion to deprecate the lack of such a specific education and training.

It is the fashion among a certain class of men, who pride themselves on being practical, as opposed to theoretical, to sneer at all scientific attainments, forgetting the fact that the very knowledge that they possess they have either stumbled upon accidentally, been taught dogmatically by their fathers or others, or only acquired after years of hard experience and many mistakes. This they say nothing of, and entirely ignore an obvious truth, viz., that the man who not only can do a thing well, but can give scientific reasons for doing it, must be a better man than the one who, while doing good work, cannot give any reasons, nor the principles which govern his work. George Stephenson, the father of railroads and of the locomotive, whose genius revolutionized the industries of two continents, was an extremely unlearned man, but he had sense as well as genius, and, realizing his own lack of scientific knowledge and the disadvantage at which it placed him, was determined that his son Robert should have a thorough education to fit him for his life work as an engineer.

In the carrying on of any art or process of manufacture, in which the science of it has not been learned, the operator is but an empiric. A forcible and familiar illustration of this is in the practice of medicine. Lots of people have, at different times, found out that certain drugs or remedies give relief in cases of sickness, and have not unlikely administered them with good effect. But they have not the slightest idea of the active principles of those drugs, nor of the effects which they produce on the human system, nor how the patient is restored by them. Such a man we call a quack, or an empiric, and we don't want that kind of a doctor when we are sick, if we know it, for he is quite as liable to kill as cure.

In many lines of business scientific knowledge is not necessarily essential to success, but in fire brick manufacture it should be regarded as of the greatest importance, and the lack of it, observable to such an extent, is to be deplored. The fire brick manufacturer who aspires to thorough success, in order to conduct his operations intelligently, should, in addition to a thorough knowledge of his own business, also have a knowledge of the following subjects at least: Chemistry, geology, mining, mineralogy, in regard to fuels and the manufacture of coke in ovens, metallurgy in its different branches, as iron smelting, puddling, steelmaking, foundry work, etc., and glassmaking.

I have said previously that the first essential to good fire brick is the raw material in the shape of good fire clay, which suggests that some investigation be made as to its nature and characteristics. Back of these lie other questions. How many kinds of clay are there? What causes the several varieties? What is clay anyhow? These questions cannot be answered at random, and it is doubtful indeed if answers can be given that will be universally satisfactory. The subject of the origin, formation and nature of clays is both interesting and desirable to know as much as possible. Much as has been written on the subject, our knowledge is still imperfect, and there is a large field for further investigation. We need to inquire what constitutes both the chemical and physical characteristics of good clay and the difference in composition between clays suited to different purposes.

As regards the general characteristics of fire clay the following may be cited as definitions by different authorities:

"Clays are termed fire clays, or refractory clays, when they resist exposure to a high temperature without melting or becoming in a sensible degree soft and pasty. These clays differ much in degree of refractory quality. They occur in various geological formations, old as well as recent, but some of the best abound in the coal measures."—Percy.

"Fire clays are such as will withstand exposure to a high temperature without melting or sensibly softening. They are essentially hydrated, aluminous silicates, with more or less lime and magnesia in the form of carbonates, iron aspyrites, free silica, smaller quantities of potash and soda, with water in both the combined and hygroscopic form."—Greenwood.

"Fire clay is a substance which differs very greatly from the brick clays, and also, in many particulars, from the terra cotta clays, and the best fire clay for any special purpose is that which will, for the longest period of time, effectively perform all that can be reasonably required of it at the least cost for repairs."—C. T. Davis.

"In the production of what are commonly known as fire brick a very pure clay is selected, free from lime, soda, potash, or iron oxide, and usually a small quantity of fine sand is added to take up any alkaline matter that may be present, and, if this be not large, the clay will endure the highest temperature that can be produced, without softening or losing its granulated structure."—Brown.

"The essential characteristic of fire clay is the absence of fusible substances."—Stookey.

These definitions are perhaps none of them entirley satisfactory, while some paragraphs are somewhat erroneous and misleading, as I hope presently to show.

(To Be Continued.)

DON'T WORRY—WORK.

When the Spanish fire on San Juan Hill became almost unbearable some of the Rough Riders began to swear. Colonel Wood, with the wisdom of a good leader, called out amid the whistle of the Mauser bullets, "Don't swear—fight!" The advice is good for other places than the battle field. Translated into the language of every-day business life, Colonel Wood's order means, "Don't worry—work." Don't waste your energy in swearing, but take the time to shoot straight. Don't waste your strength in worrying and fretting, but save it all for work—intelligent, thoughtful, unremitting work. That is the policy that wins victories in trade as well as on battle fields.

Steady, dogged, concentrated work solves most of the problems of life. Fussy, fretful, timorous worrying only increases the difficulties ahead and robs one of the power to clear the real obstacles out of the path. Look out for the man who "says nothing and saws wood." Look out for the man who works and never worries. These are the men who are destined to stand as victors on the world's San Juans. The practical business man, familiar with all the details of his establishment, with a purpose directly ahead of him, and with a determination to reach that purpose, is the man who wastes no energy or time in worrying. He reserves all his strength to be coined into industry. He fritters away none of life's precious heart-beats in futile worry, but saves them all to be applied in productive work.

Concentrated, well organized, carefully conducted work, nine times out of ten, means success. Fussing and fuming and worrying over conditions, or competition, or this thing, or that thing, merely consumes so much vital force that should go into useful work. Every man possesses a certain amount of vital energy or life to spend in activity of brain or hand or otherwise. He may waste it in worry or he may use it in profitable work; he may consume it in drinking and excesses or he may invest it in building up a great commercial establishment; the point is that whatever he uses in the one he will not have for use in the other way.—Exchange.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

STATISTICS OF CLAYWORKING FOR 1898*

THROUGH the Department of the Interior there has been issued a volume of the statistics of the clayworking industries of the United States in 1898, by Jefferson Middleton. It is said that the United States is well known throughout the world for its statistics, and France is known for its individual bookkeeping, which, however, rarely takes the place of public statistics. In France the matter of the census is a small matter. It is announced that on a particular date the census will be taken—it is done in a night and within the next week the result is known. However, the census in the United States is a much more serious matter. It involves something more than population—it relates to the details not alone of the country at large, but the States, counties and individuals.

Mr. Middleton says the results of the canvass of the clayworking industries of the United States in 1898 are fully shown in the report. At the beginning of each season for several years the clayworkers have had hopes that prosperity would come, only to find at the end of the season that their hopes were futile. In 1898, however, the tide turned, and in spite of foreign war in which the country was engaged the clayworking industries were more prosperous than for several years. This is demonstrated by the fact that the number of firms operating in 1898 was about 7 per cent. greater than in 1897, while the value of the product increased nearly 15 per cent. In 1897 there was a slight decline in the product, but in 1898 the product exceeded the 1897 product by about $8,500,000.

Mr. Middleton says he is especially indebted to Mr. D. V. Purington, of Chicago, for his interest in the work and for his assistance in securing accurate statistics for Cook county, Illinois, and to the brick exchanges of several cities for their co-operation, and to Messrs. Campbell and Stover, of Trenton, N. J., for their efforts in securing complete statistics of the pottery industry in Trenton, and to Mr. John N. Taylor, of East Liverpool, O., for assistance rendered in securing pottery statistics.

The general tables show that the value of clay products in 1898 was $71,597,380, as compared with $62,359,991 in 1897, an increase of over $9,000,000, or nearly 15 per cent. This remarkable increase is due to a large output in both branches of the industry, brick and tile and pottery. The percentage of increase in the pottery product is much greater than that of the brick and tile products, the former showing a gain of 35 per cent. and the latter over 10 per cent. over 1897. By reason of this larger proportion of increase in the pottery products in 1898 they composed 19.49 per cent. of the total, while in 1897 they were but 16.53 per cent. of the total. In 1898 and 1897 the brick and tile products were 80.51 per cent. and 83.47 per cent., respectively, of the total.

In a table giving a comparison of the clay industries of 1897 and 1898, showing the increase or decrease of the several varieties of clay products in 1898, a study of the same shows that with the exception of the pressed front brick and the sewer pipe industries all of the important branches of the clayworking industries show an increase in 1898 over 1897, which indeed is not surprising, since the improved condition in trade, though sensibly felt in 1898, was not felt to the extent it has been in 1899, when an increase in the product along all the lines of clay industries may be looked for confidently. The common brick output, which unexpectedly and unaccountably fell off in 1897, recovered in 1898, and reached a valuation of nearly $30,000,000, which exceeded the product of 1897 by over $3,500,000. In 1896 the value of common brick was a little over $29,000,000. As already noted, the pressed brick product declined in 1897 to the extent of nearly 10 per cent. The vitrified paving brick product continued to show a gain, which should be still further increased in the future, since there is an increased demand for this class of products not only for paving, but for use in the erection of buildings and for other purposes. The fancy or ornamental brick shows a decline, though not so great as in 1897. Next to common brick fire brick shows the greatest gain. This is but natural, considering the activity in the iron and coke industries in the latter part of 1898. Fireproofing in 1898 shows a decline of $133,000. The pottery products show a great increase in value, as between 1897 and 1898, to the extent of $3,600,000, or over 35 per cent., as compared with a gain of 15 per cent. in brick and tile products.

The table showing the rank of States, giving the output of clay products in 1897 and 1898, is especially interesting. In previous years every State and Territory, excepting Nevada and Alaska, participated in this total. Ohio still holds the first place, the output in 1898 being nearly $12,500,000, or over 17 per cent. of the total output, as compared with a little over $11,000,000 in 1897, which is a gain of 12.15 per cent. This gain in Ohio comes principally from the increase in the pottery products, though the brick and tile products also show large gains, the relative proportion of gain being 77 per cent. pottery, 23 per cent. brick and tile, or about nine millions and three millions, respectively.

JEFFERSON MIDDLETON, Clay Statistician, U. S. Geological Survey, Washington, D. C.

As for the last four years, Pennsylvania is second, with a product of over $9,600,000, or 13.47 per cent. of the total in 1898, as compared with $7,800,000, or 12.63 per cent. of the total product in 1897, being a gain of over 22 per cent. In this State the pottery products also increased more proportionately than the brick and tile, though the actual gain in the latter products far outstrips the former. As stated in the table, Pennsylvania leads the country in the production of brick and tile.

New Jersey is third in rank, with a total of over $8,500,000, or a little over 12 per cent. of the aggregate for the country, as compared with $6,000,000, or 9.91, in 1897. New Jersey owes her rank among clayworking States to her pottery.

Illinois, which occupied fifth place in 1897, has displaced New York, which was fourth in 1897, with a product of over $5,500,000, or 9.01 per cent. of the total. Indiana and Missouri retain their positions of sixth and seventh. Indiana's production was valued at over $3,200,000 in 1898, or 4.49 per cent. of the grand total, as compared with 4.35 per cent. of the total in 1897.

It is interesting to note from these tables that the number of common brick made in 1898 was 5,669,360,000, valued at $29,961,992 at $5.28 per thousand, as compared with 5,292,532,000, worth $26,430,207 at $4.99 per thousand in 1897. In 1896 this class of brick constituted 42.38 per cent. of the total product—in 1898 it was 41.85 per cent. of the total, while in 1896 it was 47.74 per cent. of the total.

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*Extracts from the twentieth annual report of the Survey 1898-99, Part VI, mineral resources of the United States, calendar year 1898. David T. Day, Chief of Division of Mineral Resources.

New York continues to be the largest producer of common brick, reporting 900,977,000 brick in 1898, as against 828,868,000 in 1897, in spite of the protracted strike in one of its chief producing centers—Haverstraw. The total value per thousand in this State also increased from $4.41 to $4.86. In 1896 New York's production of common brick was 931,565,000, valued at $4.45 per thousand. Pennsylvania and New Jersey and Ohio are the largest producers in point of value of pressed brick in 1898, 1897 and 1896, in the order named.

The value of vitrified paving brick produced in 1897 increased over that of 1896 about 28 per cent. If this rate of increase had been maintained as was expected, the product in 1898 would have been over $4,500,000, but the increase was only 9.5 per cent., and the value of the product in 1898 $3,900,000, as compared with $3,600,000 in 1897. The average value per thousand was $8.22 and $8.48, respectively, for 1897 and 1898. Notwithstanding the small increase in this product in 1898 over 1897, it is a branch of industry that is sure to gain in importance, not only on account of the increased use of the product for paving material (for which it is certainly admirably adapted, especially in the smaller towns, so says the report), but on account of the desirability of this class of material for many other uses, such as for building foundations, sewers, etc. As in former years the region of the Mississippi and Ohio valley, comprising the States of Iowa, Illinois, Indiana, and Ohio and West Virginia, produced nearly $2,299,000, or 64 per cent. of the product, and in 1898 they produced nearly $2,281,000 worth of the vitrified paving brick, or 58 per cent. of the total product. Ohio, Illinois and Pennsylvania were the largest producers of this product in 1898 in the order named, while in 1897 the order was Illinois, Ohio and Iowa.

The fire brick product, which shows a decrease in 1897 of $850,000, or 17 per cent., went from $4,000,000 in 1897 to $5,597,000 in 1898, an increase of 36.27 per cent. over 1897. This large gain is, of course, due to the increased activity in the iron and smelting industries and the accompanying increase in coke industries.

The drain tile product, which made a gain of only $9,000 in 1897, increased $402,000 in 1898. As in former years, this product comes almost entirely from the middle West, Iowa, Illinois, Indiana and Michigan producing in 1898 $2,700,000 worth of drain tiles, or over 90 per cent. of the total product.

The ornamental terra cotta product increased from $1,800,000 in 1897 to $1,980,000 in 1898, an incrase of 7.52 per cent. In 1897 the total product declined $518,000 as compared with 1896, or 21 per cent. New Jersey, Illinois and New York continue to be the largest producers of this material.

The fireproofing product shows a slight decrease of from $1,979,000 in 1897 to $1,846,000 in 1898, a loss of 6.73 per cent. In 1897 this product showed a wonderful increase over that of 1896, being about 16 per cent., and it seems strange the increase did not continue in 1898. New Jersey, Ohio and Illinois are the chief producing States.

A table in this report showing the rank of States in the output of brick and tile product, as distinct from pottery, and the percentage of the total made by States in 1897 and 1898 will be of interest to those engaged exclusively in this line of the industry. These tables show all of the States and Territories participate in this total, excepting Nevada and Alaska. When these products are considered it is well to observe that Pennsylvania is the leading State, with a product of nearly $8,700,000 in 1898, or over 15 per cent. of the entire product, while in 1897 she produced 3.78 per cent. of the entire product. Ohio was second each year, producing in 1898 11.54 per cent. of the product and in 1897 12.19 per cent. of the total. The other States vary but little. In 1897 and 1898 New York and Illinois were third and fourth, respectively, New Jersey was fifth, and Indiana and Missouri exchanged places, Missouri advancing from seventh in 1897 to sixth in 1898, and Indiana falling from sixth in 1897 to seventh in 1898. Iowa, which was ninth in 1897, became eighth in 1898, exchanging places with Massachusetts. Some of the other notable changes are Texas, which was eleventh in 1897, fell to nineteenth in 1898, and California, nineteenth in 1897, rose to tenth in 1898, Connecticut and Rhode Island, occupying tenth place in 1897, fell to fifteenth in 1898, while Michigan rose from sixteenth in 1897 to eleventh in 1898, and Minnesota from twenty-second in 1897 to sixteenth in 1898.

—The Average Price of Brick.—

A table showing the average value per thousand of several kinds of brick made in 1898 is especially interesting to those engaged in the commercial side of brickmaking. From these tables it appears that the price of common brick in 1898 ranged from $8.05 in Wyoming to $4.13 per thousand in South Carolina, while the average for the whole country was $5.28 per thousand. In 1897 Wyoming and New York were the extremes, with $7.24 and $4.41 per thousand, respectively. In 1897 the average price in Tennessee was almost identical with that of the United States, and in 1898 that State most nearly approached the average, $5.28, it being $5.26. The average price of pressed brick, including buff, gray and other fancy colored brick, varied in 1898 from $21.99 in California to $6.64 in Michigan, the average for the whole country being $12.11. In 1897 the same States were the extremes, with averages of $37.90 and $5.28 per thousand. The vitrified paving brick varied in price from $14 per thousand in New Jersey to $5.45 in Utah, while the average for the country was $8.48. In 1897 California and Tennessee were the extremes, with an average of $15 and $6.25 per thousand, respectively, and the general average for the country was $8.22, while in Minnesota and Maine this product is reported with much higher averages. Still the output is so small that the prices can hardly be considered as representative of the value in those States.

As to the matter of pottery products in the United States in 1898, the report shows it was $13,952,000, as compared with $10,309,000 in 1897, a gain of over 35 per cent. It is also shown that the operating firms report a gain in number of over 14 per cent., which shows that the pottery industry was in a more prosperous condition in 1898 than in 1897, which is undoubtedly true. Its percentage of the total clay products in 1897 was 16.53 per cent. and in 1898 19.49 per cent.

The table showing the rank of States in which the production of pottery, together with the value of the product of each State and the percentage of the total product made by each State in 1897 and 1898, is of continued interest. Ohio still leads as a pottery producing State, with a product in 1898 valued at over $5,700,000, or over 41 per cent. of the pottery products of the country, as compared with $4,700,000 in 1897, or 45 per cent. of the total. In 1897 there were 95 firms operating in this State, while in 1898 there were 108 firms reported. New Jersey is the second State, with a product of over $4,000,000, or nearly 30 per cent. of the total product, as compared with 19.26 per cent. of the total in 1897. It is only fair to state, however, that the figures for New Jersey for 1897 were below the actual output, on account of a large number of potters making no report for that year.

This report is of special interest to all clayworkers in the United States. Copies of the complete report may be secured through Mr. Middleton, or by addressing the congressional representative of the district in which the individual interested resides.

CLAY SAVINGS BANK.

Made in Imitation of Jugs and of Various Kinds of Fruit.

Children's savings banks of clay are made in a variety of forms, including apples, pears, peaches, oranges and little jugs. They are formed out of clay and baked in the usual manner, and they are then painted in colors in imitation of the fruit or other object which they represent in form. They have but one opening, that being the slot through which the money is dropped. To get the money out again it is necessary to break the bank.

Such banks are sold for the ordinary purposes of a child's savings bank. They are always pretty certain to be among the things offered for sale in five-cent stores or in stocks or lines of goods in which everything is offered at a uniform price of five cents, that being the retail price of the clay savings banks, and they are often used to collect money in for charitable and benevolent and other purposes. Sometimes the breaking of the jugs used for charitable purposes and the counting of what they contain are done in public. For such uses as these the clay banks are sold by the hundred. These clay savings banks are made in this country and are sold in considerable quantities.—Exchange.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

FLOOD TIDE in the affairs of men, if taken advantage of, leads to wealth, for which all are striving and but few obtain. As one looks over the field of brickmaking it seems that a good many think that the flood will come their way "sometime," while the ebb tide is slowly making, and finally becomes too strong for them. The theory of tides is a matter that some may think they can explain; the moon is the factor which controls the movement. Admitting it does, how is it that within a few miles of each other, in one harbor the water will raise several feet more than in the other? Just so, one manufacturer makes money, while the other struggles along. The one may be progressive, to a certain extent, the other drifts along, strong in his belief that all will come out right. The flood tide of this spring's prices brought out that hope ever present to the brickmaker that he had struck an East river tide, which is always on the rush, and, when it stops running flood tide, it is on the ebb at once. From personal observation I have seen the buoy on the reef at the foot of Tenth street, East river, in a minute's time from indicating tide running flood turn to ebb. So it has been in the trade: nearly a seven dollar market, to ebb, or prices soon followed in the face of all indications, which were counted on to keep a steady current throughout the season. It would seem that the producer will have to wait, Micawber like, till some one else creates a steady tide.

—Changes in the Trade—

Are gradually taking place, and I think that no class of manufacturers have been so slow to take advantage of improved methods as tide water men. It seems as if they had struck a rut, and could by no possible means get out of it. The majority of the yards being leased, it would not pay to spend a very large sum in improvements for five years. The tide water manufacturer is not much given to traveling, and, as a consequence, he does not see plants in the other States. He says, "Yes, I hear that they burn with coal and oil, and that is the end of it. He is not interested at all. He thought his plant was the acme of perfection. Like the tide, a change came, younger men, and men who invested capital without knowledge of the trade, gradually changed the old system in the way of output, and gradually other changes followed.

Croakers are always to be found. If any of the others should begin to try other ways or different machinery, "Oh, he will bust up!" will be heard. Within the past few years, if one more progressive should talk of or make an attempt to depart from the beaten path of brickmaking, they would predict his ruin.

—From Wood to Coal.—

Necessity, the mother of invention, has taken a hand in the matter which is going to completely change the fuel now used in burning, namely, wood. Four years ago one of our manufacturers put up a small kiln and sent up the Hudson river for a man to burn it, in the hope that it might be a success, which it was. It showed that brick could be burned, but the waste was so large, and the very low price of brick did not permit of continuing.

The present season wood is very scarce, and, in fact, dry wood is out of the question. The same conditions exist in Haverstraw, as the supply comes from South Jersey and Long Island. The one is a species of pine, the other oak, but not over three feet long. It makes expensive fuel, so that the scarcity of wood created the necessity of some other material to burn, and as coal has been in use in other sections it naturally follows that it will be the coming fuel.

The kiln used is just the same as for wood, except the arch is higher. Like all other kilns, improvement comes by use. The first kiln was set four feet high in the bottom, with pale brick. At present hard brick are used, which is saving. When shipping, those four courses can be loaded on the barrow and sent to the vessel, while if they were pale they would be taken up and wheeled away and put on a pile.

As the four courses from the ash pit the grate bars are laid over and wrought iron bars three-quarters of an inch square are laid on—not necessary when setting up the arch, as the arch is high enough for one to get in. In the middle of the ash pit a few bricks are set in to divide it in two. The usual height of bench and jet brick are set up. The four bottom courses extend half a brick outside of the walling and a piece of iron is laid across the ash pit and the wall is laid on each end, which holds it in place. The use of this piece of iron is to slide the doors aside. In the earlier kilns this was not used, and the doors had to be set aside when the door was cracked on account of the heat. The usual arch iron and door is used with a square sheet iron, with a piece riveted on for a handle. The kiln is walled just as wood kilns would be. It certainly is a simple outfit, if it will do satisfactory work.

—The Great Drawback—

Is on the part of the boss, who is fearful of loss, and in the foreman's fear that he will not make a good burn, and the result will be known far and near that he burned a coal kiln and it was a failure. He has never had any experience with coal, and knows nothing about the heat of coal, and he does not care to take the responsibility. The boss says, "If I could get some one who had had experience burning with coal I would start a kiln." That is not possible, as there are not men enough to go round. There are just as good men burning wood, and fully as competent, and I believe would make better burns than many of the experts with coal, if they were given the chance.

—The Remedy—

Seems to me a simple one, and one which can be easily met, and that is by a thorough understanding between the boss and the foreman. Let the foreman know that you would like to have him try, and will stand by him, whatever the result. Tell him you are confident that he can do it. Remove the fear of blame if he does not do as well with wood. He had to learn to burn with wood, and at first did not succeed as well as later, as the knowledge was gained by personal responsibility. I base my argument on observation.

—A Case in Mind.—

One of the proprietors for the past two years has spoken to his foreman about trying to burn with coal. However, his having no knowledge of burning with coal gave the boss no encouragement. Finally the boss told him to start a coal kiln, an he would help him and be satisfied with the result. He followed orders, and put up a six-arch coal kiln and started to help burn it, but soon found out that he must do it all himself. The kiln was of wash brick, and, when it had been afire one day, the arch next the outside began to pop, and did not stop till it reached from the top of the arch to the top of the kiln, three brick one way by five brick the other, filling the arch, as well as making a complete chimney through which the heat was drawing.

Here was a "category," as Captain Lynch would say, and very discouraging to begin with, and for less cause many foremen in days past have taken recourse to the whisky bottle. He was in it, and he meant to do his best, whatever came of it. He filled the hole with pale brick as best he could, and kept at it. When that kiln was opened it was a surprise to many, as they found that the unexpected had taken place, and a fine kiln of hard brick was the result, and what other men say in the same line of trade goes, as they are not given to credit other men's work.

Before a stick of wood was set fire to I heard several pronounce it a "pale kiln." They knew it because the foreman knew nothing about burning with coal. No man did know less about coal as a burning factor, and I predict that this man will have as good burns with coal in the future as he is doing and has done in the past with wood, and that is as good as any one need want. The next kiln will see an improvement, and, to the credit of the boss, I will say that before that kiln was out he had another one started. He was so well satisfied by the looks of the platting that he was willing to keep on with coal. What one man can do another can do, as has been abundantly proven, at present as well as in times past, and I am well satisfied that any foreman who wants to be up to date has got to master the burning of brick with coal.

—It Has Come to Stay,—

And certainly every foreman who burns brick should hasten the advent of it. He will not make as much overtime as with wood, but sleep is of more moment than the few extra dollars, not to mention the hard work around a wood kiln. To burn with wood means to go along and fill up when heating up, turn around and do the same thing over again, and keep on doing it till daubed up. If there is any hard, trying work to be found you get the benefit. Wood will burn up all too quickly, and then you have to pull down the woodpile to get small wood, for of late years the wood has run entirely in large pieces. Now turn to the boss and see what it will do for him. First and foremost the saving is something to be thankful for, and the majority of the manufacturers have not found what a saving there is—only by hearsay, and they cannot believe it, it seems.

In conversation with one of the younger brickmakers about the plant I asked if he had started to set up a coal kiln. He said: "Sure, and why not? It beats wood all to death. Yes, it costs far less than wood." When he said "far less" I supposed that he probably meant a 15 or at the most a 20 per cent. per thousand saving—a great item towards profit. I was curious to know for what he could burn them, but, being a stranger, it was a delicate question, but, Yankee like, I kept asking questions until he told me. He said: "As you see, we have not burned any on this yard, but on the other we burn them for 27 cents per thousand." I looked at him to see if he was trying to mislead me, as I could not believe that the figures were correct; that he had a stranger, and that he would "load" him. "Twenty-seven cents per thousand" kept coming up as I left him. "Impossible" was the only word which would fit the place. It is generally the case in trade to make the cost high, but here was a case of absurdly low. Is it any wonder that my faith in his veracity was sorely tried? As I walked along, and the evidence was accumulating fast that all or nearly all were changing from wood to coal, I concluded that there must be a saving, but not for a moment would I credit the 27 cents basis.

I reached one of the largest plants, with which one of my old school friends was connected. Here was my chance to prove that it cost more than the figure quoted. "What saving is there between wood and coal?" I asked. "It means to us a saving of about $15,000 per year, as we make so many million, or at least 50 cents per thousand." The first man's estimate was sustained at once, as the difference established to my satisfaction the cost by the old way, and the gentleman who gave me 27 cents as the cost, was credited with being an honest man.

—How It Is Done—

"How is such a saving effected to the extent named?" one would ask who had not given the matter some consideration. In the first place, the cargo of wood is sold along side the dock; the crew loads the barrows and the men of the yard or men who work along the shore wheel it off and put it under the shed at so much a load. With coal that expense is entirely abolished, not to say anything about the wood which walks away during the night. On an average it takes about seven days to burn a kiln with wood, which would require three and one-half days overtime, or, I may say, night time, as each man makes half a night. With coal from four to four and a half days is the length of time required to burn a kiln, or about two days saving. There is no expense of shifting of the wood, and there are other expenses cut, which all tend to help reduce the cost. Well, some one says, "There is the cost of removing the ashes and taking out the rests and bars." True, but just the same with wood, with the difference in favor of coal. With wood the ashes and arch brick may be thrown back on the kiln ground till a more convenient time to remove them. With coal the ashes and clinkers are taken up as they go along, and are not in the wheelers' or anybody's way, so that "cuts no ice" in the expense account. The coal can be delivered at the kiln by the dealer, if purchased that way, or on the dock, if brought by the cargo, and distributed on each side of kiln by cart or barrow, and a man will wheel more coal than wood, as he does not need to handle it but once. With wood it means to load and unload by the stick. It is a well-known fact that if a man is sent with a horse and cart to draw wood around kiln he does not draw any great amount in a day, and if he goes outside the shed the amount is very small.

—Still Further Proof—

To verify, if possible, that there is no exaggeration in regard to cost, I asked the question of one of the best equipped men in the trade and connected with two yards—the one they burn coal altogether and on the other wood. When his attention was called to the fact he replied that the change was near at hand, but not this year. To the question, "Is there enough difference in cost to make it an object to burn coal?" "Yes, a great saving, in fact, wood is not in it." He was asked, "What will it cost per thousand with coal?" "About 30 cents per thousand as an average, quality of coal making some difference," was the reply. "Then you think coal has come to stay?" "Beyond a doubt; there are better results in every way, and, as I look over the field, it seems to me that we have been behind the age, and will have to try in the future to keep up with the rest of the fraternity in other sections of the country." I was satisfied that the cost of burning was reduced to a low figure, and that the days of burning with wood were numbered.

—Haverstraw—

In the past has lead in the advance of brickmaking, and as a result the other Hudson river yards have followed. In the present case they must follow of necessity. Why? Simply because if brick can be burned with coal at a cost of 30 cents per thousand, the man who sticks to the wood on a low market (and that is sure to come some time during the season for a period at least) will be left and lose money on shipment, while the coal burner can make both ends meet and have money. It will cost at least 80 cents per thousand with wood and 30 cents with coal. There is a margin which will help the man materially, providing his brick burn out as well, and there is no excuse for them not doing so, as the coal burned brick now standing under the sheds at Haverstraw show that all it wants is the chance to burn them, and he will burn them well. It will not take as long for the foreman of to-day to produce a clean brick with coal as it did the foreman of days past to reach the high result to be seen on all yards where common brick are made. I do not mean the men of Haverstraw alone, but, go where you will, the same result is found along the Hudson, Hackensack or Raritan rivers.

I am informed that one of the up-river manufacturers put up a kiln, part wood, and six or seven arches for coal, on one end, and, after it was all ready to burn, his courage failed. It is over a week since the information came to me. Possibly by this time his courage has returned and he has produced something, though he made a mistake by putting the two kilns together.

—The Market—

Takes all that comes on, and should show a far better return, on the principle that the trade consumes or takes off the market 70 or 80 barges each week, practically leaving it bare. If such conditions prevail it would certainly appear that it would only be a question of asking more money for stock, and it would be given, as they must have it. When an advance is not asked for, or the manufacturer tells the agent to sell low to help the buyer out, as his sympathy runs to him, as he knows what it is to pinched, I will not venture an opinion. Surely there is no cause to see a market, the best in years, keep dropping, and, with continued good weather, must be kept full, as the shed will be full and room must be had, and ship is the only resource.

Haverstraw	$5.00	and	$5.12½.
Newburg Bay	5.00	and	5.12½.
Up rivers	4.75	and	5.00.
Hackensack	4.75	and	5.00.

Written for the CLAY-WORKER.

CAPITAL NEWS.

A Great Brick Building That is to Be.

IN MY RECENT skips around the capital city, looking for new cogs in the wheel of municipal progress, I noticed that the work of getting the ground ready for the foundation for the addition to the Government Printing Office is well under way. Being sure that an account of this to be great brick structure—which will be in many respects different from any other building in the world—would be of interest to the readers of The Clay-Worker, I called on Colonel Sewall, the army officer who has direction of this important building enterprise, for facts and figures. These were readily given by the genial colonel, who, unlike some gentleman of the army with whom newspaper men have business, is always willing to help the scribe in the matter of news, whenever possible.

It will be remembered that during the last session of Congress $2,000,000 were appropriated for the building mentioned, but perhaps it is not generally known that only about $350,000 were made available for the work, the balance being left to future congressional allotment. It is possible that the structure, when completed, will have cost about $2,300,000. Now, with this enormous sum of money it seems that a building large enough for almost anything could be built, yet with it there will be the present printing establishment, within the walls of which is the most complete printing outfit in the world. And it is a very big structure, being four stories high, fronting 175 feet on North Capitol street and running back 384 feet on H street. It has long been considered unsafe; is not fireproof, and carries an enormous weight in machinery and other heavy material. Scores of printing presses (now made to run easier by directly connected electric motors) shake the old walls, and the vibration is added to by stamping, stitching, binding, ruling and other machines; and with the dead weight on the floors is that of the employes, numbering over 3,000.

Within these walls of painted brick the population of a good-sized town work every week day, each man and woman having in some way to do with material from official "think shops." And what an amount of the product of gray matter comes to this place of cold type—and "hot type!"—the latter, of course, from cast metal. An idea of the work accomplished may be got from the fact that the expense of running the Government Printing Office one year amounts to about $5,000,000. The wages alone, for year ending June, 1898, amounted to something over $2,489,000.

The most costly departmental work printed here is the Annual Report of the Agricultural Department, which bulky volume cost the government in 1898 $282,573.36.

Tons and tons of other printed matter are continually pouring from the great government printing house, and the output is steadily increasing in volume. So a new building is a necessity for furnishing more working space, as well as for safety to the toilers. Our new territorial possessions—Hawaii, Porto Rico and the Philippines—have made additional work for the Printing Office, that for Porto Rico being printed in both English and Spanish. It is possible that when the new structure is finished the greater part, if not all, of the machinery now in use will be moved there. The old building will be improved in various ways; the height will be raised to seven stories—to correspond to the addition—it will be made fireproof; in fact, be modernized as it should be—if Congress is willing to spend the necessary cash for the purpose. And when all this is accomplished Uncle Sam's publishing house will extend from H to G streets, along North Capitol street, a distance of 350 feet; its north side (on H street) 384 feet, and south side (on G street) 480 feet.

But, of course, all the space within these lines will not be covered. The new structure is to consist of a main portion fronting 175 feet on North Capitol street, and from this will extend two wings, each 68 by 276 feet in dimension, one extending along G street, the other along Jackson's alley. This should leave an open space between the wings nearly 40 feet wide by over 200 long. As mentioned above, the building is to be seven stories high—about 175 feet from curb to cornice—and (good news for the brickmaker) will require something like 10,000,000 brick for its construction. The far greater proportion of these will be red brick, employed mainly for outer walls, but about 1,500,000 buff brick are to be used for walls around the inner courts and for lining for work rooms and air shafts.

The latter will have around the lower part of their walls a strip 7 feet high made of enamel brick, and above this the buff brick will extend to the ceiling. The building will not contain any kind of plaster, the nearest approach to this being concrete, of which 12,000 cubic yards, for basements, courts, etc., are to be used. Colonel Sewall said, in answer to a statement from me, that the enameled brick in the new Congressional Library were imported from England, at a cost of about $100 per thousand; that brick of this kind for use in the new Printing Office would be purchased in this country, and that a very excellent enameled brick could be bought here for $85 per thousand. Of course, he did not say that this amount would be paid for the brick; such matters are left to bidders.

The employment of costly brick for walls of work rooms in large factories is a good step forward in hygienic progress and in personal safety. With cleanliness in the new building will be comfort in light and air from between 1,100 and 1,200 windows, with additional ventilation from a fine exhaust system; and in winter heat will come from direct-indirect steam. The present method of furnishing water to the great number of workers in the Printing Office (by small coolers) is to be supplanted by a refrigerating plant, from which the cooled water will be taken in pipes all over the building, being tapped at certain convenient places.

In the matter of safety, the new structure will be made as nearly fireproof as possible. The largest item of wood in its construction is the 350,000 square feet of maple flooring. To this can be added 112,000 square feet of granolithic or asphalt flooring. The whole floor space will be more than nine acres in extent. Up through the six floors will run four main stairways, ten airshafts and twelve electric elevators. The amount of steel to be used in constructing this mammoth printing office is 6,000 tons.

* * *

Hearing that Uncle Sam was doing something for the old soldiers at the Soldiers' Home near Washington, your correspondent went there to get some information concerning the matter in question—building affairs. For quite a long time improvements have been needed at the home, and since the Spanish-American war the necessity for more room for the lately incapacitated soldiers has become much greater.

And so the brickmaker has been called upon for large quantities of his material, which is now being put into architectural shape. This consists in changes in and additions to a number of the buildings, at an expenditure of about $100,000. Thirty thousand dollars will be spent upon the King building, to which are being added two wings, each 50 by 50 feet and four stories high, and an additional story to the main building. The walls are of red brick, with Hummelstown stone trimming. When completed this building will be one of the best of its kind in the country and will contain more conveniences for the retired soldier than usually falls to his lot. He will here have porcelain bathtubs, marble basins, best plumbing arrangements of all kinds, and an hydraulic elevator to allow him to dispense with tiresome stair-climbing. The improvements in this building will make room for 120 extra beds.

The hospital building, of so much importance to a soldiers' home, will have $50,000 spent on it, principally for a large dining room, the present space occupied for this purpose being so inadequate to the demand that only about one-third of the occupants of the hospital can be seated at a time. Arrangements are to be made here for fifty new beds. Red brick are being used in this work and also for additions to the home power house, where heat and light are furnished.

To get a good idea of the Soldiers' Home in the District of Columbia requires a visit there and time to wander through its beautiful rolling grounds, which stretch away in hundreds of acres (between 600 and 700), covered with numerous varieties of trees, through the splendid foliage of which, as the broad, smooth walks and drives are traversed, comes glimpses of charming architectural piles in white stone and brick, where the old soldier (now more than 800 of them at the Washington home) finds a haven of rest and comfort.

Considerable other government work in the District is being pushed along, among this being that connected with the Department of Justice. The old building, in which was located the attorney general's office, has just been pulled down to make room for the new structure. This will front Pennsylvania avenue opposite the treasury, having its western side near Lafayette square, the most charming park in the city.

The general building business here is still detrimentally influenced by high prices for material, the increase of the cost of building a house being from 40 to 50 per cent. over that of last year. But, notwithstanding this fact, operations in this line have, up to date, been more extensive than in 1898; in fact, there is much over a million dollars difference in this respect in favor of the present year. The high price of material effects particularly the builder of small houses for sale and rent, and the man of small means, who desires to build his own dwelling. The rich—and the government—can be independent in these and many other matters.

NICODEMUS.

AMERICAN IMPORTS AND EXPORTS OF BRICK AND CLAY.

By Associated Trade and Industrial Press.

The following exports and imports of bricks and clay are just completed for the month of July, the latest period for which the official figures have been compiled by the Treasury Department:

Building brick was exported in July to the amount of 628,000, valued at $4,356, against 196,000 exported in July, 1898, valued at $1,400. During the seven months ending with July, 1899, the exports amounted to 5,265,000, valued at $40,412, as compared with 2,245,000 exported during the corresponding period of the preceding year, valued at $16,030.

Fire brick was exported to the value of $15,987 in July, 1899, against $11,914 in July, 1898. The total for the seven months were valued at $110,534, in 1899, as compared with $77,781, the value of the exports during the corresponding period of the previous year.

The dutiable imports of clay for the month of July, 1899, amounted to 10,864 tons, valued at $72,979, against 10,012 tons, valued at $69,344 during July, 1898. The seven months' total imports amounted to 70,878 tons, valued at $473,251, as compared with 66,549 tons imported during the seven months of last year, valued at $462,593

MILLIONS IN DRAIN TILE.

ON THE FIRST MAPS of Indiana, published by George Mellish in 1817, all of the central and northern section of the State which now forms the garden spot of the Mississippi valley is marked "Wet Prairies." In an official government report filed by Jehu Smith, a government surveyor, in 1835, he officially locates—in this great agricultural section of to-day—"hell, the abode of Charon, the river Styx and the Stygian pool," and laments the fate of any man set down in the "slough of despond" without compass, grog or tobacco. When the pioneers came to Indiana they settled in the hills and upon what are now the poorest lands of the State, because all of that broad expanse north of the foothills which line the Ohio was ruled by swamps, ague and malaria, most of it being one great bog in all but the summer season. That it is what it is to-day is attributable to artificial drainage, which has turned the water into three or four great channels, has converted the morasses into tillable land upon which the best crops in the State are raised. Ague has disappeared, and the death-dealer—malaria—has gradually been dispelled.

The greatest development of this section dates from 1850. Since 1870 $35,000,000 of drain tile have been put underground in Indiana, and almost an equal amount has been expended in putting it there. It is probable that even the railroads, which interlace the State, have not played as great a part in its development as has drain tile. Indiana was the second State to take up tiling, and, per acre, more has been put down in Indiana than in any other State in the Union. To-day she stands second in this industry, and here at Summitville is located the largest drain-tile plant in the world.

—Reclaimed by Drainage.—

The most perfectly drained farm in the world is the old Jon Johnson estate of 400 acres, near Geneva, N. Y. Jon Johnson was a Scotchman, though his name would probably indicate Swedish descent. He came to this country early in the '30s and took up the 400 acres of land. He found it too damp to till, and he was unable to make any headway. Instead of giving it up to creditors, however, he managed to get hold of more money and he went back to England and investigated tilemaking, which had just been invented in the peat land districts of that country. He brought home with him the first tile ever put under the ground in this country, and the next year erected the first tilemaking establishment. He turned the tile out by means of a wooden press. The clay was rolled out like a pie, then turned over a horseshoe-shaped aflair and allowed to dry. The tile had no bottom. For the wooden press the motive power was secured by means of a cleaver leverage on a tree. Later he evolved the idea of iron dies. The first plant in Indiana was erected through the influence of I. D. G. Nelson's articles in the Geneva Farmer. It was erected by Nelson and others at a point in Allen county, near Ft. Wayne, in 1846. For several years the growth of the industry was very slow. The farmers could not see how they could get returns by putting expensive tiles under the ground. It might also be added that there are still a great many in certain sections of the State who look upon tiling as a waste of money. The primitive ideas of the people are strikingly illustrated in that they always left open the under side, or the bottom of the horseshoe, so the water might get in. The tile were laid on a foundation of wood. Little by little the farmers began to take an interest and finally to experiment. Small tile plants sprang up here and there, supplying township demands. The tile was very expensive—three-inch selling for 35 cents to 50 cents a rod. When some reckless genius insisted that the tile would be better and more serviceable if they had a bottom instead of being laid upon wood, there was a great discussion. They gathered more water than did the old ones. This was a great step in evolution, which in time no doubt will be followed by tile being made of as dense material as glass. Up to 1880 all plants were run by hand power. Another inventive genius conceived the idea of applying steam.

—An Early Plant.—

One of the earliest plants in the State to make this break was the one at Summitville and another at Fowler, Ind. Since then the development has been wonderful. Tile has been placed within the reach of all farmers at a price where they can now perfectly drain ground at a cost of from $5 to $6 an acre. Three-inch tile which sold for 35 to 50 cents—and very poor ones at that—are now turned out for as low as 13 cents on good-sized orders. The two-inch tile has entirely disappeared, and the farmer can now get seven-inch tile at about the same outlay he formerly had to make for three-inch. Machines have been invented which dig the ditch, lay the tile and cover it at a cost ranging as low as 20 cents a rod. Tilemaking and drainage has passed the experimental stage, and is now based on scientific and business principles. Engineers run the lines, figure the fall, the tile are turned out by men who make it a life study and are constantly improving upon their products. Farmers put them under the ground, knowing that they will reap tenfold results. Instead of using small tile they are gradually taking up the larger ones, and more tile over ten inches is now being used than sizes under that diameter. The scope is widening year by year, and, instead of limiting the use of tile to draining farm lands, it is now being used in road and building construction. The remarkable widening of scope during the last few years leads to the belief that time will evolve some wonderful ideas in the use of drain tile which are now not so much as dreamed of.

—Evolutions in Tilemaking.—

The Summitville tile plants are remarkable for many reasons. In these plants, during the last ten years, very nearly all of the evolutions in tilemaking have had their beginning. This company turns out one-fourth of all the tile manufactured in the State, though there are in all, large and small, almost 200 plants in Indiana. The plant at this point is not only the largest in the world, but it does not have a very close second. The next largest in the United States is located at Bloomington, Ill., the next to that being at Delaware, O. Two or three foreign plants, however, have to be considered in selecting the second largest plant of this kind in the world.

Tilemaking is now passing through that stage which will separate it from being an adjunct to farm work. In the past most plants have been operated by farmers in connection with their farms. Farmhand wages have been paid, ranging from $20 to $25 a month, and any muscular man was thought to be good enough to do the work. The few men who have placed the manufacture upon a business basis, and pay by the piece, require skilled workers, who make from $1.75 to $2.25 a day. The output runs as high as 20,000 feet (almost four miles) of four-inch tile a day.

There are less than a dozen plants in Indiana which do anything more than fill the orders of their local community. They are the Summitville plants and concerns located at Windfall, Curtisville, Herbst, Orestes, Galveston, Kempton, Decatur, Akron, Daleville and Shipley.

—Ohio Ranks First.—

Ohio takes first rank as a tile manufacturing State, Indiana comes second and then Illinois, Iowa and Michigan. There are in all about 800 plants—big and small—in the nation, though only about twenty-five cater to open markets. It is estimated that about $8,000,000 worth of tile is put under the ground in the United States every year. The effect of this outlay of money is reflected in the improved crop returns. Indiana, for instance, is now approaching a stage of tiled perfection, when she is certain of a crop whether it is an extra wet or a very dry season. Land which formerly was not reliable for an eight-bushel yield of wheat now produces as high as thirty-five bushels, and the Jon Johnson farm land, which has been drained since 1836, produces wheat that ranges as high as forty-five bushels, and averages that almost every season. Tiling loosens the soil, permits the air to penetrate, and brings the sunbeam effects right to the roots of the plant. The ground being made porous, the roots sink deeper and give the plant a better lease on life. A porous soil, sunshine and air and water are the four things which make vegetable life. To secure the proper proportion of each is the study of the tile manufacturer and the drainer.

But for drain tile Hendricks, Boone, Clinton, Tipton, Marion, Hamilton and scores of other of the best counties of the State would to-day be drowned in wet seasons and baked in dry ones. Drainage advances the season and lengthens it by permitting the farmers to get to plowing a week or ten days sooner, and by making a hardier plant the frost effects of early fall are not noticeable to the great extent that is found in untiled regions. The discoveries which have been made leading to more effectual drainage, by new styled "leads" and different placing of the tile, are constantly being changed and bettered by the men who are making this great branch of internal improvement the study of their life.—E. J. Lewis, in Indianapolis News.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Up vs. Down-draft Kilns.

Editor Clay-Worker.

I have read the article by L. C. M., "A Brick Factory in a Wooden Town," with much interest. In fact, I have considered them as one of your stellar attractions, but I must take a little exception to part of No. 15. The passage "There will still be those who will use the up-draft kiln, because they are so much more cheaply constructed and require so little repair," is followed by a description of the up-draft kiln in mind. As I understand it, the cheap construction of an undraft kiln, as against the down-draft, lies in the not requiring either crown, heavy walls, chimneys or expensive bracing. As described by L. C. M., the difference between the two is so slight as to cut "no figure." I expect L. C. M. has in mind the old-fashioned honey-combed floors of our ancestors, styled riddle bottoms, and which were a mass of flues and counter flues. These were certainly expensive affairs which experience and progressiveness have pushed to the wall, giving us a floor with the minimum of flues and the maximum of dead space. In fact, some seem to fill the bill without flues at all. This leaves only the flash wall as the difference between the L. C. M. up-draft and the ordinary down-draft.

I have burned up-draft kilns with and without crowns, and for many reasons prefer the latter. Putting on a crown restricts the width of kiln to an uneconomical size, 16 feet is entirely too narrow. Even with crown I prefer them 20 feet wide, and without crown I would build them 28 to 30 feet, depending some on the material to be burned. The number of furnaces is, of course, governed by the length of kiln, and the number of firemen by the number of furnaces, the width coming in with the capacity per furnace. In the matter of cheapness of construction and full consumption the open top up-draft kiln is ahead of the down-draft when figured on a common brick basis, but for uniformity of color and hardness the down-draft—as built to-day—has no superior, and I am convinced that, with the same clay and coat, the latter will produce a richer color, buff or red, than will the up-draft; but it will cost a little more to do it for several reasons. There are many points in No. 15 that are valuable and timely, and this criticism is written with the sole object of "an effort to determine what is best."

PRESS.

The Chicago Building Situation.

Editor Clay-Worker:

In the words of the "journalist," the past month in Chicago has been "fraught with interest." The triangle misunderstanding between the Master Masons, Bricklayers' Union and Material men has overshadowed all chance for a prosperous summer such as was prophesied early in the season, and with good reason, as attested by the amount of work "held up" at the present time. In the meantime, the summer waneth, and old Boreas (and a Chicago Boreas is not to be sneezed at) will soon remind the laboring man that the dollars wasted this season in strikes would fill a long-felt want where the coal bin is concerned.

With labor unions adding to its ranks to such an extent that 24,000 participate in their annual turnout in this city alone, it is no wonder that capital endeavors to follow in the footsteps of labor, and when it does it is labeled a "trust." Since the days of the original promoter, Noah, who successfully "floated" what our modern advance agent would call the most stupendous aggregation of the animal world, to the present time, the tendency towards combines has kept pace with the other features of civilization.

We fret and chafe over a few month's delay, but "in the wash" we find that we are progressing, and as a city we can take our place fourth in the list, and in our admiration of our growth, and satisfaction in hearing our praises sung by our admiring contemporaries, the miseries of several thousand workmen and their families are forgotten, and they are left to the tender mercies of the county agent for the winter, and next season the experience will be repeated.

The prospects for a successful fall trade in all lines of building construction do not suggest overwork to any extent. Anent unions, our Chicago leaders resent the statement of John Burns, member of Parliament and English labor agitator, as to American workmen being "slow" and "behind England," and he will, no doubt, get a "hot one from the Chicago federation. Mr. Burns should be one of the fall festival committee, if he considers our unions "slow."

As for an example of astuteness the local press accounts of the architectural jury, who passed through Chicago the 25th ult. en route to the Pacific coast, and inspected the city from the rear of their car, takes the cake. The reporters, with infinite sangfroid, say, "But they were clever men, and claim they were able, with the aid of field glasses, to gain a very satisfactory idea of the city." All this happened while they were being switched from the M. C. yards to the Northwestern, and the reporters were probably giving their attention to glasses other than "field."

How Chicago looked to the Visiting Architects.

As an offset to business cares Sept. 1 offered recreation to a number of The Clay-Worker's friends, and the past week has witnessed a general cleaning up of shotguns, flasks and other paraphernalia of the chase (I use the term "chase" advisedly, as one of the recreators told me confidentially that he chased over a forty-acre field, with the thermometer at 115, and never started a feather), and for the nonce bills payable and brick deliveries were supplanted by the blithesome whir of the prairie chicken and mud hen. H. C. Hayt, C. B. VerNooy, S. S. Kimbell and a number of others are wearing terra cotta shade noses, clearly the result of exposure to the free air and sunshine on the stubble fields. From the experience of Mr. VerNooy, Markham's "Man with a Hoe" isn't in it with the husky farmer with a club, when the farmyard "biddy" is in danger. Our Builders' Club, in their commodious quarters in the Chamber of Commerce building, will, as usual, do themselves proud in looking after the visiting brethren during the festival week. The visiting brethren, in the meantime, had better practice up in pin pool. A word to the wise is sufficient.

VERITAS.

Chicago, Sept. 6, 1899.

Brick and Building Interests in the Cream City.

Editor Clay-Worker:

In spite of the high price of materials, there is a large amount of building in Milwaukee at the present time, and the brick business is consequently flourishing. Having a monopoly of the entire field, the recently formed "trust" is able to fix the price to suit itself, and even this does not seem to have discouraged building to an appreciable degree.

Still, it must be said, in justice to the so-called trust, that it does not appear to have abused its opportunity. Some years ago, before the local yards began to engage in the suicidal game of cutting each other's throats, the price of common brick was $8, with the other grades in proportion. It didn't take the cut-throat war long to reduce the price to $3.50. It was a grave time for the local brick men, who were given the chance of realizing how it feels to lose money while being doubly industrious. When in the early days of the present year the trust was formed, in other words, the Milwaukee Building Supply Company, the members thereof were in a position to raise the prices to the highest possible figures, and nothing could have stopped them. This they did not do, however. The price of common brick was fixed at $7, one dollar less than it was sold for on the former occasion referred to. Sewer brick sold at $8 and select at $10. Quite recently another raise in price has been made, necessitated by the advance in the price of coal and wood and also the higher price at which labor now sells. An advance of fifty cents a thousand was accordingly made on the three grades respectively. The advance took place on June 15.

There are, ostensibly, two brick companies in the city, the Lincoln-avenue Brick Company, which operates the old Chase yards on Lincoln avenue, and the Milwaukee Building Supply Company. The first is, in fact, but a wheel within a wheel, and is in no sense a competitor of the trust. On the contrary, it is a part of it, its officers and stockholders being almost identical with those of the general company. The Lincoln-avenue is one of the best properties in the city and is being run to its full capacity. When the trust was formed it leased every yard in the city. It was thus in a position to suit the supply to the demand, and to operate with a minimum of waste effort. The saving in this one item must be large. At present five yards are being operated. The Lincoln-avenue yard, the Howell-avenue yard, the West yard, the Milwaukee Brick Company yard, and the yard of the Charles Kraatz estate, which is just outside the city on the Watertown plank road. These yards, run at their full capacity, are ample to furnish the present demand for brick. If the demand falls off some of them will be closed; if it increases, others will be added to the list of active yards. Of these latter, which are four in number, the most available is the old Burnham yard in the Menmonie valley. The other three are the Standard Brick Company yard, the Cream City Brick Company yard and the Davalaar yard. Those that are being operated at present have been chosen from considerations of capacity rather than from that of the quality of the clay.

The present officers of the Milwaukee Building Supply Company are: C. T. Burnham, president; John Q. Burnham, vice president; Ferdinand Vogt, secretary, and Henry Herman, treasurer. The company has its offices in the Pabst building.

When the Lincoln-avenue yard was run independently it had an output of considerably over 125,000, and did the largest business of any yard in the State.

An advance of 10 per cent. in the wages of the brickyard workmen has just been announced, an advance which will affect about 500 men. Treasurer Herman said yesterday that the advance was made because of the general advance in wages granted elsewhere in all lines of work. This is the second advance that has been given the men this year, the former one being also one of 10 per cent. It took place several months ago. The men will now get $1.50 to $2 a day, which is the highest paid in many years. A few years ago a prolonged strike at one of the South Side yards was the result of a demand for an increase to $1.35 and $1.40 a day, it being claimed by the men that they had been reduced as low as $1 a day. On an average labor in Milwaukee is receiving $1.65 a day for excavating and work of that sort, while the work on the railways is paid at the rate of $2 a day. Under these circumstances the brickmakers thought an increase advisable. Mr. Herman claims that there will be no further advance in the price of brick as a result of the higher rate of wages granted the men.

Milwaukee, Sept. 12, 1899.

From Maine Mud Yards.

Editor Clay-Worker.

The month of September sees the end of the brickmaking season in Maine. By the 25th inst. scarcely a yard will be striking, but it will be well along in October before the burning is finished, and this year it will be well along toward spring before the last man quits work; for the entire output of the Maine yards is engaged and spring will find us without a brick to begin on.

It is yet too soon to estimate the output of all the yards, but that it exceeds the output of any year for a score or more years is conceded. The last year's record is more than trebled, and yet there are not bricks enough. It was an ideal brickmaking season, excepting in the Aroostook county, where it rained incessantly throughout July. Daniel Mullen's crew at Ashland got but seven days' striking in five weeks during the last of June and in July.

In the central and southern Maine yards there was not a day lost on account of weather, rather a phenomenal record. Through all this sunshine and prosperity the painful truth comes home, with added emphasis, that the Maine brickmaker is more or less of a goat, butting his head against a rock pile most of the time and chewing his cud and wondering what it means when he finds an open gate.

The fact makes itself felt more and more, according as prosperity beams, that the great need of the Maine brickmakers is a mutual combination and understanding. The last vestige of the old days of barbarism, when the industry was new and year after year brought a steadily increasing demand, and half-trained strikers jumped into the manufacturing of brick on their own hooks, and it was crowd and push and cut and thrust and gouge and elbow right and left, still lingers. Brickmaker seems set against brickmaker in fair or stormy weather, and jealousy, distrust and animosity pervades the entire lot, whether in times of panic or in the time of richest harvest.

The lesson, or the fruits of this animosity, is found in the history of this season in Maine. With a fair understanding with each other last spring, when contracts were being made, no power under Providence could have hindered every brick sold taking $8.50 per thousand. What has happened? Simply the old story of the days gone by—a dozen sellers after every buyer and an inverse auction held upon all the bricks sold. Men who had made contracts for all they could manufacture, still, like the dog in the manger, crowded in that their fellows might be crowded out. The result is known now. Some makers have sold for as high as $7.50 per thousand, and, shame to them and to all, more have sold for less than $6. Would such be the story had these men used the brains God gave them and formed a combination in the spring, with an intelligent working head to plan and place and review and call them together and show and explain where and how they should expend their energies? But this is an old story. It has been talked at intervals for thirty years. Sometimes it came near fruition, this plan of a friendly union, and again it faded away before one act of treachery—treachery engendered by that old barbaric jealousy of the early days.

The season has been a good one. Next season may be just as good. But, good or bad, will the Maine brickmakers continue to go on like the goat, butting their heads against closed walls and finding themselves dazed at the sight of a clear passage through?

It is good news that that model of brickmaking plants at Columbus Falls is to be operated again, and this time by men who will surely turn its mine of wealth into use. The head of the project is our old friend, George M. Fiske, of Boston, and, with Parry and Candage and Cushman to bear a hand, you may look for some great work in the little long arm of the sea, where we "pry up the sun mornings with a crowbar."

The big mill at Milnokel, the Great Northern Paper Company's enterprise, is not above the foundation yet. It will be some time before brick are laid. However, the wilderness has given way to a lively town, and a city will follow soon, they say, up in sight of old Mount Katahdin's ragged sides.

B. J. DUNN.

Down-Draft Kiln Furnaces.

Editor of Clay-Worker.

In your August issue we find a communication from Geo. S. Tiffany under the caption "Arcs of Kiln Crowns," in which he very kindly and considerately expresses himself as differing with the writer in his views of the "Value of Metal Covers for the Coal Holes of Inclined Grate Furnaces," as set forth in my contribution to your July issue.

I congratulate the clayworking fraternity upon this brief contribution of Mr. Tiffany to kiln literature, for nowhere have I found in print such a lucid and perfect description in words, few or many, of the action of this class of furnaces when under full fire as may be found in the third paragraph of his paper.

The reader will please notice, however, that Mr. Tiffany qualifies his statement by introducing the words, "When the kiln is at high heat," and we are glad to admit the truth of all he has said as it applies to this stage of the burn. Because a metal hole cover is provided is no reason why it should be used save as occasion may require it, and its use would not be required under such conditions as are named by Mr. Tiffany.

Notice in our article alluded to, the cover is made to do duty in case of adverse winds and especially in the early stages of the burn, when the furnace is but partially filled and the throat of the furnace is all open to the admission of air.

It is obvious that when "the kiln is at high heat" the coat will have been made to fill the furnace and the cover will serve no good but an evil purpose. Let it be understood, then, that the covers suggested are only to be called into service to correct what we have set forth as the defects of this class of furnace at certain stages of the burn.

We have before now apologized to your readers for advancing theories—we have been careful, however, to present a basis of reason for any views advanced. We had hoped for and invited criticism in the interest of the truth, and shall be glad to have any fallacies or anything misleading in our suggestions exposed, especially if done with such a kindly spirit and with such discriminating intelligence as that shown by Mr. Tiffany. Our seventh kiln article, which will appear in the current issue, will furnish new opportunity for criticism, and we hope it may be improved by thoughtful men.

FLAME.

Busy Times in Pennsylvania.

Editor Clay-Worker.

Please find inclosed $2 for renewal of our subscription, as we could not get along without The Clay-Worker. We are making lots of brick this year and find ready sale for all we can manufacture. The prospects were never better. We have disposed of upwards of 12,000,000 already and find shipments so far ahead of any other year. Shortage of cars has delayed us somewhat, but we hope to make this year a record-breaker, as we have orders on hand for 10,000,000 more.

J. M. RUMBAUGH BRICK CO.

Treasurer Sibley Goes a Fishing.

IT WAS OUR GOOD FORTUNE to have at our summer home recently Mr. and Mrs. John and Miss Hettie Sibley, of Coaldale, Ala. "Master" John's stay was short, owing to the pressure of business, but he stayed long enough to sample the fishing of Pine Lake, and, as proof of any fish stories he may relate, we present a snap shot of a morning's catch. He reports all industrial interests of the South very active. Birmingham is having another boom, one of the incidents of which will be the improvement of her principal streets. Brick will play an important part in the work. Many other Southern cities are doing the same, so the demand for pavers is fully up to the capacity of the Southern plants. All of them are prospering, and, in addition to the demand for street paving, there is a large and growing demand for vitrified brick for sewers, etc. Prospects for trade expansion are very good, Treasurer Sibley thinks. However, he is somewhat of an expansionist on general principles, and is not the least bit worried over Uncle Sam's venturing away from home, but is of the opinion that good will result both to the Filipinos and ourselves as a people. Being a born and bred Southerner he glories in the part taken by Fighting Joe Wheeler and other Southerners in the war with Spain. The fraternizing of the boys in blue of the South and North is, he thinks, of itself a recompense for much of the loss sustained in that contest. Those who are fretting over the possible dangers of imperialism would do well to follow "Master" John's example, and go a fishing, if only for a few days. A little rest will make them less apprehensive, nervous and fretful.

Jno W. Sibley, Treasurer N. B. M. A., and daughter Hettie with a Morning's Catch.

The Clays of Michigan.

The State Geologist of Michigan is having Dr. Heinrich Ries, of Cornell University, investigate the clay and shale deposits of that State, many of which, especially those of the coal measures, are very promising.

Samples are being collected from many localities, and these will be subjected to physical tests and chemical analysis.

It is hoped that the issuance of the report in the near future will serve to direct attention to he fact that Michigan possesses other mineral products of value besides copper and iron ores.

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CURRENT COMMENT.

August is always a large month for brickmakers. The past month was a record-breaker here in the middle West. One Chicago firm delivered 3,430,000 building brick in the first six days following the strike in the Windy City.

* * *

All the leading paving brick manufacturers are extremely busy. The Purington Paving Brick Co., Galesburg, delivered during the month 8,320,000 pavers. Their largest single day's shipment was 430,000. All the other manufacturers are doing a proportionately large business. This of itself tells of the growing popularity of brick streets.

* * *

Without being hypercritical, there is one little remark made by Mr. Middleton, in his report of the clayworking industries, that we take exception to. He speaks of brick paving material being particularly adapted to small cities. Certainly the experience in this city and elsewhere justifies the statement that there is no material which will stand the wear and tear of heavy travel like a brick pavement properly laid.

* * *

The event of the month is the opening of the National Export Exposition at Philadelphia, Pa., which occurred the 14th, President McKinley at the White House touching the button which set the wheels going, as is customary in affairs of national importance. The show is immense, though many of the exhibits are still incomplete, and will prove of great benefit to American manufacturers of exportable goods. We will tell our readers all about it later on.

* * *

The School for Clayworkers, which is a part of the Ohio State University, at Columbus, began its fifth year Sept. 11 with a good class and improved facilities. The success of the ceramic department—the good accomplished in former years—has enlisted the cordial support of the university faculty, and they are giving Prof. Orton every assistance possible that the efficiency of the school may be maintained. As it is now equipped and managed, the school affords our clayworkers that-are-to-be the very best means of obtaining a technical yet practical education.

* * *

Those of our readers who understand and appreciate the importance of the clayworking industries know that no other industry is pregnant with greater possibilities. Every branch of the clay business must inevitably increase in volume and value as surely as the world moves on to a higher civilization, which demands better and safer homes and surroundings for the entire human family—rich and poor alike. For these reasons brickmakers may well encourage their sons to follow in their footsteps. They should see to it, though, that the boys are better educated and equipped, that they may avoid the pitfalls and troubles that have been a part of their own experience, due largely to a lack of technical knowledge. The best means to this end is a course in Prof. Orton's School for Clayworkers.

CLAYWORKING STATISTICS.

In other columns we have given a resume of the "Clayworking Statistics of the United States," by Mr. Middleton. This work bears on its face evidence of having been carefully and thoroughly done. We may speculate from year to year as to the growth or development of clayworking industries, but after all is said and done, we must wait for the work of the conscientious statistician for direct evidence. This report is not alone valuable for what it shows as to the conditions in 1898, but is particularly valuable for what it shows relatively. In taking account of our business from time to time, it is not so much what we do this month or this year, as the relation this period bears to some corresponding period in the past. It is not so important what we did this July or August as it is to know its relation to the July or August of last year. None of us like to stand still. While we are affected by times of depression, and while there must be times when our business does not grow, yet the only way in which we can be sure of development is by comparison. The brickmaking industry, although subject to fluctuations of general trade, has, when we look at it from decade to decade, made great advancement. If we could compare the results from 1880 to 1890 with the results from 1890 to 1900, we could readily see that we are advancing in a great way. As it is, however, the last two or three years have shown material advancement over the years that have passed. Statistics such as Mr. Middleton's are reassuring, indicating that the clayworking world is moving, and we are moving with it.

FIREPROOFING.

We have received advanced sheets from the fireproofing catalogue of the Central Fireproofing Co. of New York. It shows an unusual number of forms and great technical improvement over what has been done in the past. Competition has done this. None of us are disposed to go faster than we have to. It is all well enough to look back ten or fifteen years and say if we had done this or that what an advantage it would mean to us. This may or may not have proved true. It is possible that ten or fifteen years ago the general conditions were not ripe for such improvements—they would not have been appreciated. The public as well as the clayworkers must be educated. We might make an article to-day of such a condition of excellence that the world at large would not realize it or pay for it within the next five or ten years. Clayworkers cannot move faster than the rest of the world. This thing is assured, however, with reference to the matter of fireproofing, that the clay products are superior, and that while they have had to compete with cheaper methods, involving wire, corrugated metal, cement and other products, the architects and high grade of builders all realize that burnt clay fireproofing is really the substantial method and the method which carries the greatest assurance with it. Tests of a very thorough character of the relative merits of cement and burned clay fireproofing have recently been made under the administration of the greatest architects, engineers, builders and scientists of Great Britain, and in every instance the clay products have shown pronounced superiority. The catalogue which we have received shows a very careful study and a thorough appreciation of the needs of the times and we are pleased to commend the material and the skill in its adaptation shown by this company, who work as engineers as well as first-class manufacturers.

GENERAL BUILDING.

The year 1899 has not been phenomenal in the erection of great office buildings and stupendous public structures throughout the country. However, it has been phenomenal in the number of moderate sized structures put up, and, after all, it is structures of this character that make the volume of brick business. A great office structure does not mean the use of, relatively, a large number of bricks. A building has recently been erected in this city 60 feet front, 100 feet deep, 12 stories high, wherein not over a million brick were used. The front is of terra cotta, and the side and back walls brick, the frame steel. On the other hand, many schoolhouses have been built which have used from 250,000 to 500,000 brick; many dwellings have been constructed involving the use of 60,000 to 200,000 bricks. While the one office building makes a large spot in the landscape and adds to the sky line of the city, on the other hand, from the brickmakers' standpoint, it is relatively small in the number of bricks used. It is the moderate sized structure, the stores, schoolhouses, churches, dwellings, stables, foundations to frame buildings, chimneys and like undertakings which, after all, make up the volume of brick used in the country at large. We cannot estimate the general condition of the brick market by the large number of great office buildings or public structures which are in course of construction.

PARIS EXPOSITION.

Following the conviction of Dreyfus there was a feeling of resentment on the part of many of us, and the majority are anxious to punish some one for what we feel to be a manifest injustice. There was talk of boycotting the Paris Exposition. While we do not question that a great injustice was done and that the military spirit of France was responsible for it, yet cool judgment and self-interest must suggest that the Paris Exposition relates not alone to France, but is a part of the world's work. The Exposition at Philadelphia in 1876, in all probability, was more to Germany than to America. The German commissioners went to the Philadelphia Exposition and reported to their government at home that Germany was far behind the rest of the world in manufacturing and that something must be done. It was the Philadelphia Exposition that was instrumental in forming the great trade schools of Germany, which, within a little over twenty years, have elevated that nation from the tail end of the world, commercially, to the head. German cities, since 1876, have increased in population much more rapidly than any of the cities of America, excepting Chicago. We may compare the population of American cities in 1876 with those of similar size in Germany, and then compare them to-day, and we will find, without exception, that the German cities have largely outgrown our American cities. There is no speculation about this; there are facts to sustain the statement. The Paris Exposition may mean, if properly studied and carefully considered, more to America than to France. The fact that the Exposition is held in Paris, and that Paris is in France, is a mere incident; it is an exposition belonging to the world, and has no local or national significance as related to the French people. We must regard the Exposition as international, and not local.

COMBINATIONS.

During dull times, when it is difficult to sell brick, we can argue the question of combination by brickmakers with some spirit, but now that it is easy to sell brick at a fair price there is little advantage in saying anything about combination. The question of competition does not cut a great deal of a figure when the market is wide; on the other hand, it is difficult to restrain prices when business is dull. Some days since we were discussing the question of combinations and trusts with those interested in the manufacture of builders' hardware. A gentleman stated: "The manufacturers of this material are now operating under what is known as a gentleman's agreement." "What does a gentleman's agreement mean?" we asked. "Why," said he, "it means that as long as we can sell all we can make at a good price we are gentlemen, but the minute trade begins to decline we are ready to cut each other's throats. It is easy enough," he said, to live up to the gentleman's agreement as long as there is no reason for being ungentlemanly. As it is, we are selling all we can make and have no trouble to maintain prices and our reputation as gentlemen."

FLOOR TILING.

The manufacturers of floor tiling have had to compete during the last few years with makers of composition floors, known as Venetian mosaic, marble mosaic and other like compositions. It is the general spirit of the American people to be always willing to try a new thing, and also to distrust for a time "any old thing," no matter what its value. These composition floors which we have mentioned have seen their day. We may walk over them; wear shows the cracks, and many of them have gone into a condition of dilapidation within two or three years. We are pleased to note that buildings put up within the past few months are putting in tile floors. One building had specified marble mosaic, composition flooring, to be made up of scraps of marble and cement. Within the time the building was started similar floors in the city began to show a decline, and, wisely enough, a change was made—certainly a change for the better. Floor tiles are now, as we know, made very simply, pasted on paper, with fair sized joints between, and put down in a way to make a very lasting, permanent and beautiful floor covering.

A WELL-PAVED CITY.

Danville, Ill., claims to have more miles of paved streets than any city of its size in the world. For several years the efforts of the different city administrations have been directed toward paving the beautiful thoroughfares of the city with brick. There is not a rod of any other kind of pavement in the city, and there are nearly fifteen miles of smooth brick pavements. The streets are broad, shady, well-curbed and bordered with smooth lawns. The consequence is that there is more driving in Danville than in any other city of its size. Almost every family in the city owns a horse and vehicle of some kind. If they were all assembled these different vehicles would make a striking display. They range from the most rickety one-horse chaise up to automobiles. In the summer there is an almost endless procession of vehicles on each street. The contractors are just beginning a large amount of additional brick paving.

IOWA CLAYS TO BE CAREFULLY TESTED.

Readers of The Clay-Worker will remember that at the winter meeting of the Iowa Brick and Tilemakers' Association, at Sioux City, resolutions were passed urging the advisability of a fuller investigation of the clays of the State. A committee consisting of Messrs. J. H. Charles, of Sioux City; D. W. Townsend, of Cherokee, and J. B. McHose, of Boone, to which has later been added Mr. C. B. Platt, of Van Meter, was appointed to agitate the matter, and, if possible, secure action.

At the Iowa State College of Agriculture and Mechanic Arts, located at Ames, tests of paving brick have been carried on quite extensively, and Prof. Marston and his associates were planning to carry on the work the coming year. At the State University Profs. Sims and McGowan were also planning to take up the work. Representatives of the Engineering Society, Brickmakers' Association, Geological Survey and State University accordingly met with the professors of the engineering department of the college, and a joint commission was organized with Prof. A. Marston, of the State College, as chairman, and H. F. Bain, of the Geological Survey, secretary. The visitors were welcomed by President Beardshear, after which there was a general discussion of subjects and methods and a plan of work was adopted.

It was decided as a first step to make a careful study of paving brick with a view to the preparation of a report on the methods of manufacture, the formulation of a series of tests, the adoption of uniform specifications and the collection of data as to methods of laying pavements, its cost and life. The latter portion of the work was placed in the hands of the sub-committee of engineers, who were requested to prepare blanks for the collection of this data. The Geological Survey agreed to detail Dr. S. W. Beyer to visit the various plants in Iowa and study their methods of manufacture, carrying on temperature, shrinkage, drying and other tests, and collecting samples for further laboratory studies. Chemical analysis of the clays are to be made by Dr. J. B. Weems, of the college. Cross-breaking, rattler and absorption tests of the bricks are to be made in duplicate at the college and the State University, and tensile strength and other physical tests of the clays are to be carried on at the same time. The manufacturers are furnishing the material for these tests and bearing a portion of the expense. It is expected that when complete they will yield very important information, and will be of material aid in developing the paving brick industry.

It is hoped that this work will prepare the way to the opening of a complete clay-testing laboratory at Ames. At present the college has no room to spare for the work, nor sufficient available funds to carry it on. It is expected that the work on paving brick will be of sufficient practical importance to induce the authorities to provide the necessary funds for further work.

Before adjournment the following resolutions were adopted:

Whereas, The clay resources of Iowa have been shown by the Geological Survey to be vast and varied; and,

Whereas, These resources are as yet largely undeveloped; therefore, be it

Resolved, That the plan of investigation here outlined is heartily indorsed, and the co-operation of the machine manufacturers, brickmakers and all others interested is urged. Furthermore, be it

Resolved, That the State be urged to establish at Ames a complete laboratory for the testing of clays and clay products.

H. F. BAIN, Secretary.

Written for the CLAY-WORKER.

THE AGITATOR.

There's something wrong;
I don't know what it is, but yet
I'm going to rest, and then you bet
I'll pry until I find it.
I've worked too long!
I've felt the cry of hunger cease;
I've seen the glory of joy and peace;
But what's behind it?

Oh startling thought!
Why are the toilers all so glad?
Why run the works so smooth? Egad!
The earth is full of peace alike
Unto Heaven. I've caught
The cause. See! we're the strong,
And toil, for us, is fiendish wrong,
Up, boys, let's strike!

B. J. D.

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Books for... Brickmakers.

"CLAY GLAZES AND ENAMELS,"	Henry R. Griffen, C. E.	$ 5.00
"BRICKMAKER'S MANUAL,"	Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	J. J. W. Billingsley,	1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

RAYMOND

BRICK MACHINERY

Where it is Used.

In answer to many inquiries as to where our Machinery can be seen in operation, we submit the above diagram.

RAYMOND BRICK MACHINERY is now used and in daily operation the world over. ☘ Place your finger on the map and you are almost sure to place it upon a Raymond Brick Machine. ☘☘

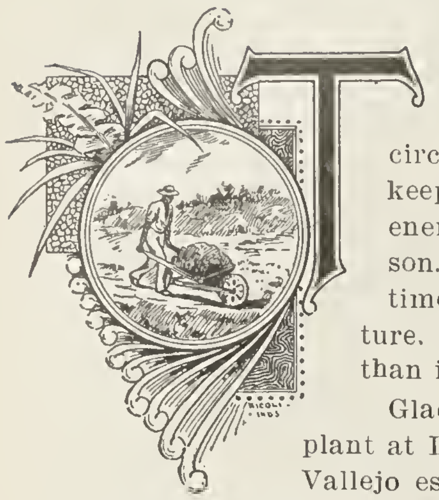
Our great success has not been obtained without merit. ☘☘ Buy Raymond's and you get the best.

☘

C. W. RAYMOND & CO.
DAYTON, OHIO, U. S. A.

Written for the CLAY-WORKER.

PACIFIC COAST NEWS.



THE BRICK and terra cotta trade is a little slow, the reason being attributed to lack of activity in building circles. Everybody is doing enough to keep things going, but there is not the energy manifest that should be at this season. The dealers are sanguine and better times are looked for within the near future. Business on the whole is better now than it was at the same time last year.

Gladding, McBean & Co. are running their plant at Lincoln, Cal., at full capacity, but their Vallejo establishment is idle at present.

John G. McMillan has returned to Republic, Wash., from a brief visit to Summit camp, twelve miles west of Republic.

At Lund, Nev., a new brickyard will soon be started.

The Diamond Vitrified Brick Company has been organized at Portland, Ore., by George W. Bates, F. S. Akin, Sidney Smyth and Harry Howard for the purpose of supplying vitrified brick for street paving in Portland. This company has secured the extensive plant and clay banks formerly owned and operated by the Jensen Paving Company, located at Russell, Wash. They have been operating the plant since last January, and turning out 15,000 brick per day. The company has purchased new machinery, and when it is placed in position the daily output will be increased to 25,000.

Craycroft & English have commenced the manufacture of brick at Visalia, Cal. The brick are molded by machinery.

S. L. Butler, of New Whatcom, Wash., has samples of fire clay which he says analysis shows to be excellent. It comes from Orcas Island, Wash., is only one mile and a half from deep water and near a good wagon road. The discoverer thought he had an aluminum mine until he sent samples to Washington city for testing, when he was given an analysis showing 60 per cent. silica, 14 per cent. aluminum and 4 per cent. iron. It is claimed that the longer it is burned the whiter it gets.

The contract for 27,000 square feet of brick sidewalks at Fort Wright, Wash., has been let to J. S. Christy, of Spokane, Wash. Work will be commenced as soon as the material can be hauled to the ground.

Hans Gottfredson is interested in a discovery of kaolin, or pottery clay, recently made in the mountains near Glenwood, Utah. The clay is a pure white, of very fine texture, and is adapted to the manufacture of queensware. It can also be made into excellent fire brick. Mr. Gottfredson is going to organize a company to develop the claim.

The Spokane Brick and Lime Company, of Spokane, Wash., has purchased the business of the Idaho Lime Company. The headquarters have been moved from 249 Main avenue, where the former firm was located, to 328 Main avenue, the location of the latter.

The brickyard of the West Kootenay Brick and Lime Company, at Nelson, B. C., is now producing 18,000 bricks daily, for which there is a good demand.

A valuable discovery of fire clay has been made at Corona, Cal., by W. G. McVicar and J. Findlay. The strike was made close to the town and at a depth of ninety feet from the surface. The vein of clay is seven feet in thickness. It has been tested both by the Pacific Clay Company at Corona and the Los Angeles Pipe Company at Los Angeles, Cal., and in both instances pronounced the best of quality. Both the factories named will use the clay in their business.

Peterson & Rushmyer, of San Jose, Cal., have leased a ten-acre tract of land at the northeast corner of Whisman road and the railroad at Mountain View, Cal., for a brickyard. They have the contract now for making 800,000 brick, and expect to employ fifty to sixty men when they are well under way.

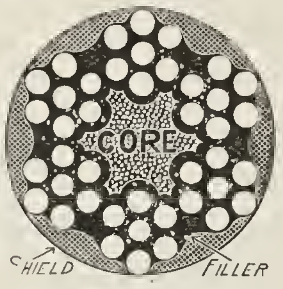
The Santa Ana, Cal., brickyard is employing a full force nowadays, and will probably continue in operation till the fall rains set in. There have been manufactured so far this season 600,000 brick, about 300,000 of which have been sold at Santa Ana and 100,000 in Orange, Cal. The rate at which the bricks are made is about 8,000 per day.

T. B. McCarthy, of Coulterville, Cal., has orders for 1,000,000 brick. The Merced Gold Mining Company will take 500,000 to be used in the construction of an office, a vault and in the enlargement of their mill property. Mr. McCarthy will erect a fine three-story brick hotel to contain forty rooms.

San Francisco, Sept. 5, 1899.

PROTECTION OF WIRE ROPES.

THE WIDELY DIFFERENT uses of operative wire ropes, subjected to as varying conditions, have presented a serious problem in the acquisition of a coating for exterior protection to satisfactorily answer the wide range of requirements. A dry atmosphere, tending to speedy oxidation and brittleness and consequent sloughing off of coating, presents itself in one location, while at another a moist atmosphere or possibly an almost continuous subjection to water, sometimes impregnated with acid, prevails. Many exposed wire ropes are subjected to the extremes of summer and winter. The illustration herewith presented shows application of a special coating termed "Wire Rope Shield, which possesses the requisites of a satisfactory coating in being tenacious, pliable, lubricating, water-proof and free from destructive acid. As will be apparent from the illustration, the high points of the strands are protected from abrasion by a lubricating film deposit, and a like deposit prevents chafing of the wires. The wire rope is completely sealed to resist acid, atmospheric, gaseous, sulphurous, or water attacks. The satisfactory use of this shield on wire ropes, from an office building to extremely wet mines strongly impregnated with acid and to dredging machinery constantly subjected to water, indicates its efficiency. The illustration also shows an interior material termed "Wire Rope Filler," a flexible cushioned lubricant protecting from abrasive wear, and effectually sealing against water-soaking, acid or gaseous attacks, incorporated in the manufacture of wire ropes, and adopted by many of the prominent wire rope manufacturers in making all sizes and kinds of operative wire ropes. An evident increase of life results from the external protection afforded by the shield, and further benefits where applied to a wire rope already treated internally with the filler. The Ironsides Company, Columbus, Ohio, manufacture these materials.



SYSTEMATIZE, REGULATE AND CLASSIFY.

System—method. Common words, but they mean much. In fact, I don't believe anybody can attain success in business without practicing a systematic course, following it religiously.

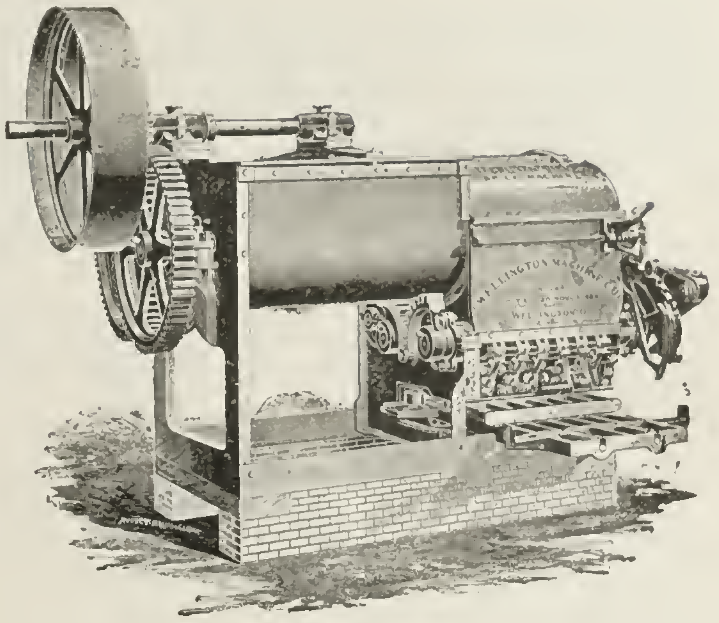
Take, for instance, the man who has never learned to read or write; one or two of them are to be found in every community. Such a man keeps his accounts in his memory, seldom forgets, and often does business over several counties, all as the result of a system of his own devising. He illustrates the practical value of a system.

Every successful man has working ways of his own, a general operating plan of his business that he has evolved and perfected himself. Such things are not learned in books; a system that economizes labor, saves useless expense and makes one stone kill the maximum number of birds.

I have made a study of this particular trait of business nature, and I've nearly succeeded in convicting every man who fails for lack of system. Other shortcomings work havoc, of course, but method is mother to them all.

Conducting a business without system is akin to running a modern railroad without a time schedule. Such derelicts of commerce are useless in themselves, dangerous to others, and should be dealt with as severely as those who persist in using kerosene to light the fire.—Ad Sense.

SPECIAL.



FOR SALE:

A Cheap Brick Machine.

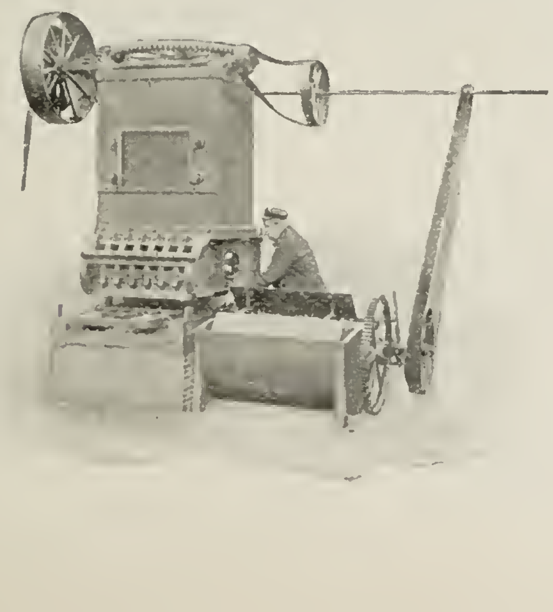
DEAR READER:—

We have been selling machines 20 years, and it has been pounded into us, year after year, that the trade wants the **cheapest** machine, and the trade is right. A brick machine isn't bought for a years use, but for many. Like when selecting a wife it pays to look ahead five, ten and 20 years and consider how she will wear and what she will cost after the first expenses of getting possession. Many a brickmaker has bought a "pretty good" machine at an "attractive figure," like many a young fellow who marries a "pretty good" girl with an "attractive figure" and in a short time finds them so expensive to keep up, that he rues the day he overlooked getting **brains and reliability** when selecting. Can't buy brains? You bet you can. They are incorporated in a machine, in so constructing it, that it will not only make a perfect brick, but stand up to the work, year after year. "Attractive figures" is a time-worn bait. Wise men don't bite. **Reliability** is really the most important point to consider.

> MORTON, PA., July 4th, 1899.
>
> THE WELLINGTON MACHINE CO.— * * * I have used the **"Monarch" Machine** three years and never had a breakage, nor lost an hour on account of the machine.
>
> Yours truly, H. I. ACKERMAN.

This one is only a sample. In our circular are **many more** stating the same thing. The **dear** machines (which sell at a cheap **first** cost) cannot show such. They give fine "first year" testimonials, but none with the flavor of age. We give a large proportion **after** machine has been used several years. "To get your money's worth," you **must** buy for the **future.**

Remember, that we cannot tell it all here, but that we give you a few pointers to get you started right towards getting the **cheapest** machine in the market. It is cheapest because it does perfect work, and counting three years, five years, ten years or more, it will cost you much less than any other. No other has 14 feet of pug mill. No other has double presses. No other has a press but what wears. We have sold to the most conservative and careful buyers who investigated its record, principles and construction. Just get our circular and see what they say, and also study the "points" in this machine. There are many important ones contained in no other machine. Coal costs money. **Under like conditions** the **"Monarch"** takes one-third to one-half less power. Figure that saving for next ten years.



For yards of ordinary capacity our "IRON QUAKER" has lead for years. Both Horse and Steam power.

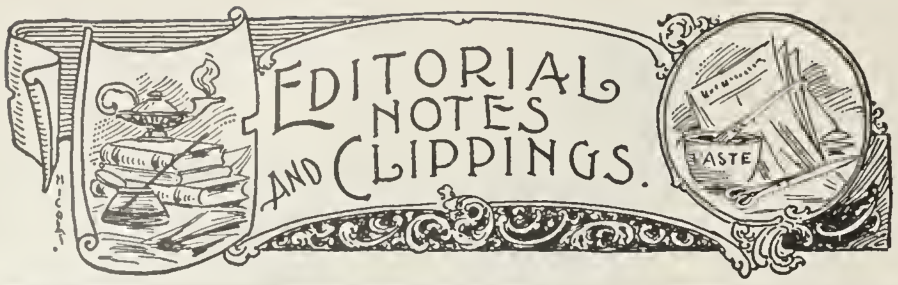
A Full Line of Supplies, and Auxilliary Machines.

BALL-BEARING Barrows and Trucks.

Send for Circular.

The Wellington Machine Co.,

WELLINGTON, OHIO.



EDITORIAL NOTES AND CLIPPINGS.

Curry Run, Pa., is to have a new fire-brick plant.

Salina, Kan., contemplates the erection of a large brick plant.

J. B. Fahey contemplates the establishment of a brick plant at Chinchuba, Miss.

F. W. Clark & Sons, Rome, Ky., are in the market for a good second-hand clay crusher.

According to the "Standard," of Eureka, Cal., a brick and tile plant is greatly needed at that place.

The Warren (Ohio) Brick and Tile Company is putting up a new kiln with a capacity of 100,000 brick.

The explosion of a gasoline engine at the plant of the Table Rock (Neb.) Clay Company caused a damage of $1,500.

Frank Lander, Lincolnton, N. C., wants to purchase a second-hand brick machine of 15,000 to 20,000 per day.

There is a brick famine at Corsicana, Texas, and the contractors there would like to have a good brickmaker locate in that vicinity.

The Victoria Brick and Tile Company has been incorporated at Victoria, Tex., by F. B. Lauder, T. A. Heath and others. The capital stock is $8,000.

The Albright Brick Company, Bridgeport, Pa., has taken out articles of incorporation. C. E. Albright, H. L. Albright and H. L. Crawford are interested.

W are advised by H. K. Terry, of Richmond, Va., that there is a splendid opening at Charlotte, N. C., for a practical brick manufacturer with some capital.

J. M. Kenney, of Broadland, Ill., will be pleased to correspond with parties who can furnish drain tile or sewer pipe in large lots for use in southwestern Louisiana.

The Suburban Brick Company, Wheeling, W. Va., will establish another brick plant, with a daily capacity of 100,000 brick. They expect to put $50,000 into the plant.

Nonnemacher Bros., Allentown, Pa., sustained a loss of $500 by fire, which destroyed some of the buildings at their brick plant. The burned portion will be rebuilt at once.

J. P. Norton & Son, of York Corner, Me., suffered a loss of $200 by the burning of some kiln sheds and adjoining buildings recently. The loss is entirely covered by insurance.

The Sellersburg Clay Company has been incorporated by E. N. Vicht, J. M. Nickles, J. T. Heistand and A. E. Snodgrass at Sellersburg, Ind. They have a capital stock of $10,000.

R. E. Kreager and August Saul have purchased a tract of land at Dallas, Tex., on which they will erect a pressed brick manufactory, where they will turn out 30,000 brick per day.

R. I. Nethercott, of Bridgeport, Conn., has been elected president of the Donnelly Brick Company, of New Britain, thus filling the vacancy caused by the death of M. H. Donnelly.

S. L. Light, of Lebanon, Pa., has opened up a new brickyard at Hebron, Pa. At present the yard has a daily capacity of 50,000, but this will be increased later on as the demand increases.

The employes of the Fort Dodge (Iowa) Brick and Tile Works struck for an increase in wages the first of the month. The proprietors offered to compromise and the men have gone back to work.

James H. Beggs, the well-known president of the Delaware Terra Cotta Company, Wilmington, fell while at the brickyard recently and sustained painful injuries, prominent among them a broken collar bone.

Mowbray & Lowes, of Geneseo, Ill., have just turned out their first kiln of pressed brick, and are highly pleased with the results. It is their intention to go into the manufacture of pressed brick quite extensively.

The large dryer at the brick plant of the Leavenworth Paving and Brick Company, Leavenworth, Kan., was completely destroyed by fire Sept. 1. There were 60,000 green brick in the dryhouse, which, of course, were ruined. Superintendent Carr estimates his loss at $5,000, which is entirely covered by insurance. The burned portion of the plant will be rebuilt at once.

The Harbison-Walker Fire Brick Company, of Pittsburg, Pa., broke ground recently in East Clearfield, Pa., for the erection of a large fire-brick works. The plant will have a capacity of 30,000 per day.

A new firm has been incorporated at Salt Lake City, Utah, for the manufacture of brick. Thomas D. Dee, G. H. Matson, C. H. Kircher and E. W. Matson are the directors. They will have a capital stock of $10,000.

The Hawkes Brick Works, of Westbrook, Me., will manufacture hollow brick in addition to the manufacture of common building brick. They claim they are the only factory in the State of Maine manufacturing hollow brick.

Michael Sheehan, an employe at the Denver (Col.) Pressed Brick Company, was caught under a falling bank of clay and instantly killed. Another man was caught at the same time, but was extricated in so short a time that he suffered but little.

Four men were killed by the caving in of a kiln of unburned brick at the yard of G. W. Washburn & Co., Catskill, N. Y. The men were setting the brick in the kiln when it collapsed without any warning, and the men were buried beneath 200,000 brick.

Alfred J. Brooker, who for forty years or more has been identified with the brick manufacturing interests of Ohio, passed quietly away at Findlay, Ohio, Aug. 19. Mr. Brooker was sixty-three years old and had spent most of his life in Findlay.

The Milton Pressed Brick Company, of Milton, Ont., have just completed the first burn in their New Peerless down-draft kiln with splendid success. In a letter Mr. J. L. McConnell, general manager, writes: "It is the most economical kiln at our works."

A scheme is on foot to establish a paving brick plant at Newport News, Va. Dr. Leon Labonde is very much interested in the project, as he is the inventor of a process by which he can make, he claims, good pavers out of the sand in James river.

From all over the country come rumors of an immense fire-brick combine to include the plants in Ohio and Kentucky. The capital stock will be upwards of $6,000,000. The Guaranty Development Company, of New York city, is at the head of the movement.

The American Art Tile Company has been incorporated at Columbus, Ohio, with a capital stock of $50,000. E. Denmead, P. Jones, J. A. Donald and others are interested. The main office will be in Columbus, while the plant will be located at Upper Sandusky, Ohio.

H. W. and F. Thies have opened a brickyard at Laurel, Anne Arundel county, Maryland, and will burn an experimental kiln of brick. If the brick turn out as they expect they will enlarge the plant, putting in the latest improved machinery and appliances necessary to a large output.

C. Hufnagle, of Elwood City, Pa., has recently been selected to succeed Mr. W. H. Hoagland as manager of the Cayuga (Ind.) Press Brick Company. He has previously been connected with the Elwood City (Pa.) Press Brick Company and the Kensington (Pa.) Brick Company.

George E. King, of Guadalajara, Mexico, writes that he has recently booked a contract for twenty million brick for the sewer system in the City of Mexico. He is using a Ross-Keller six-mold machine, with which he is highly pleased. He says his brick are the best made in Mexico.

In a recent letter T. C. Lundy, superintendent of the Garden City Brick Company, Farmingdale, N. Y., says: "We are having a good trade, and I am happy in the thought that at the end of the year the Garden City stockholders will wear a smile, as the secretary announces a satisfactory dividend. We are certainly progressing."

The Marion Brick Works have commenced the erection at their Montezuma works of two peerless down-draft kilns, with a capacity of 200,000 each. Owing to the increasing demand for the company's sand-faced front bricks this addition to an already large kiln capacity was a necessity and but the commencement of further developments.

The plant of Robert Nesch at Pittsburg, Kan., was damaged to the extent of $75,000 and four men were killed and five men badly injured by the explosion of a boiler. The killed are: David Boyd, engineer; James Holman, fireman, and Henry Cole and John Heath. While Mr. Nesch himself escaped injury his son was quite seriously burned. It will take at least six weeks to get the works in good working condition

CONTINUED ON PAGE 226.

YOU LOSE—

DOLLARS!

• • • • • •

There's more than one way to lose a dollar besides dropping it down a crack in the walk.

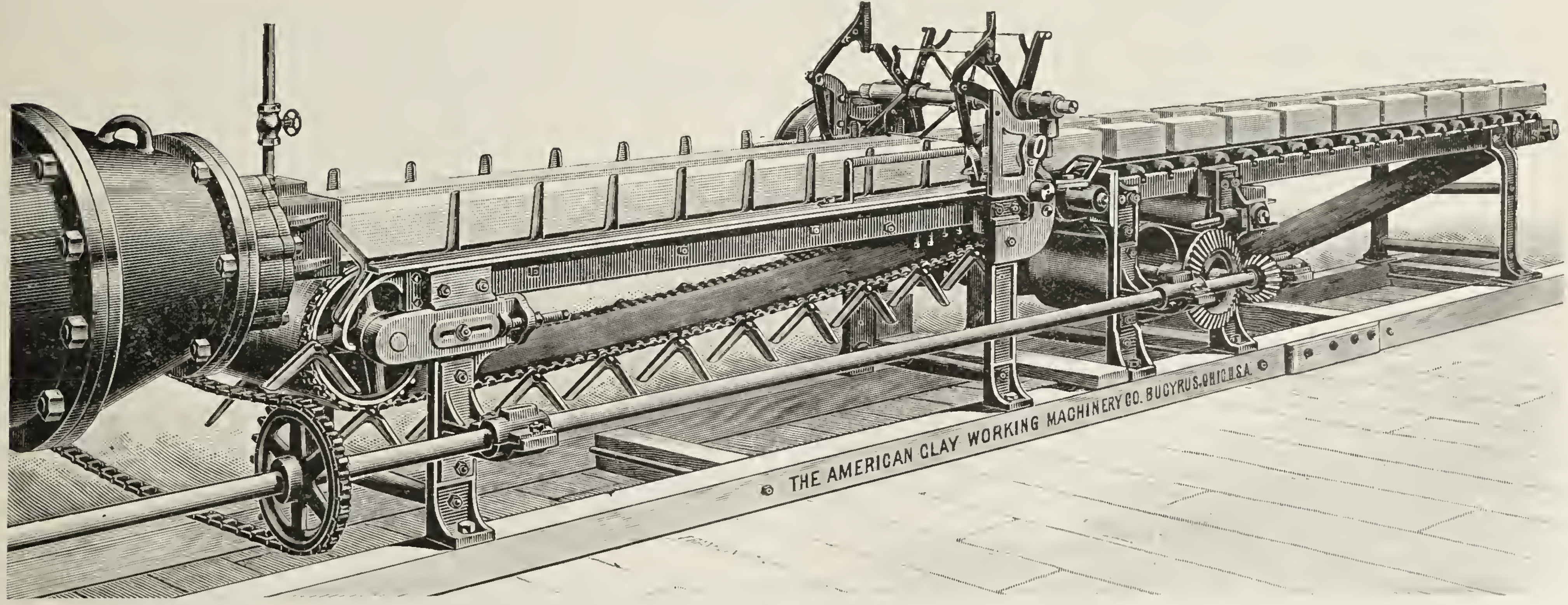
If you are in the clay manufacturing business the two most important sources of loss are through faulty machinery and slow machinery.

Possibly no machine is perfect but ours are the nearest that point there is.

We have made a combination of the most approved patents, the very best labor and faultless material, which makes it possible for us to guarantee the operation of our machinery. It is **"Built Right, and Runs Right"** and there are no delays or expensive break downs where the American line of machinery is installed.

If you contemplate any improvements you owe it to yourself to look into the merits of our line, it will be money in your pocket for every working day. We build a complete line of clay-working machinery and appliances.

Write for Catalogue and Information.


THE AMERICAN CLAY WORKING MACHINERY CO. BUCYRUS, OHIO U.S.A.

No. 1 AUTOMATIC BRICK CUTTER and SEPARATOR FOR END CUT BRICK

THE MACHINERY THAT NEVER DISAPPOINTS

The American Clay-Working Machinery Co.,

BUCYRUS, OHIO, U. S. A.

See Ad. on Page 246.

EDITORIAL NOTES AND CLIPPINGS—Continued.

again. The plant is one of the largest in that section, and have been operated day and night the past season.

J. A. Morrow has commenced the erection of a new brickmaking plant at Toledo, Ia.

The American Brick Co., of New York city, will establish a new plant at Athens, N. Y.

W. M. White, of Thomasville, Ala., desires to correspond with manufacturers of brick machinery.

The Atlas Press Brick Works, of Dallas, Tex., is in the market for a two or three-mold dry press.

The Madison Brick Co., of Summitville, Ind., has been incorporated with a capital stock of $15,000. The directors are T. E. Strange, A. D. Smith and A. W. Werden.

The Sellersburg (Ind.) Clay Co. has been incorporated by E. E. Wicht, J. M. Nickles, J. T. Reistand and A. E. Snodgrass for the manufacture of brick, tile and cement. They have a capital stock of $10,000.

Mexico, Mo., is to have a large fire brick plant, for which St. Louis parties are putting up most of the capital. Cuthbert Dixon, of Mexico, is at the head of the movement, and will probably be general manager of the plant when it is under way.

Oshkosh, Wis., has been investigating the merits of different paving material. As a result a large amount of brick pavements will be laid in that city the coming season. Some of the citizens of Oshkosh are desirous of having a paving brick plant locate there, as it is claimed clay suitable for pavers is found in abundance in that vicinity.

Dana W. Fogg, of Zanesville, Ohio, died Aug. 20 at Tlacotalpam, Vera Cruz, Mexico, of yellow fever. Mr. Fogg had been engaged in the brick business at Zanesville for more than twenty years, having been superintendent of the Royal Brick Company at that place. He went down to Mexico to erect a brick plant some time in March.

The death of Silas Shaw, a veteran brick manufacturer of Joliet, Ill., occurred at his home in that city Aug. 29. Mr. Shaw was born in Ogdensburg, N. Y., but moved to Illinois when quite young and has been engaged in the brick business for more than a quarter of a century. He will be sadly missed in the community where he had lived so long.

The large brick plant of D. P. Guise, of Williamsport, Pa., was totally destroyed by fire Aug. 28. It is thought the fire was the work of incendiaries. During the fire a quantity of dynamite, which was stored in the buildings, exploded, but fortunately no one was injured. Mr. Guise has been running his plant day and night and will rebuild at once.

The Arkansas Brick and Manufacturing Company, of Little Rock, Ark., have secured an order for ten million brick for the new State Capitol building. They are now putting in a new Ross-Keller six-mold machine and other machinery for a complete press brick plant, all of which will be furnished by the Ross-Keller Brick Machine Company, of St. Louis, Mo.

The Columbus (O.) Face Brick Co. announce that they now have ready for delivery a large stock of new Ironclay mottled flash brick, in standard and Roman sizes. Also shapes and ornamentals. They have a "tile brick sample" which weighs twelve ounces, and which shows the exact appearance in color and mottled effect of their standard building brick, which they will send free to architects and builders.

A comparatively new concern at Ottawa, Ohio, is the Clay Shingle Company, of which A. B. Klay is proprietor. It was started in the fall of 1897, at which time they turned out 1,500 shingles per day. Since then the demand for their product has increased to such an extent that they have put in another press, erected another kiln and enlarged their drying capacity. The prospects are now that they will have to repeat this operation the coming spring.

An item is going the rounds of the press, telling of the failure of the Mexican Clay Manufacturing Co., which has established an extensive sewer pipe plant near the City of Mexico. We are in receipt of private advices stating that, instead of being a failure, the plant is a decided success. They did have some trouble for a time, being unable to burn the ware satisfactorily, but the difficulties have been overcome, and the plant is now turning out good pipe. Credit for this is due to Mr. R. W. Lyle, the well-known clayworker of Woodbridge, N. J., under whose direction the plant is now being operated. It seems that Mr. Lyle was able to supply the one vital element to success—expert knowledge of clays and their proper manipulation— a case of technical knowledge turning failure into success. We are pleased to learn and announce that the plant is running satisfactorily, for it is a most important enterprise, the product of the plant being needed for extensive sanitary improvements in and about the City of Mexico.

For some time past the local papers have teemed with rumors of the organization of a great brick trust that is to absorb all the brickmaking concerns of southern and central New England, but as yet nothing definite has been learned. The combine is to have headquarters at Boston or New Haven, and is supposed to control the building brick business of that section. Positive announcement of the officers who will manage the business is promised soon, and the trust will commence operations, 'tis said, by the middle of November. The plants to be operated are reported to have a combined capacity of 325,000,000 brick a year.

The Wallace Manufacturing Co., Frankfort, Ind., write that they are having the largest trade in the history of the company. From the first of the year they have had a continual rush of business, and have been unable to get any machinery in stock. Though they have been working a full force of men fourteen hours a day nearly all the time, they still have orders ahead that will keep them very busy for some months yet. "'Wonder' machines are in such demand," they write, "that we have sold every second-hand machine we could find, and could have sold a great many more if they were to be had." This is gratifying, especially when it is remembered that "Wonder" machinery is advertised only in The Clay-Worker.

A DIRE EXTREMITY.

It seems that there is a higher office in this country than that occupied by Mr. McKinley. This office is held by a Mr. Gubbins, and its title is that of president of the Bricklayer's and Stone Masons' International Union. Mr. Gubbins informs the people of the United States that President McKinley will not to be allowed to lay the corner-stone of their new postoffice building at Chicago unless he becomes a member of the union. Neither the President of the United States nor any citizen thereof is allowed to handle a trowel in the city of Chicago withoue complying with this condition. Should the President be so insubordinate as to set a stone prepared by nonunion labor, that will be the last stone laid in this postoffice building. The masons belonging to the union will refuse to work on it thereafter or to let any one else work. Whether any way of purging himself of contempt of this trade is provided we do not know, but there is some danger of incurring the contempt of a larger union unless Mr. McKinley asserts his own independence and that of laborers in general. —[Exchange.

SITUATION WANTED—By expert continuous kiln fireman who can design and erect improved Hoffmann kilns of any desired capacity. Information and estimates cheerfully furnished. Address H. OFFMANN,
9 1 2 pm care Clay-Worker.

FOR SALE—ENTIRE OUTFIT.

Of a modern brickmaking plant consisting of boilers, engines, dry pan, pug mill, automatic cutting table and repress, trucks, tracks and lot of one-inch pipe for drying oven, having a capacity of 20,000 brick per day. Plant has not been in use over three months and was installed by Frey-Scheckler Co , of Bucyrus, O. Can be seen on premises three-fourths of a mile from Robesonia, Pa., on line of Lebanon Valley R. R. and reached by trolley line and a five minutes walk. For further particulars apply to
J. H. MALTZBERGER,
9 3 d Reading, Penn.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
TERRE HAUTE, IND.

POTTERY FOR SALE.

A first-class rock and yellow ware pottery, 4 kilns and all the modern improvements; now in full operation; clay mines near factory; railway siding and coalyard on premises. Address

SOUTH AMBOY POTTERY CO.,
9 1 c South Amboy, N. J., Box 24.

WANTED—An interest in a brick plant. An experienced manufacturer who quit the brick business during the dull season, wishes to re-engage in the business. Will take the general management of a plant and purchase same or an interest in it, if conditions justify. Will not invest until satisfied on the latter point.

Address, READY MONEY,
9 tf d care Clay-Worker.

Anglo=American
Pottery.

Old English China with American Views.

A MANUAL FOR COLLECTORS, BY

DR. EDWIN ATLEE BARBER, A. M., Ph. D.

Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc.

The book consists of about 170 pages, illustrated with 93 half-tone engravings of old plates and pitchers bearing American designs, produced by English potters between 1815 and 1840, and sketches of each English Potter. Over 500 different designs, in dark blue and other antique china are listed. The work will prove of great interest to all lovers of old crockery in America and England and will be especially valuable to collectors.

The price is $1.60 per copy, postage prepaid.

T. A. RANDALL & CO.,
The Clay-Worker.
INDIANAPOLIS, IND.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

FOR SALE — One clay pulverizer; as good as new; very cheap. Address
9 1 1 K., care Clay-Worker.

SITUATION WANTED — As maker of glazed brick, bath tub, sinks, etc. Excellent reference. Samples and references forwarded on application. Address
9 1 cm H. W., care Clay-Worker.

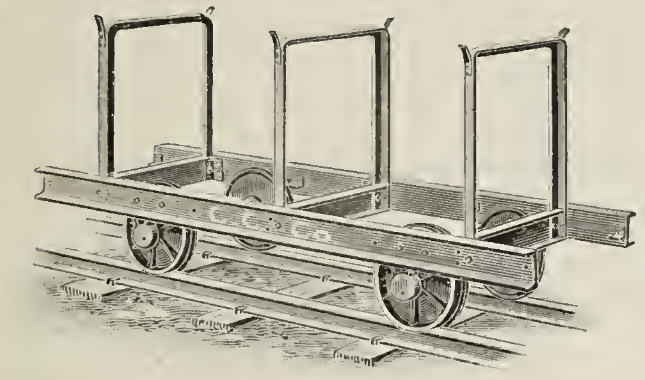
FOR SALE — Brick and tile works, in good condition; large capacity; plenty of market; would consider other property for part pay; now in operation. Address
D. W. TOWNSEND,
9 6 d Cherokee, Ia.

WANTED — A position as superintendent of sewer pipe, fire brick or paving brick works; practical in all departments; good references. Address BRICK,
9 1 c Care Clay-Worker.

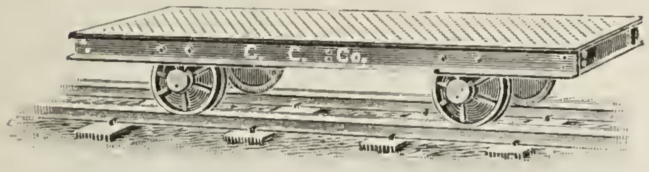
FOR SALE — Yard rights of the Swift stack, coal coking table, furnace, kiln, together with guarantee and protection; send for price list and catalogue.
F. E. SWIFT,
9 tf d Washington, Ia., U. S. A.

WANTED — Position as superintendent of stiff mud brick plant, fireproofing terra cotta, hollow building block; have had 15 years' experience in all ware made by stiff mud process. Address B. CANTON,
9 1 d Care Clay-Worker.

IRON DRYER CARS WANTED—The undersigned desire to purchase from 75 to 100 iron dryer cars, second handed, but they must be in good order. Address, with description of cars and price,
ADAMS BROS.-PAYNE CO.,
9 2 d Lynchburg, Va.



No. 231 DOUBLE DECK.



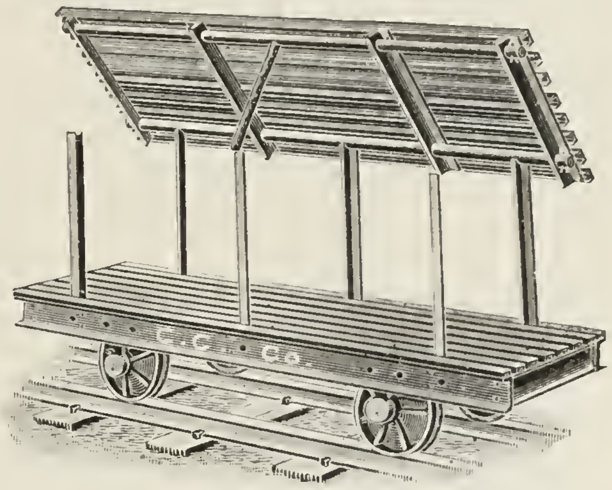
No. 214 SINGLE DECK.

CHANNEL
STEEL
BRICK CARS.

Quality Unexcelled.
Prices Reasonable.

Cleveland Car Co.,

150 Scranton Ave., CLEVELAND, OHIO.



No. 232 DOUBLE DECK, with Steel Decks.

Please Mention The Clay=Worker.

Have You Ever Considered This?

That a Very Small Quantity of

Dixon's Ticonderoga FLAKE GRAPHITE.

Say 5 to 10 per cent. added to the grease or oil that you are now using, will make you oil or grease do three to six times as much work and do it much better.

This has been fully demonstrated but if you want to prove it for yourself we will send you samples free of charge and a pamphlet giving full particulars.

JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

POSITION WANTED — Enameler is open to take charge of first-class plant. Satisfactory proof of ability given firms of good standing and ability only.

J. HIGGINSON,
8 3 p Grant Ave., Trenton, N. J.

FOR SALE — "New Haven" brick machine, manufactured by the Eastern Machinery Co., New Haven, Conn.; in use only a short time; in good working order, and complete in all its parts; price, $500. Address STANDARD BRICK CO.,
9 1 dm 492 Broad St., Newark, N. J.

WANTED—A thoroughly reliable man to take the superintendency of an established dry press and stiff clay plant in the West. The right man, one who knows his business and understands both processes, can secure a permanent and remunerative situation. Address, giving full references.
9 1 d WESTERNER, care Clay-Worker.

FOR SALE — Two-mold, three-mold and four-mold dry press brick machines, new and second hand; latest styles and all in first-class order; also several screw presses for ornamental dry press brick, cheap; we have bargains in these machines, and all are guaranteed to do their work.
WESTERN MACHINERY & SUPPLY CO., 159 and 161 La Salle St. Chicago, Ill. 8 1 p

POSITION WANTED — By Geo. J. M. Ashby; advertiser was associate editor of "Brick" from its first issue, July, 1894, to July, 1899; he has a good practical knowledge of clay industries and machinery, speaks six languages, has had official experience at foreign expositions and in dealing with juries; would be glad to act as representative at the Paris Exposition, or to take the management of a dry press brick works, with continuous kiln. Address 3716 Wabash Ave., Chicago.
9 1 d

FOR SALE.

1 Henry Martin horse-power brick machine, good order.
1 Standard wood frame horse-power brick machine, used but a few days.
1 Standard wood frame steam power brick machine, used to make about 100,000 brick.
4 Reliable hand brick machines, but little used.
1 E. M. Freese side-cut board delivery, but little used.
1 Wellington mold sander, but little used.

HORTON MFG. CO.
9 tf d Painesville, O.

MUST CHANGE HANDS.

A controlling interest in the Rich Hill Vitrified Brick and Tile Co. for sale or trade. Paid up capital stock, $17,540. Plant has 20 acres of land, on which is a 4 to 10 foot vein of shale, of which their brick are made. Directly under the shale is 3 to 4½ feet of fine coal, used for steam and burning. The plant has a 1,100 horse power engine and two large boilers; all in good working order; has been running this season; capacity, 20,000; the brick are moved on cars from machine to 50,000 capacity dryhouse, then to kilns; when burned can be loaded on cars on switch 20 feet from kilns; switch has connection with three railroads, and is 14 feet lower than bottom of kilns. Cause of change, death and outside business. For particulars address
RICH HILL VITRIFIED BRICK & TILE CO., Rich Hill, Mo. 9 3 c

FOR SALE.

Brickyard consisting of the following: Fifteen acres of clay land, one Brewer machine, one Little Wonder machine, two patent kilns, with elevator, one dryer and rolling shed, three sheds 25 by 100 feet, five rows of racks with pallets, two patent trucks, wagon, wheelbarrows, picks, etc. blacksmith shop with tools, one locomotive, one forty horse power engine, one dwelling house of eight rooms and shanties for workmen. This yard is located in the South, and in a perfectly healthy locality. No overflow, and can burn with wood or coal. Get all labor needed cheap. Commissary building. Profits of commissary will pay all labor. If party wants to make money here is a chance for a practical brickmaker. Ready market for all brick made. For further particulars write

C. H. BEALE.
115 Madison Ave., Montgomery, Ala.
9 3 lm

...WHAT THE CLAY WORKER NEEDS....

Is a belt that will accomplish the heavy work required of it,

holding the bucket firmly without slipping.--This the

Leviathan Belting

does better than any other, and, what is of more interest to Clay Workers, the LEVIATHAN will

WORK FOR YEARS IN A DUST CLOUD,

or exposed to weather conditions of any kind.

THESE ARE THE REASONS WHY LEVIATHAN BELTING IS IN SUCH GENERAL USE AMONG CLAY WORKERS.

MAIN BELTING COMPANY,
1221-41 Carpenter St., Philadelphia, Pa.

1221-41 Market St., CHICAGO. Send for Price List and Samples. 120 Pearl St., BOSTON.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

IF YOU NEED.. **Wooden Pallets**

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

• •

Get good Pallets from those who know how to make them. It will pay you in the long run. . . . . . .
Send for circulars and prices.

• • •

W. B. MERSHON & CO.,
Saginaw. East Side Mich.

Mention the CLAY-WORKER,
When writing to Advertisers
Mention the CLAY-WORKER.

Mey Detachable Chain Belt.

Ewart Detachable Chain.

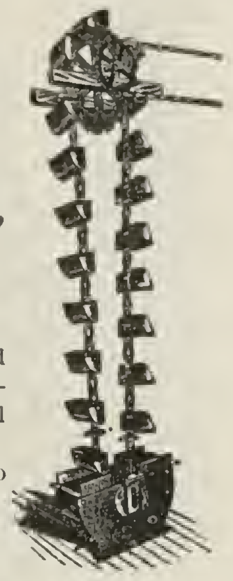
F. H. C. MEY,

Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.



THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to

MEY PATENT CLAY ELEVATOR.

Make
Many More
Thousands

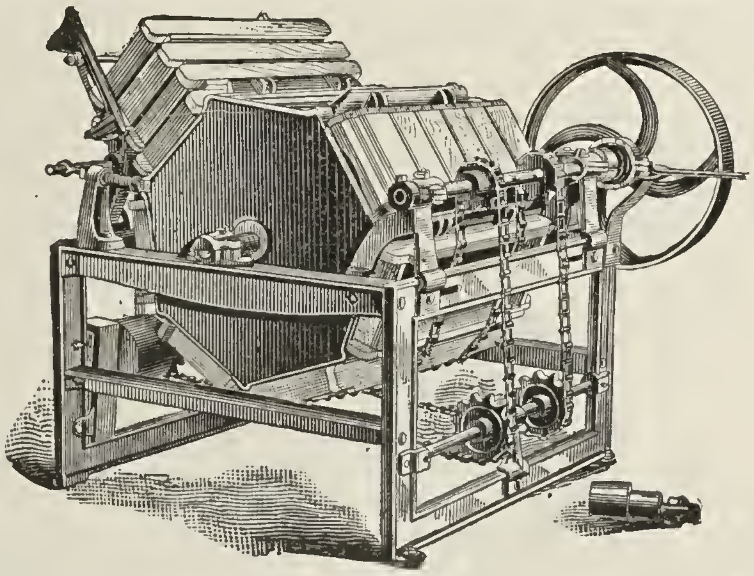
Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

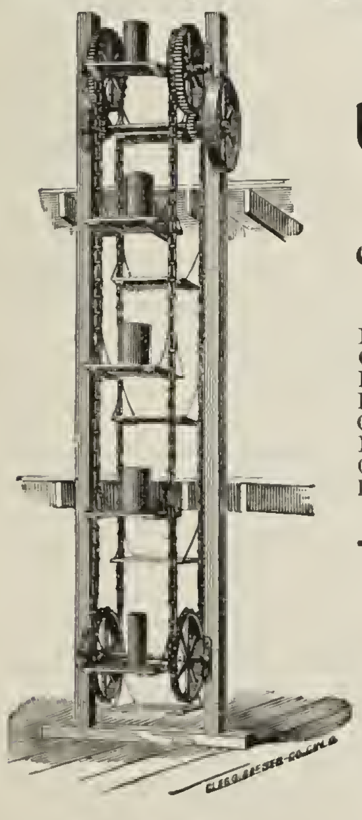


A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW. N. Y.

We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been sucessful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.



Tile and Package Elevators.

JEFFREY Elevating, Conveying and Power-Transmission Machinery,

Designed to Suit the Conditions for Handling

CLAY, BRICK, GREEN TILE, SEWER PIPE, SAND, COAL, Packages of every description, etc, etc.

- Elevator Buckets,
- Cable Conveyors,
- Elevator Bolts,
- Elevator Boots,
- Clutches,
- Rubber Belting,
- Cotton Belting,
- Leather Belting,

- Spiral Conveyors,
- Link Belting,
- Sprocket Wheels,
- Shafting,
- Gearing,
- Hangers,
- Pulleys,
- Chains, (all styles).

The JEFFREY MANUFACTURING CO., Columbus, Ohio.

Send in your Specifications. We want your next Order.

• • •

SEND FOR
1899 CATALOGUE.

FOR SALE — One of the best paying brick and tile factories in Iowa.
12 tf d Lock Box 36, Lohrville, Ia.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — Several second-hand chain hoists, from 2 to 8 tons capacity; also several engine lathes, boilers, engines, pumps, etc. Address CLEVELAND,
3 tf d Care Clay-Worker.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer,
6 tf d Wellsburg, W. Va.

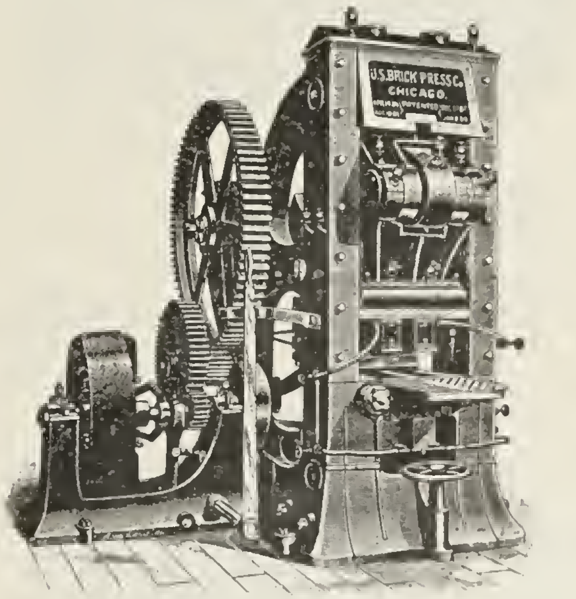
FOR SALE—GREAT BARGAIN—Henry Martin "A" Brick Machine, capacity 30,000, very good order; pug mill, crusher, elevator, shafting, etc, $750. All in first-class working order.
1 tf dm BOX 13, care Clay-Worker.

FOR SALE — One good 35 H. P. Chandler & Taylor engine; 40 H. P. tubular boiler; hot and cold water pumps; all in good condition. Will be sold cheap.
C. & A. POTTS & CO.,
5 tf d Indianapolis, Ind.

FOR SALE—Four-mold Boyd Dry pressed brick machine, quite new, at half cost. Capacity 25,000 to 30,000 per day. Also one 4-mold Eureka dry pressed brick machine, good order; great bargain. One straight line engine, 14x14 cylinder; excellent order; very low. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator.
C. SIEDLER, Pres.
9 tf d 156 Fifth Ave., New York, N. Y.

ENOUGH MATERIAL daily for 30,000 pink, buff pressed front brick, mined as an incidental product in getting coal. Want expert manufacturer with capital to build brick plant at the mine. Clay in mine cars delivered to crushers and coal dumped around kiln doors. Five acres for plant. Plenty of water. Favorable freights. Material for 1500 million brick besides large variety mixers in abundance. Give full references in first letter. Address,
7 3 c ALBERT PIKES, care Clay-Worker.

FOR SALE —Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address
OLD BRICKMAKER,
6 tf d Care Clay-Worker.



FOR SALE CHEAP.

The above two-mould United States Dry Press Brick Machine. Has never been used.
BAY STATE IRON WORKS, Erie, Pa.

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of
WESTBROOK & WELLS, Ogdensburg, N. Y.

FOR SALE CHEAP.

A Good Dry Press Brick Machine, in good running order, will be sold for less than half first cost. Its all right and a bargain. Have changed to Stiff Clay Process. Address

"SECOND HAND,"
1 tf d care Clay-Worker.

VanDuzen's STEAM JET Pumps.

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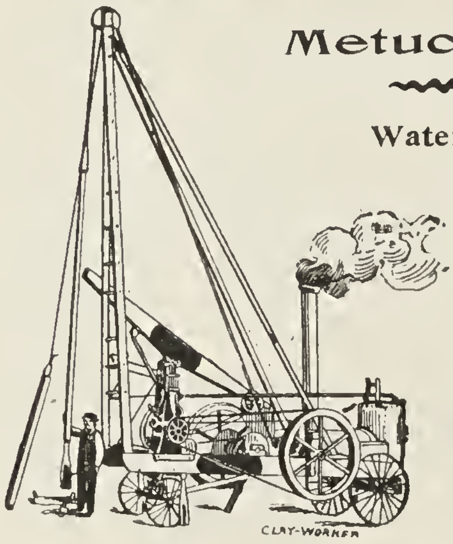

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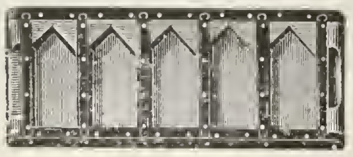

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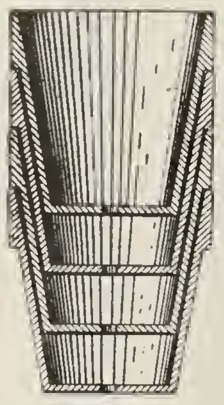

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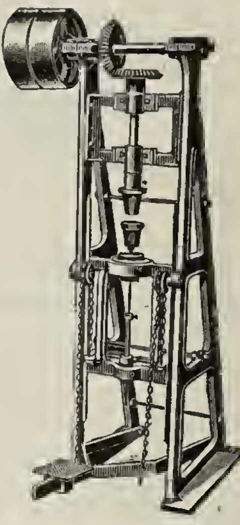

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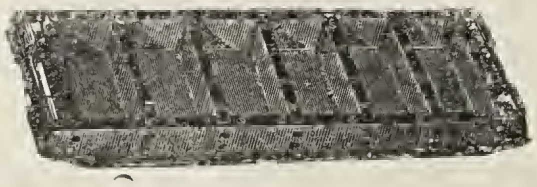

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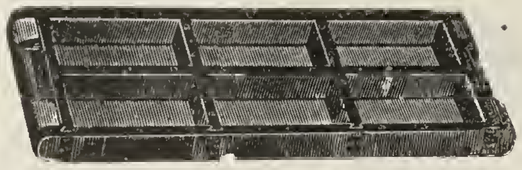

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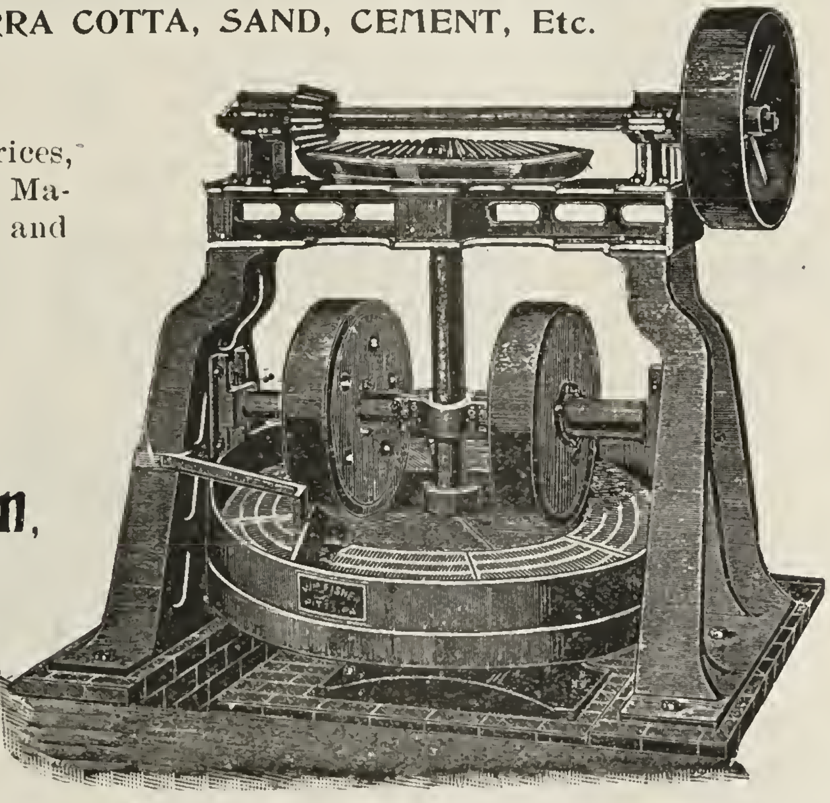

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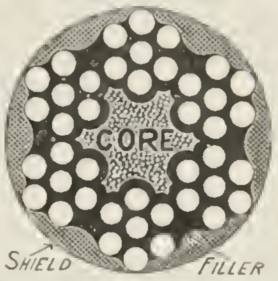

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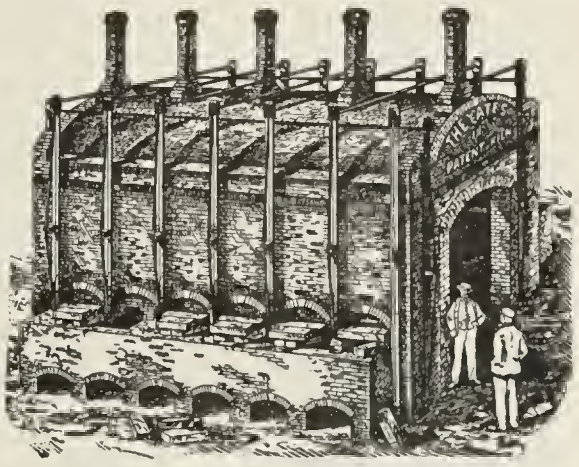

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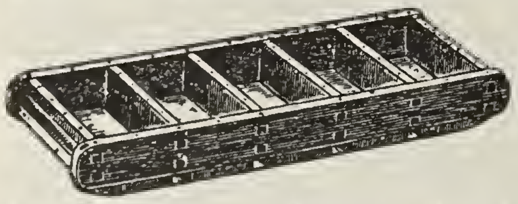

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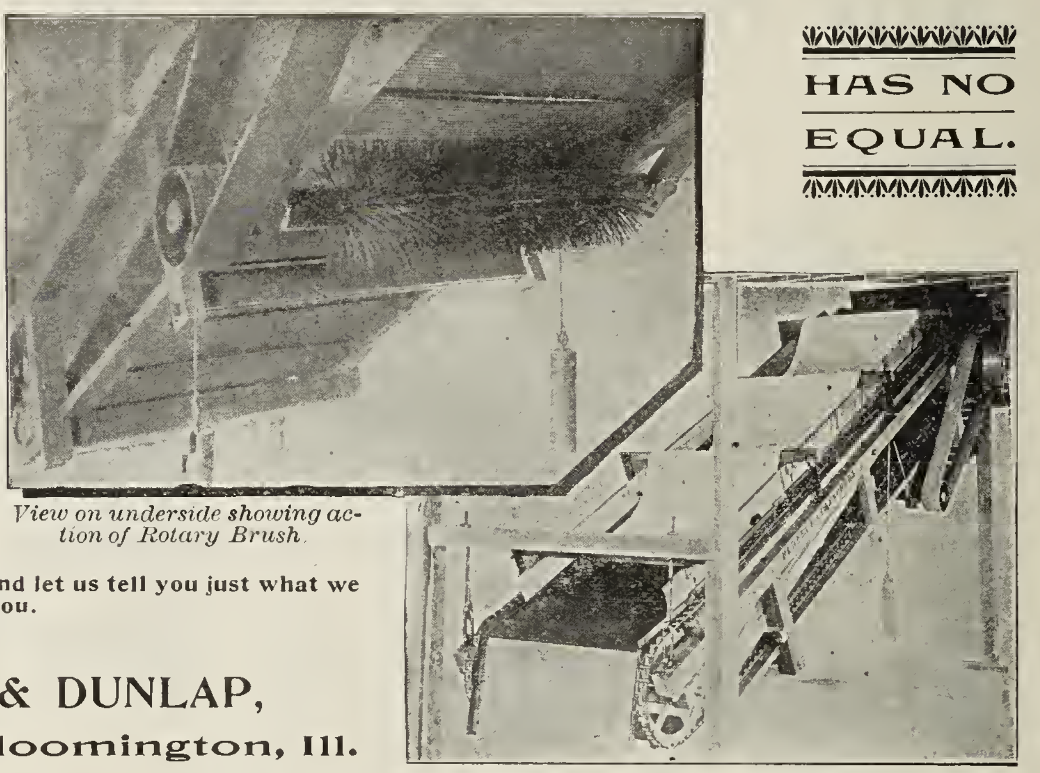

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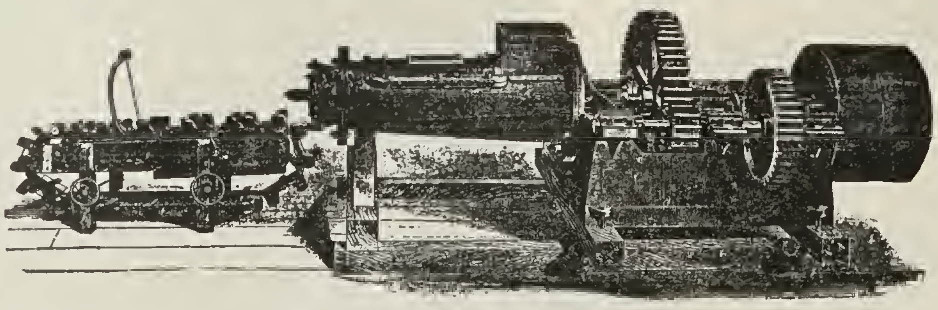

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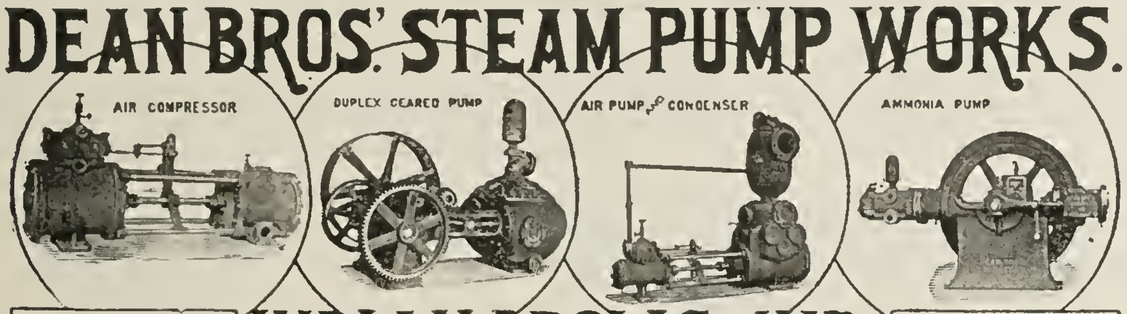

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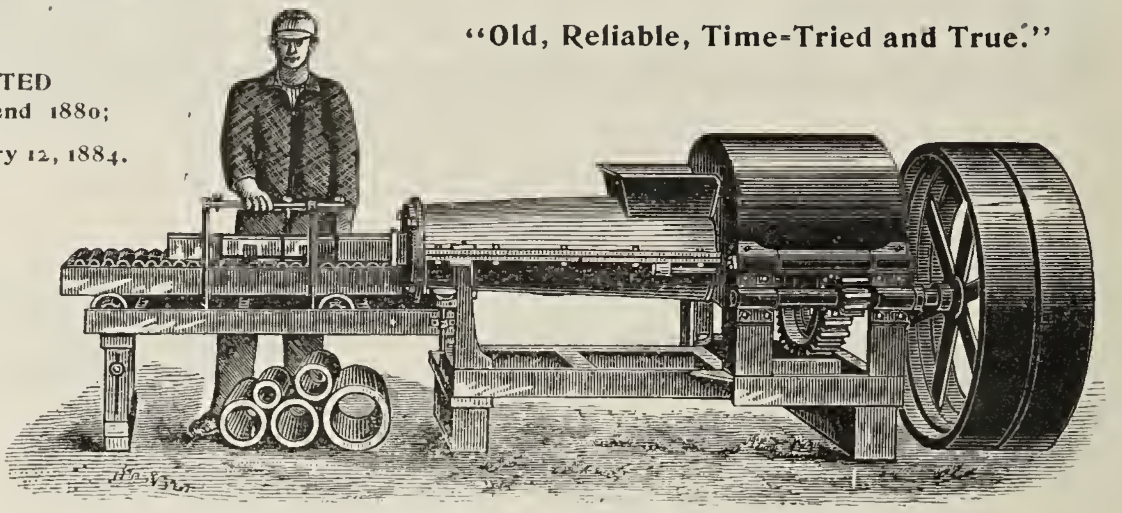

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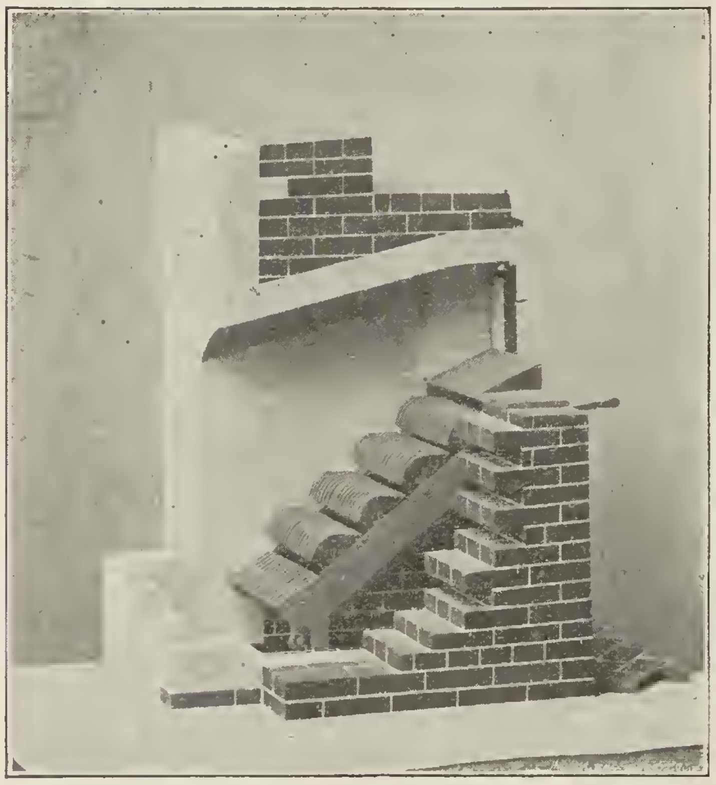

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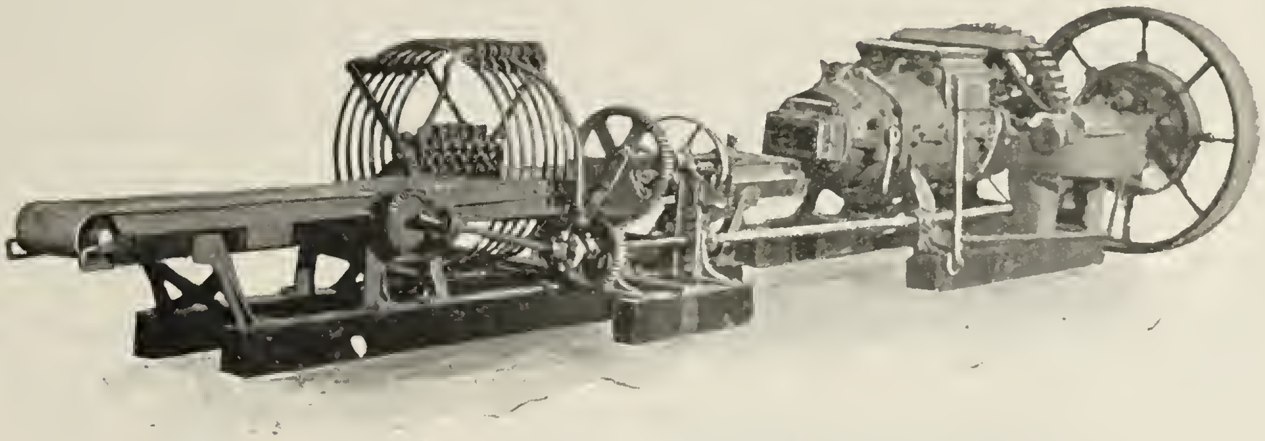

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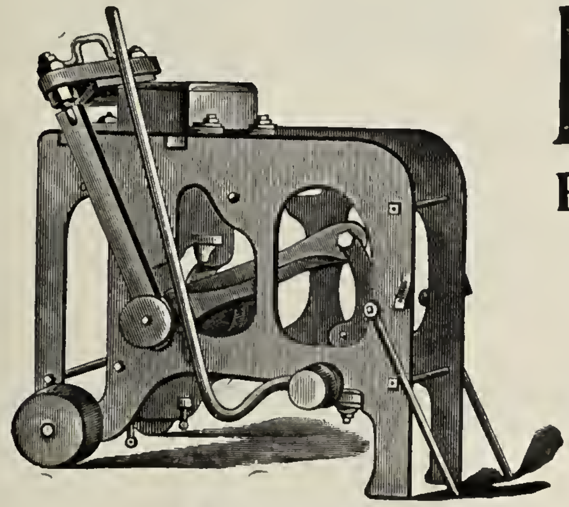

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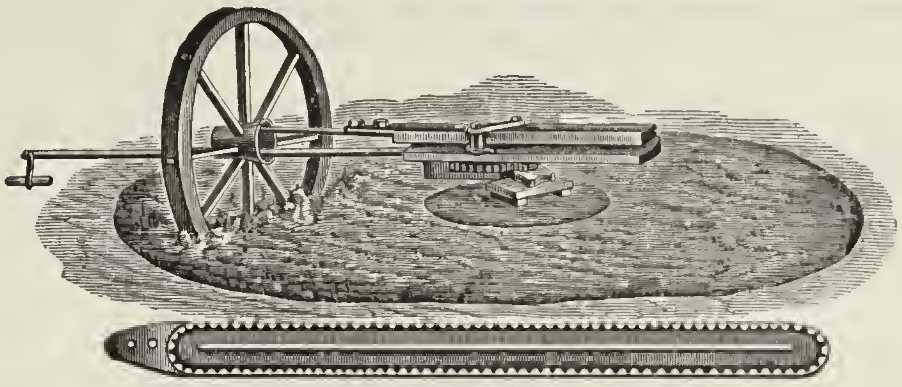

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of PHILADELPHIA,
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Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 Arch St., Philadelphia.
WORKS:—Perkiomen Junction, Penn.

HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

Horseheads Brick Co., N. Y., August 13, 1898.

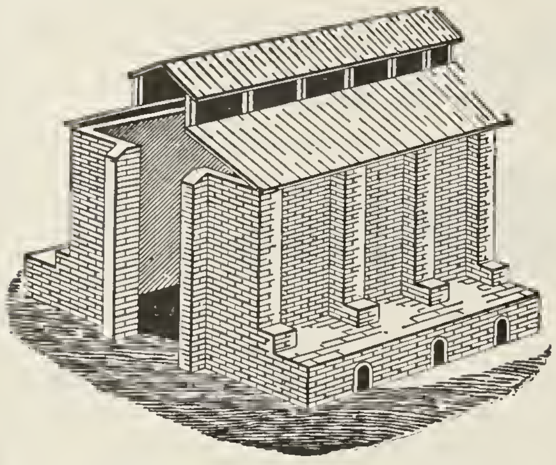
Mr. H. HAIGH, Catskill, N Y.

Dear Sir:—Replying to your favor of recent date, wherein you inquire as to how we are succeeding with the Haigh Continuous kiln, I beg to say that we are meeting with very good success. In fact we have been able to do much more than you had guaranteed the kiln would do. We got satisfactory results from the very start-out, and of course we are constantly doing better work at a lower cost.

We have reduced our fuel bills to less than half what it cost us before, and last, but not least, are producing a much better brick.

Respectfully yours, R. G. EISENHART, Treas. and Gen. Man.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

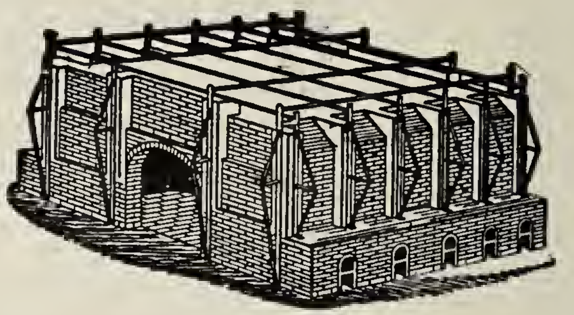


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL,* 2,422 Chestnut St., *Kansas City, Mo.

MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,

P. O. Box 335. ***ROME, GA., U. S. A.***

The Bushong Down Draft Kiln

Is so constructed that the **heat** is **equally distributed** to **all parts** of the **Kiln.**

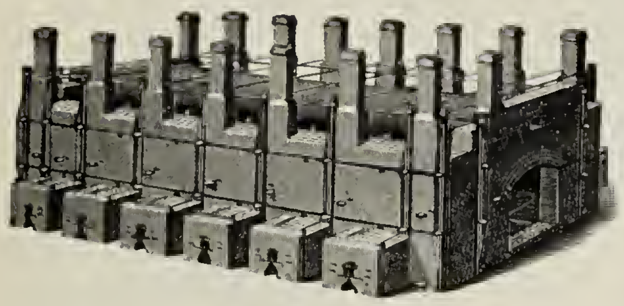
For **uniform** and **all hard burning** this kiln leads them all. Built any size desired. This kiln is now being used by some of the largest brick plants in the country.

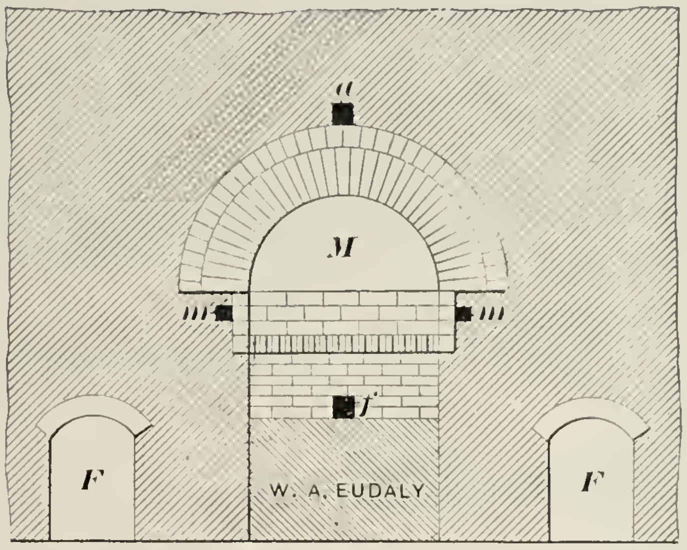
For further particulars, address

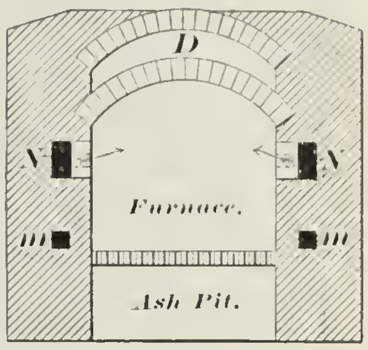
M. M. BUSHONG, - Phoenixville, Pa.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.







These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

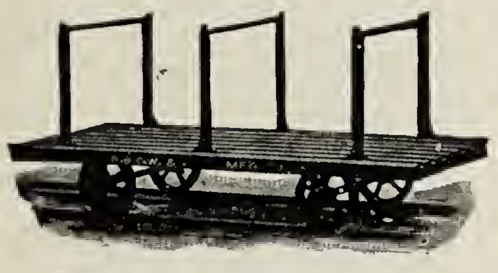
The Atlas Bolt & Screw Co.,

Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

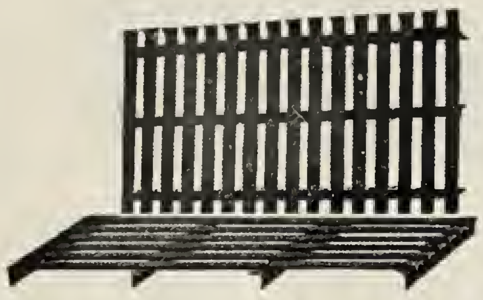
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

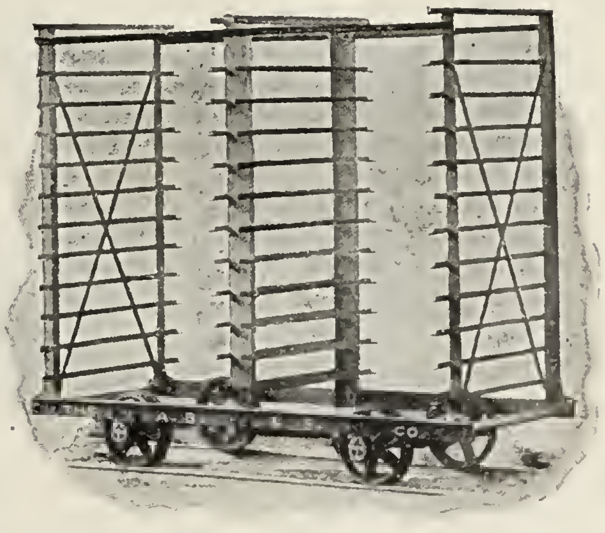
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

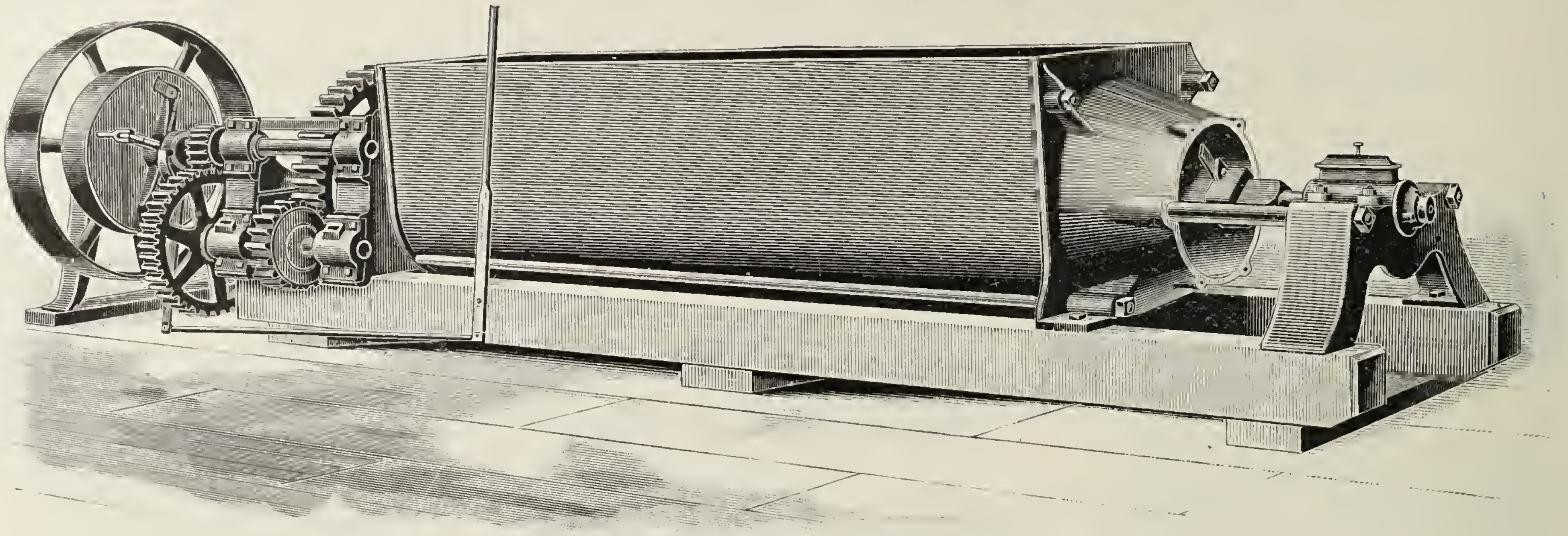
For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

A GOOD THING.



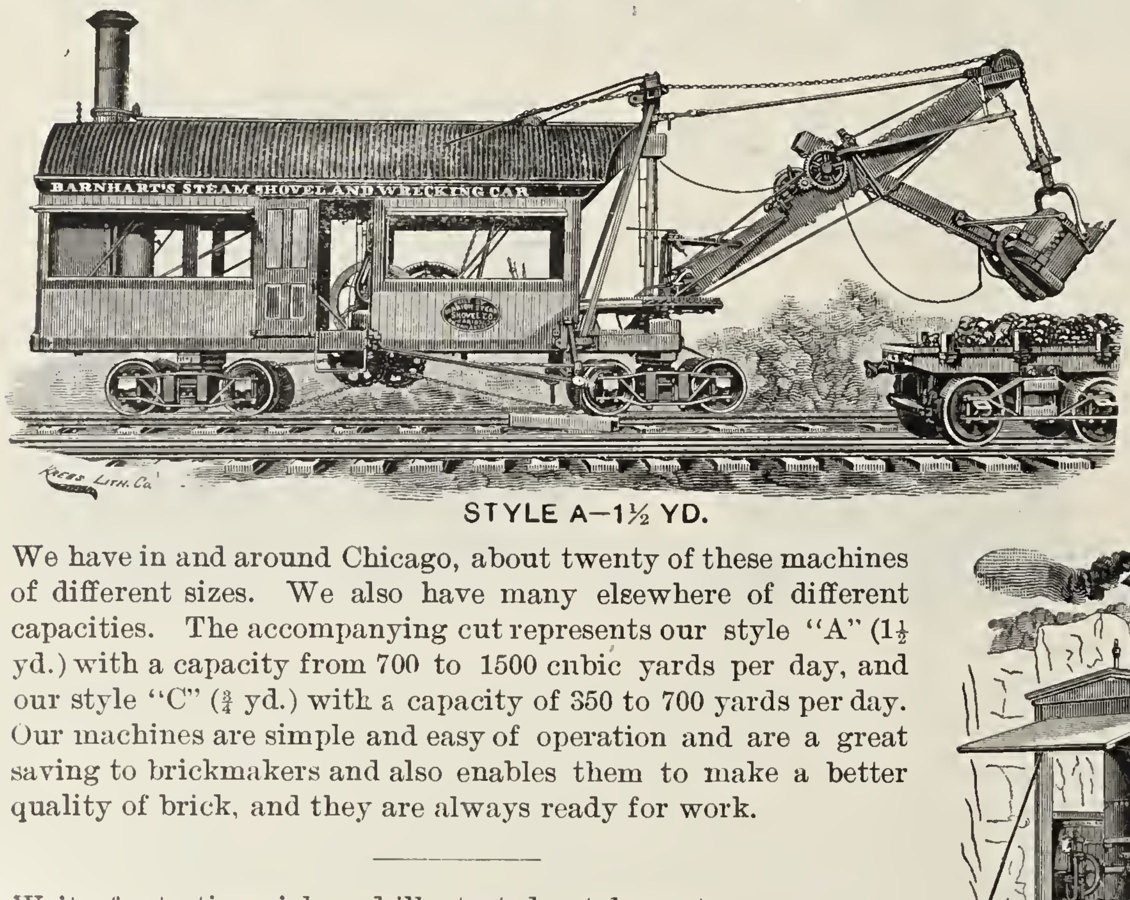
Leader Pug Mill, Size No. 9.

Send for circulars of our **Leader Machinery.**

Brick Machines, Pug Mills, Crushers, Disintegrators, Automatic Cutters, Etc., Etc.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.


BARNHART'S STEAM SHOVEL AND WRECKING CAR
KREBS LITH. CO.

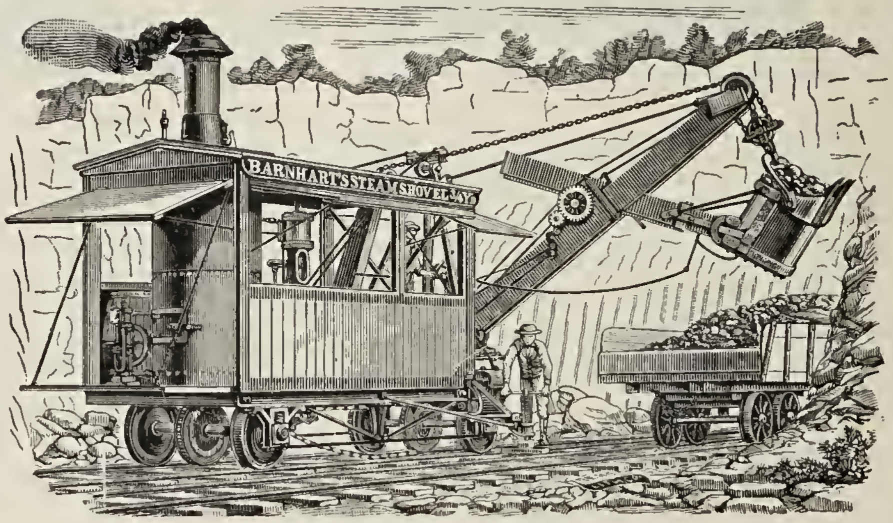
STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

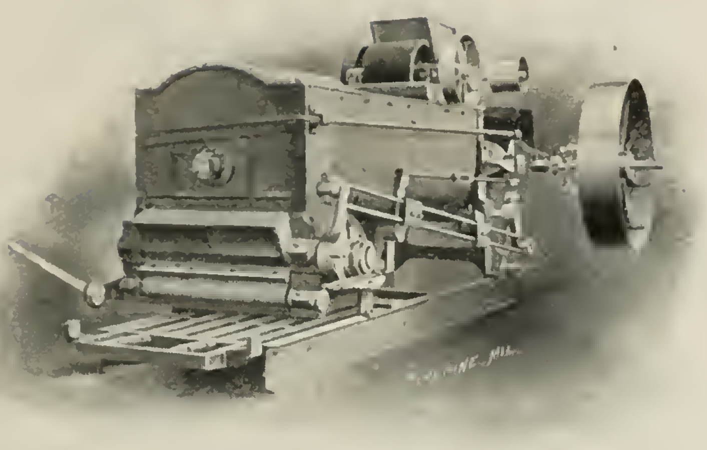
We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,
603 West Center Street, - **MARION, OHIO.**


BARNHART'S STEAM SHOVEL ¾ Y.

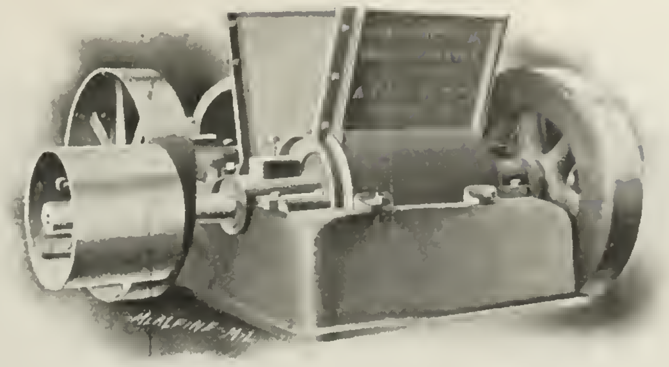
STYLE C—¾ YD.



Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



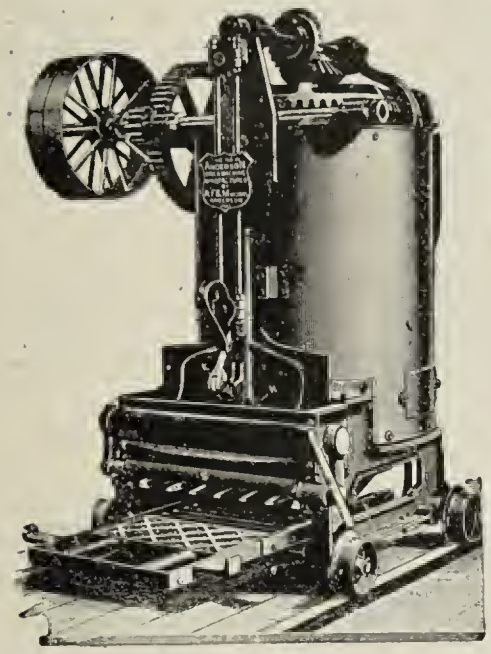
Best Disintegrator on the Market.

MANUFACTURERS OF....

New Departure Tile Machine,

The only machine for making Tile
from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,
And all Brickyard Supplies.



Steel and Iron Upright Stock Brick Machine.

1899 Horse Power Machine.

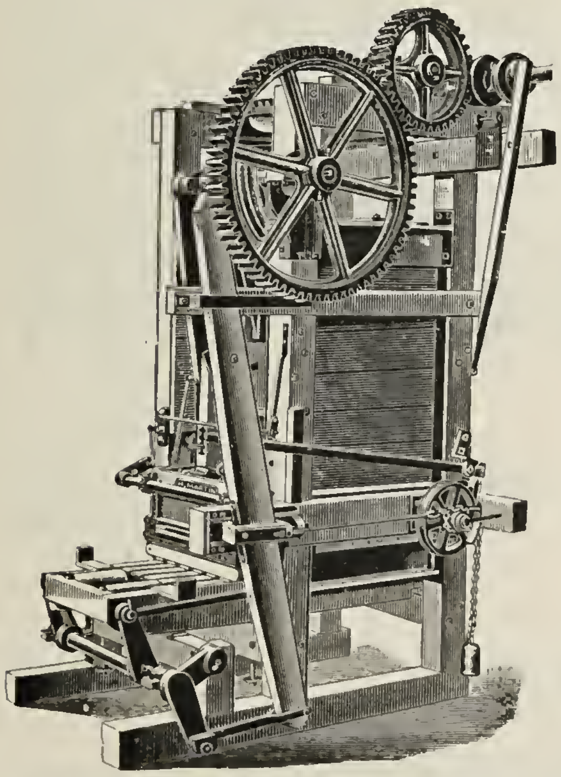
The Anderson Foundry and Machine Works,
Anderson, Ind.

60,000 First Class Soft Mud Brick in 10 Hours

ON A

"MARTIN" STYLE "A" STEAM POWER BRICK MACHINE,

Is the record of one of our Customers in Philadelphia, Pa.



Another in Oregon says:

"Your machine is King of all."

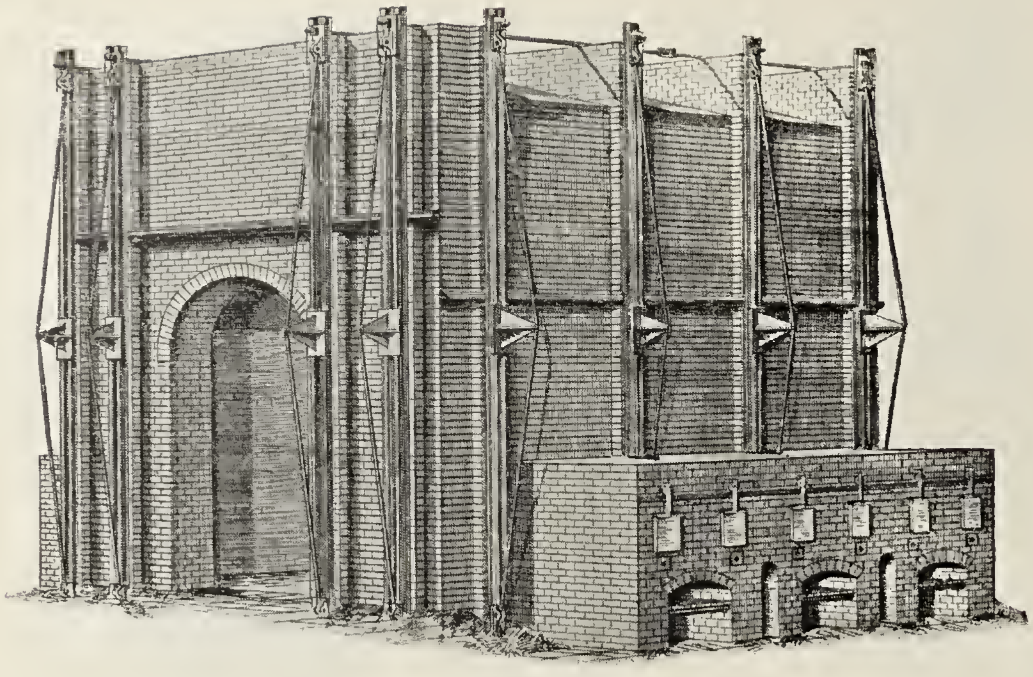
Still another in Nebraska:

"Have just secured a contract for 2,000,000 brick and distanced all competitors; not in price but quality. Thanks to the "Martin."

Many Others are Equally as well Satisfied.

Our catalogue sent on request.

THE HENRY MARTIN BRICK MACHINE MFG. CO., LANCASTER,
PENN., U. S. A.



PATENTED.

The GRATH
IMPROVED...,.
DOWN=DRAFT KILN

With Gas and Coking Furnaces Attached.

This kiln will burn a larger percentage of face, also vitrified brick, than other kiln in the market. The **GRATH KILNS** are in use at the works of the American Hydraulic Press Brick Co., Collinsville, Ill.

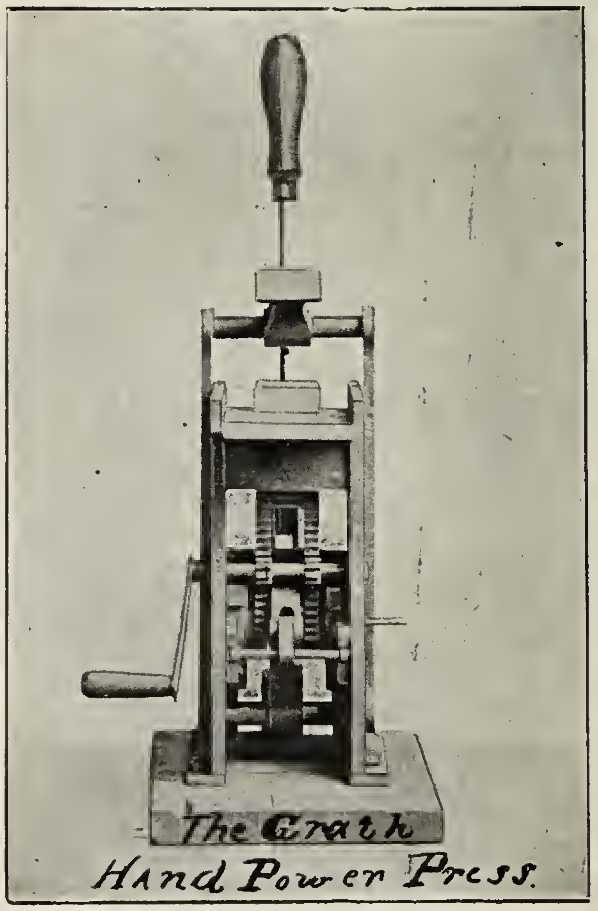
The Grath Gas and Coking Furnace

Is the Simplest, Best and most Durable Coking Furnace in the Market. Can be attached to either **Down** or **Up** Draft kilns and is guaranteed to give satisfactory results.

* * *

The Grath Dry or Semi=Dry Clay Hand=Power Press

For plain or ornamental press brick, The only successful press of its kind in the market. Simple, durable and powerful. No brickyard complete without this press.



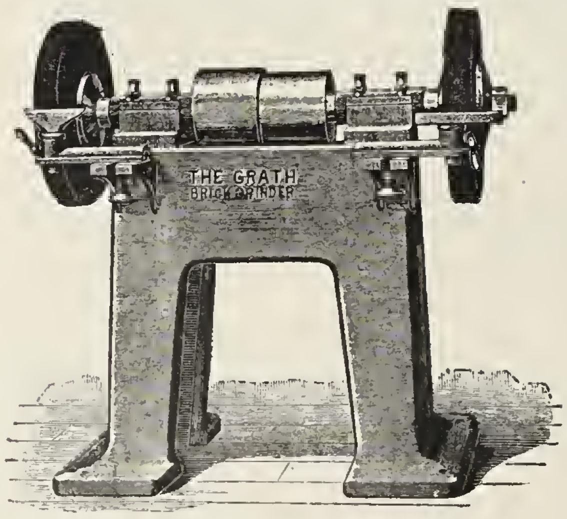
* * *

The Grath Brick Grinding Machine

For grinding Arch and Radius Brick of any hardness, even to a Vitrified brick. Simplest and Best in the market. No sand, no discoloration, which means satisfaction.

The Cheapest Grinding machine in the market.

In use by American Hydraulic Press Brick Co., Collinsville, Ill.



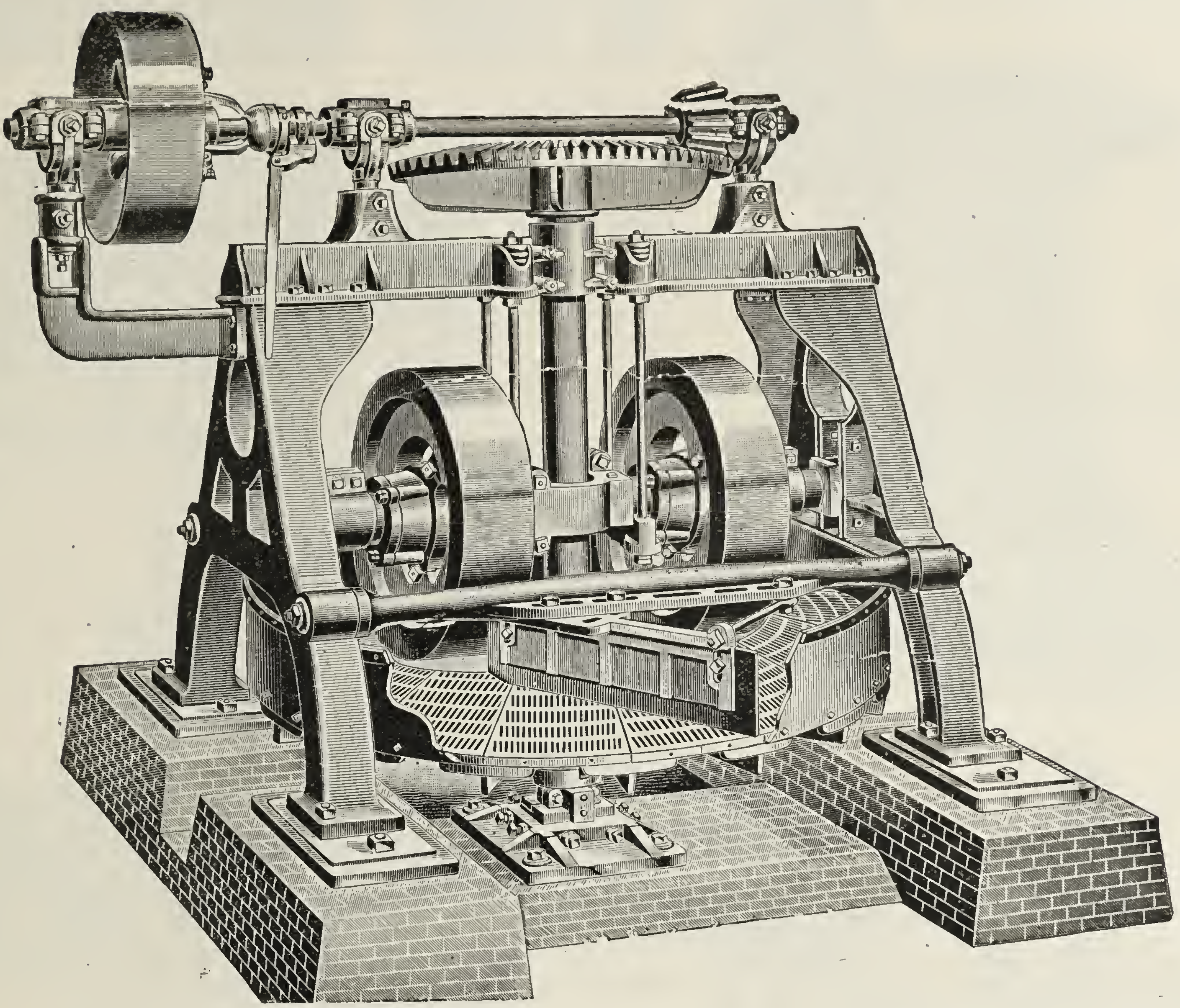
* * *

Simplicity and Durability,
IS OUR MOTTO.

* * *

FOR FURTHER INFORMATION ON ABOVE, ADDRESS

The ILLINOIS SUPPLY & CONSTRUCTION CO.,
St. Louis, Mo.



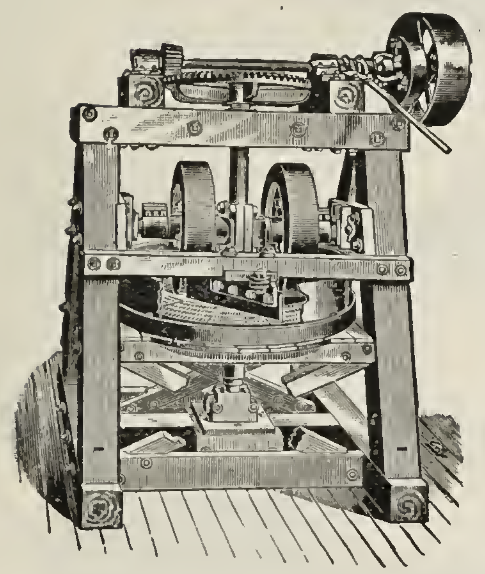
OUR SPECIALTY IS **DRY PANS.**

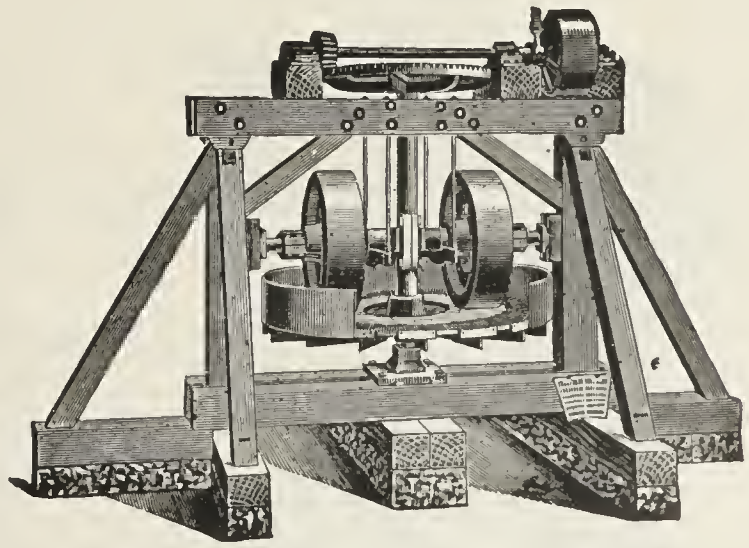
IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.

......SEND FOR NEW ILLUSTRATED CATALOGUE......

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.





We Lead! Others Follow!

• • •

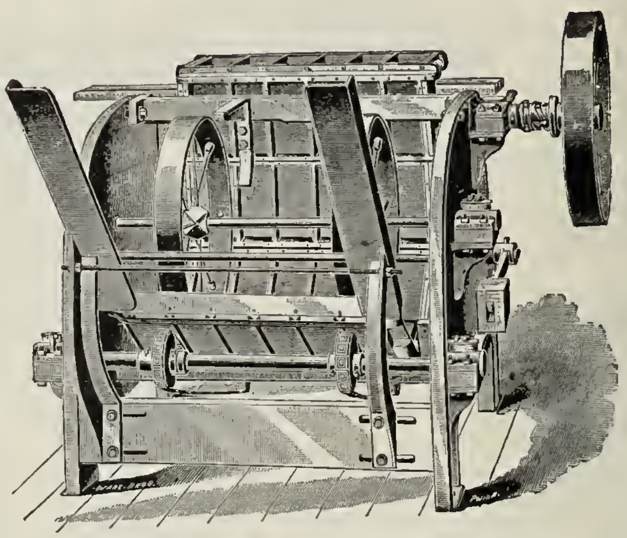
Standard
Heavy
Steam
Power.

The Hercules!

Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

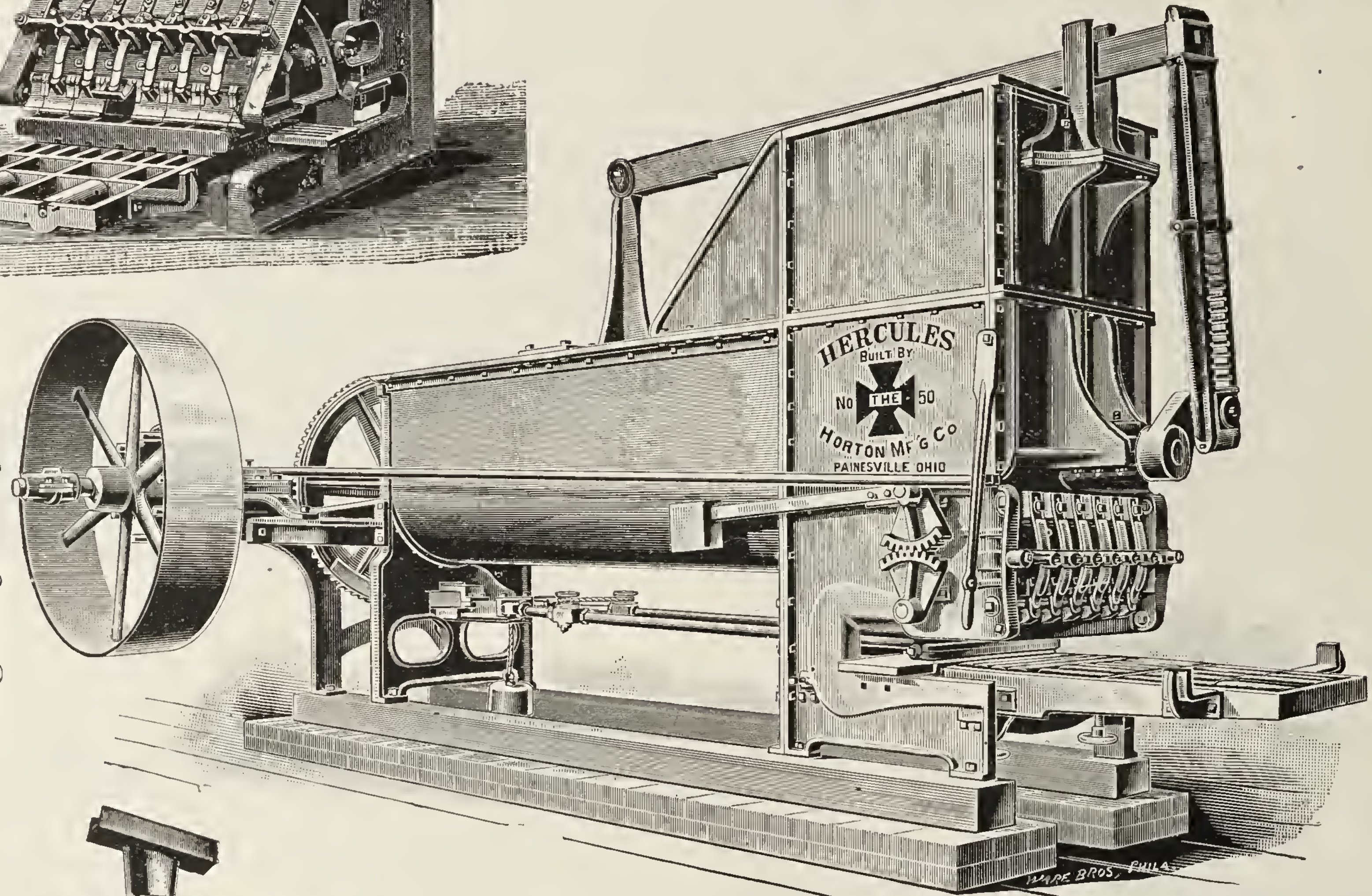
The Standa-d Machine is just what its name implies.

SEND FOR
1899 CATALOGUE.

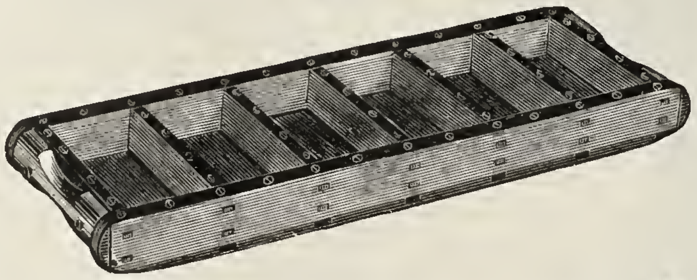


HORTON MOLD SANDER DIRECT FEED.

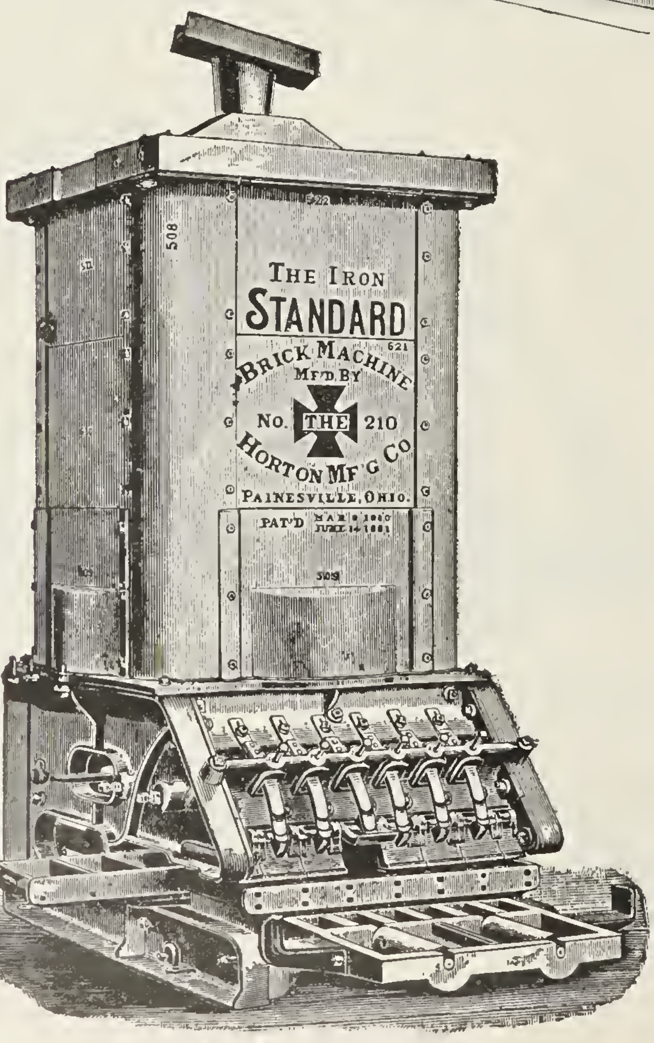
Hercules capacity 40,000
to 50.000.
Weight 15,000 pounds.



We are making a special drive on Molds this season. Send for our new circular on molds



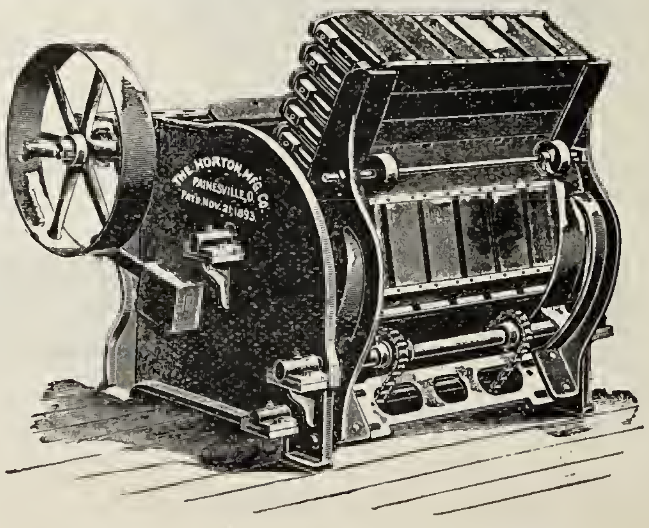
WE HAVE recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.



IRON STANDARD HORSE POWER.

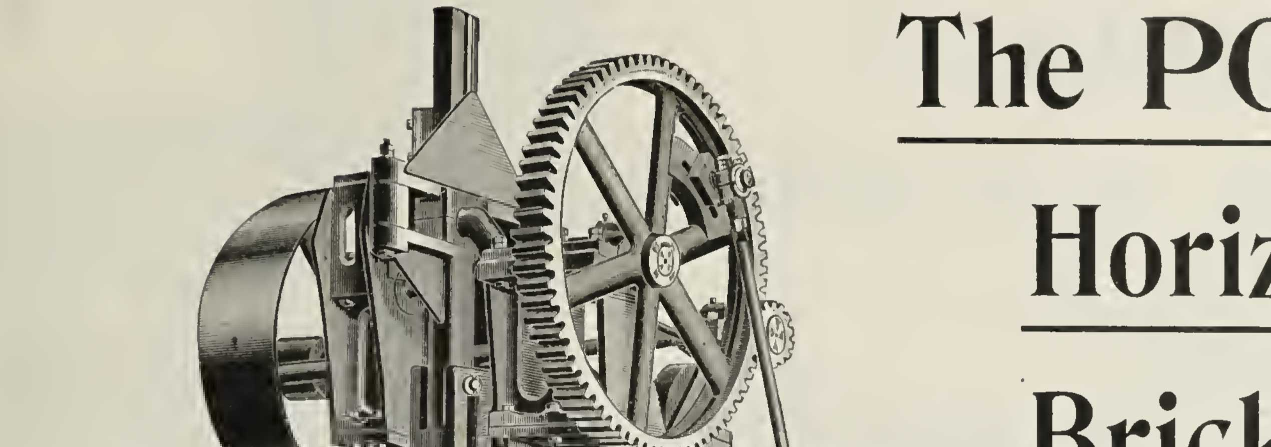
The HORTON
MANUFACTURING
COMPANY,

PAINESVILLE,
OHIO.


THE HORTON MF'G CO.
PAINESVILLE, O.
PAT'D NOV. 21 1893.

THE AUTOMATIC FEED MOLD SANDER.

We make a Specialty of erecting Complete Soft Mud Plants.



The POTTS Horizontal Brick Machines,

DISINTEGRATORS

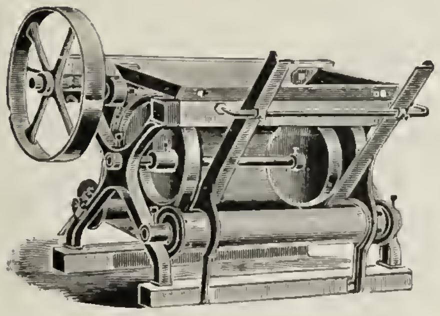
....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

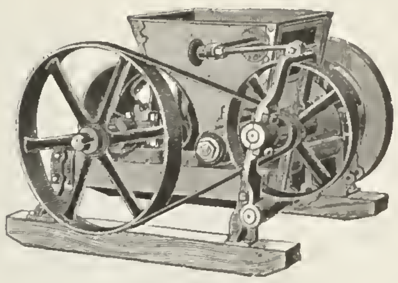
The best built, heaviest and strongest Machinery made.



MOULD SANDERS.

WE MANUFACTURE EVERYTHING NEEDED ON THE BRICKYARD.

WE MAKE A SPECIALTY OF BRICK MOULDS.



DISINTEGRATORS.

When in need of Machinery or supplies, we can save you money.

C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE
JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

The Standard of Excellence.

The evidence of merit is when a customer buys a second time; —we have dozens of this kind of customers.

Did you ever count the cost of a machine that only lasts a few years and then goes into the machinist's hands for continual repairs.

The first Eagle Represses sold a dozen years ago are today in constant use and are doing good service. Scarcely one of them has cost anything for repairs. Ask the users. The Eagle is built of the very best material. No expense is spared to get the finest results. That's why the longer you use them the more profit you make on the money invested in them.

The movement in the Eagle is the ideal one to secure speed, pressure, and insure life. No vibration. No elasticity. No wear.

We make no preposterous claims but fulfill every promise and more. We give all the speed that can be utilized and more product of a better quality than any other press in the same number of hours. Look up the records and convince yourself.

It is the easiest to operate because of simplicity.

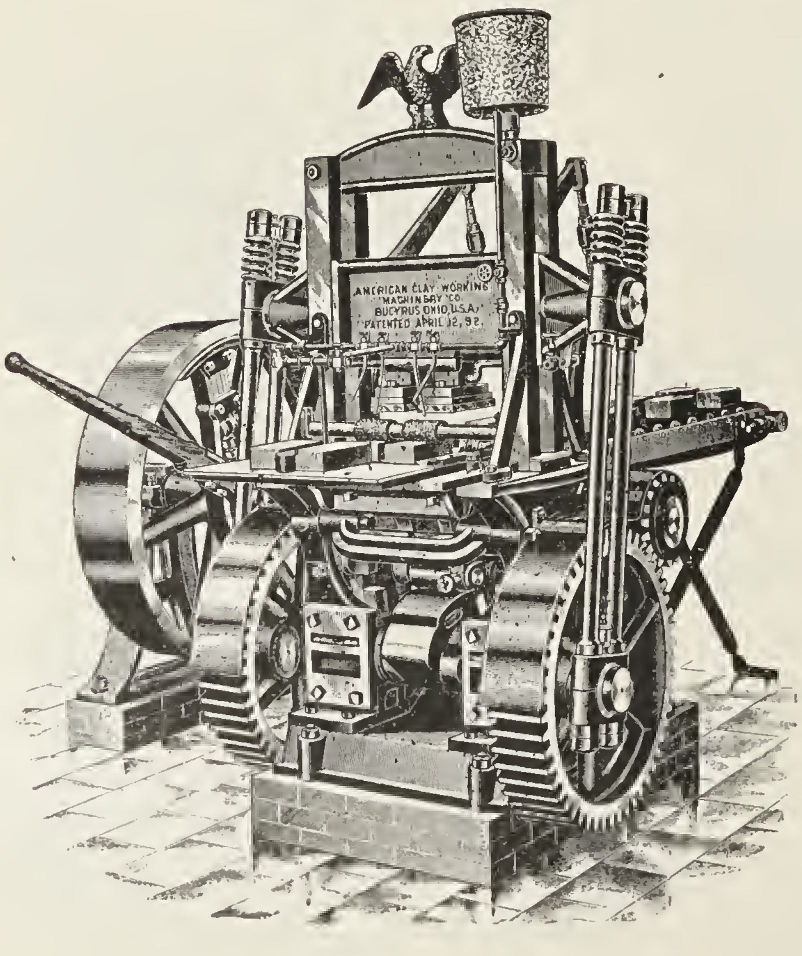
It gives more and better product because of its rigidity.

It has more life because of its correct and superior movement and faultless construction.

It is cheapest because it lasts the longest.

It costs very little to investigate the merits of this press, and it may save you much in expense and worry.

Send us a postal and we'll deliver full particulars free of charge. If you want to buy at once, we'll send a man.

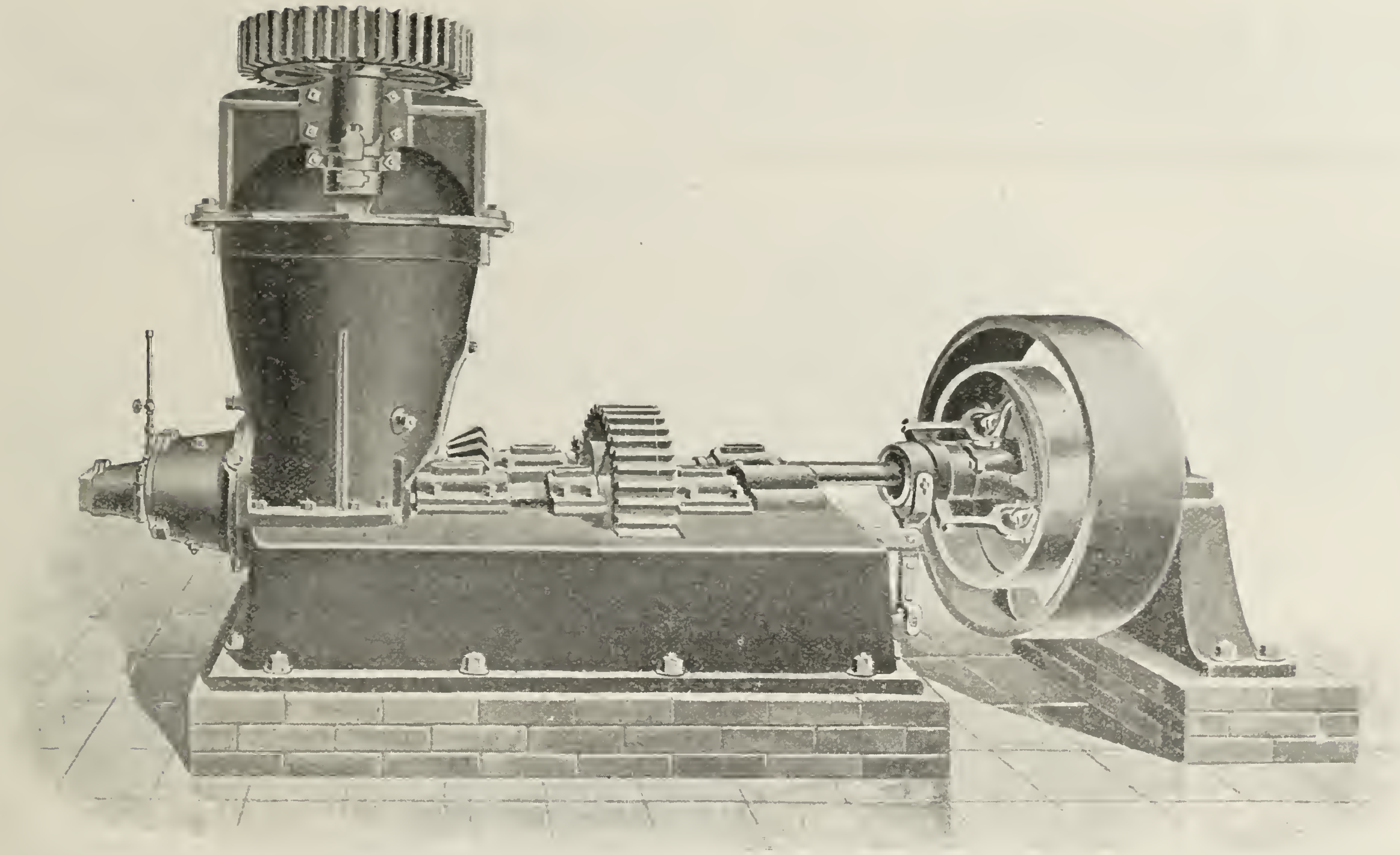

AMERICAN CLAY-WORKING MACHINERY CO.
BUCYRUS OHIO U.S.A.
PATENTED APRIL 12, 92.

We build a full line of machinery for the manufacture of all classes of clay products and we build them right.

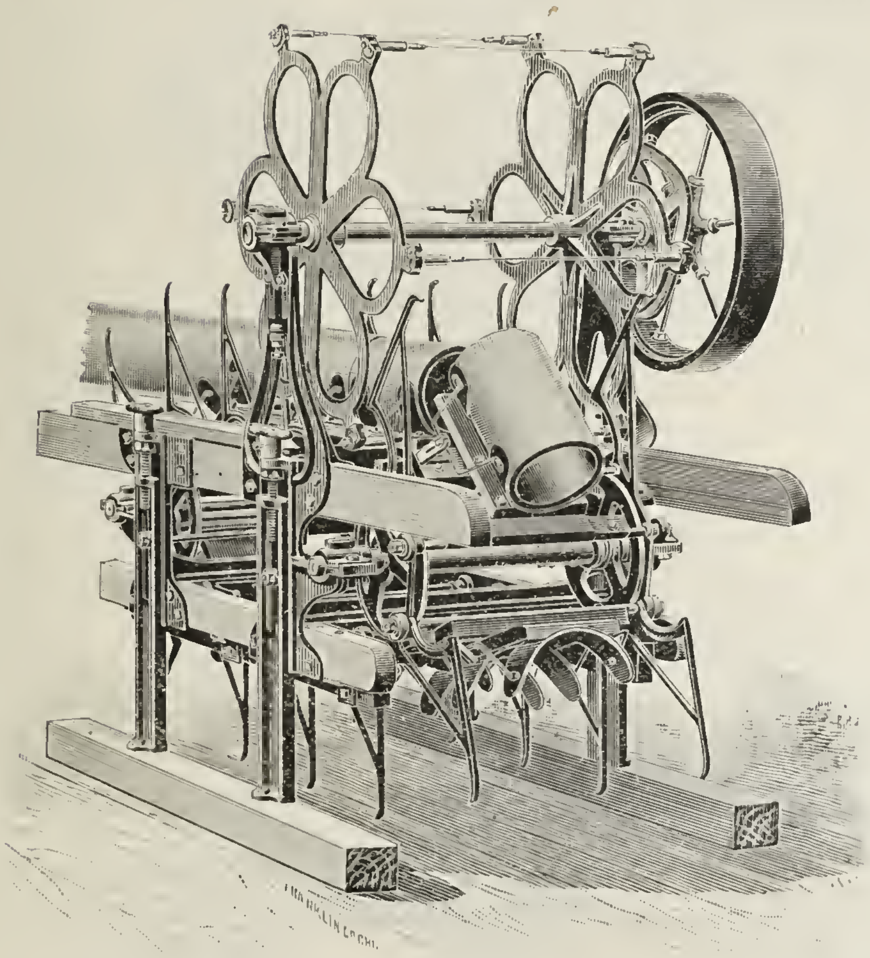
The American Clay-Working Machinery Co.,

THE MACHINERY THAT NEVER DISAPPOINTS

BUCYRUS, OHIO, U. S. A.



Brewer No. 10. Daily capacity 50,000 to 80,000 Brick.



Automatic Tile Cutter.

Naperville, Ill., Jan. 24, 1898.

H. BREWER & CO., Tecumseh, Mich.:

Dear Sirs—In answer to your inquiry, it gives us great pleasure to say that your Automatic Tile Cutter we bought about one year ago, along with the No. 9 A machine, is ALL RIGHT, just as you represented it. With it we have been able to put from 15,000 to 18,000 three-inch tile on the floor in 10 hours. The tile are cut true; very few have to be thrown back. There is no doubling up of tile in the troughs when clay runs a little softer than it ought to be; the little belt which drives the reel prevents this and helps to keep the troughs moving. The pressure on the cutting wires being always in the same direction, makes them last a long time. Clay can also be run quite soft and the tile retain their perfect form. We think your Automatic Tile Cutter is nearly perfection. We are well satisfied with it and could not think now of running our works again without it. Wishing you much success, we remain

Yours truly,

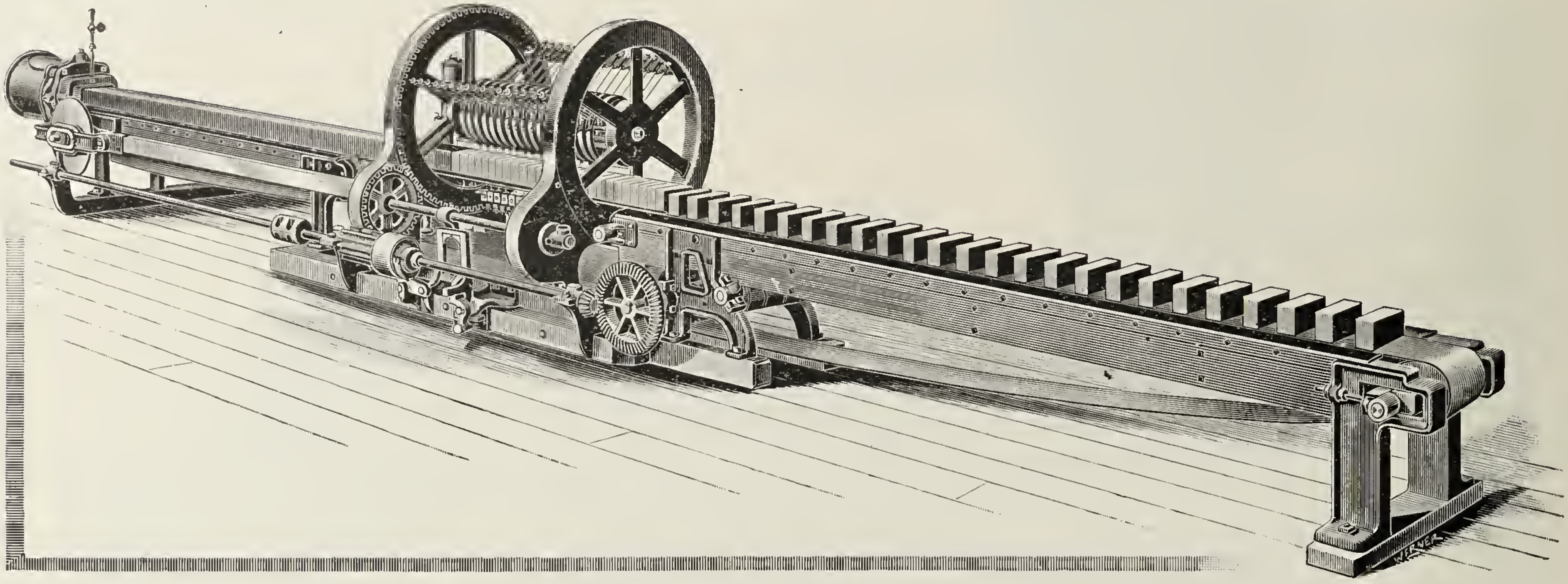
MARTIN & VONOVEN.

H. BREWER & CO.,

Tecumseh, Mich.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



A New Rotating Cutter for Side Cut Brick.

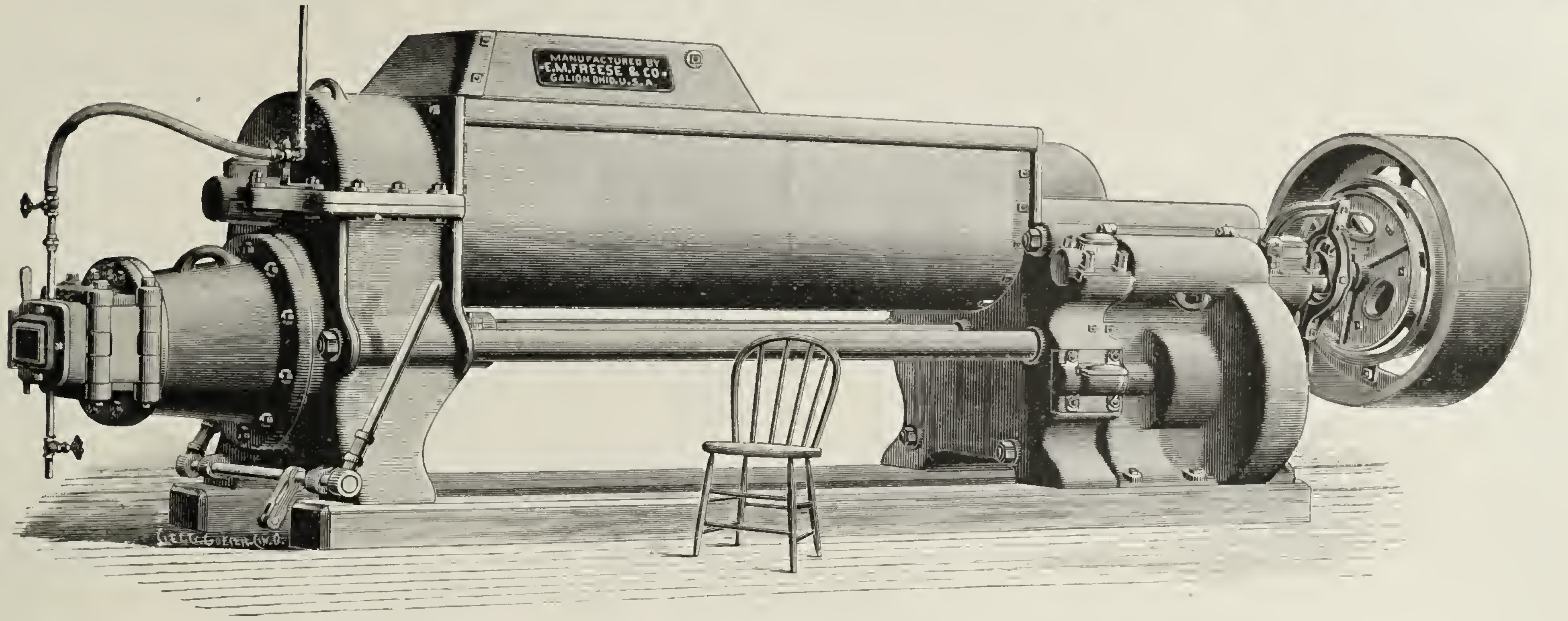
POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

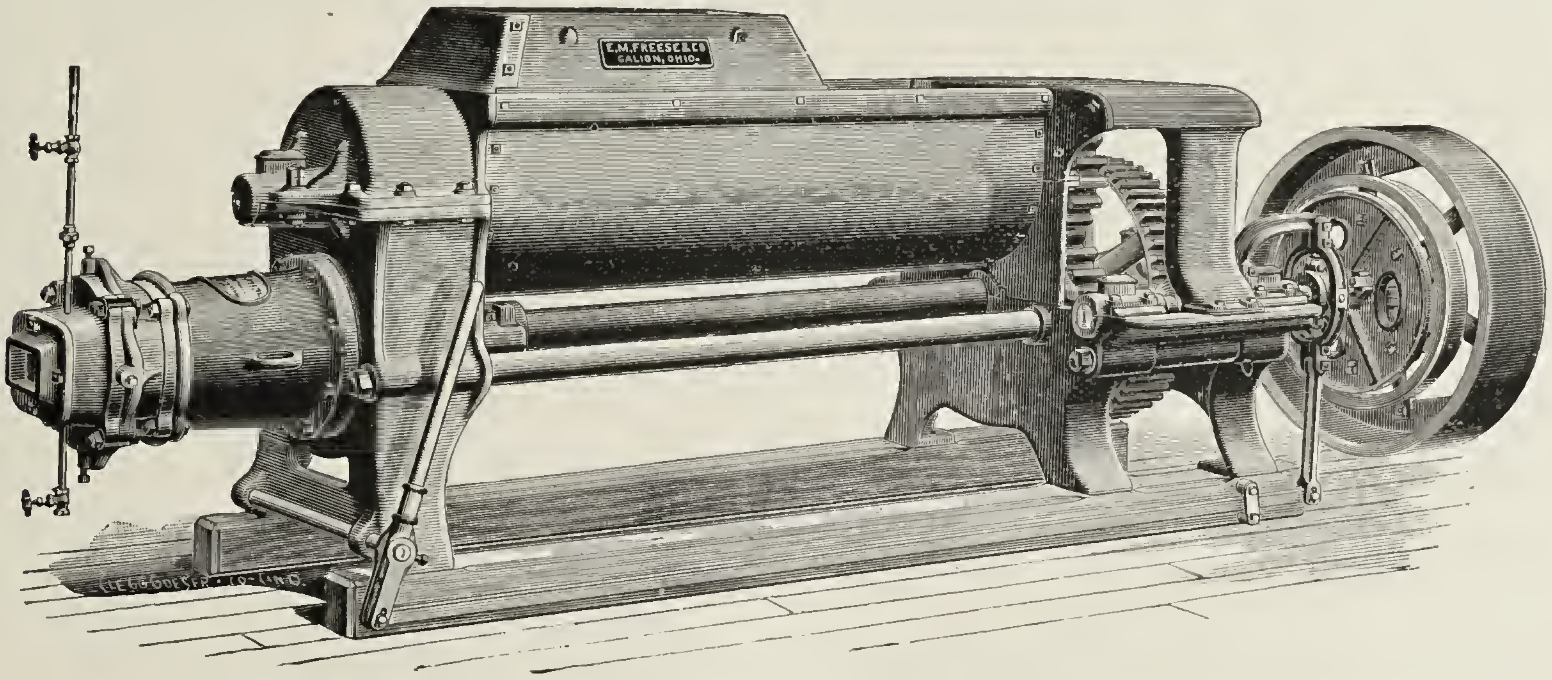
E. M. FREESE & CO.,

Galion, Ohio.

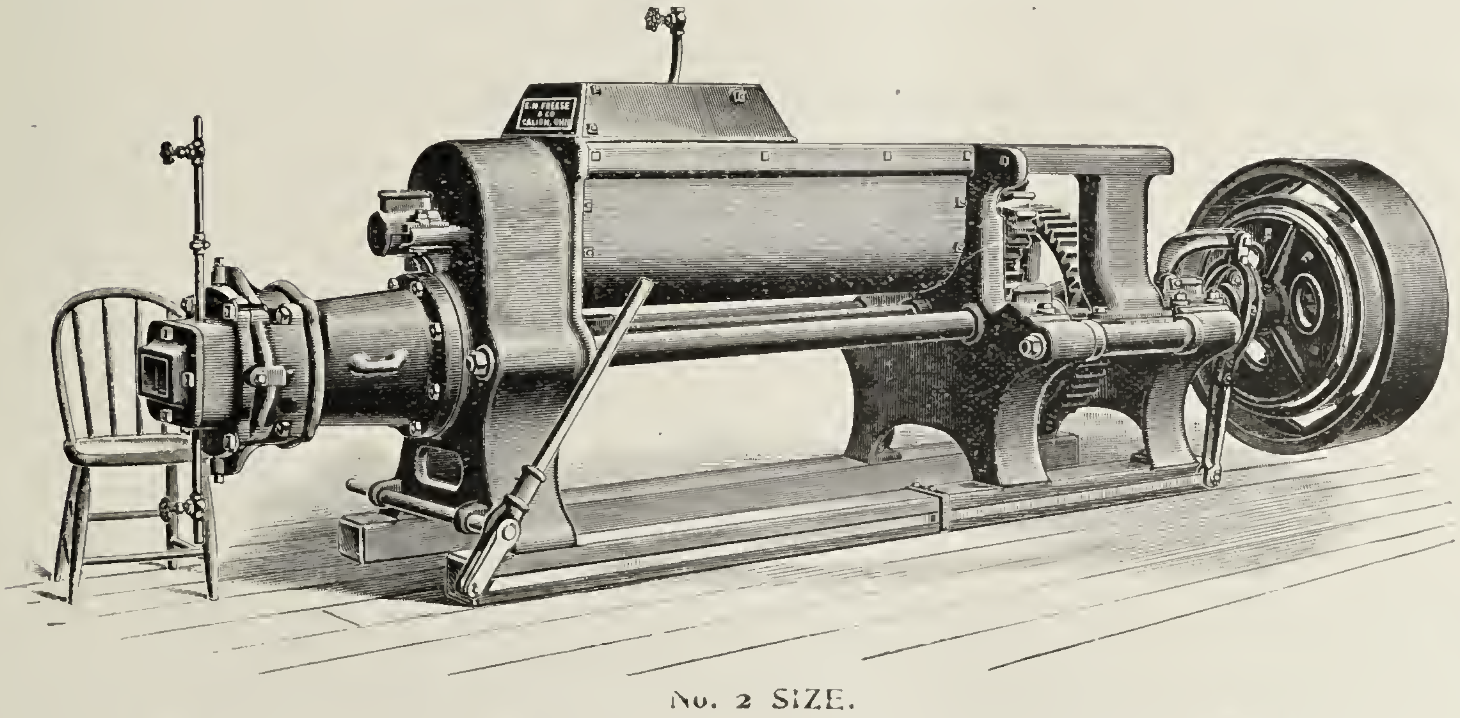
The Original Union Brick Machines


MANUFACTURED BY
E.M. FREESE & CO.
GALION OHIO, U.S.A.

SPECIAL SIZE.
Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.
Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

No. 2 SIZE.
Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

"New Haven" Brick Machines

Are at This Time the

Leading Soft Clay Brick Machines of America.

SIMPLY BY REASON OF THEIR GREAT STRENGTH, THOROUGH CONSTRUCTION, SIMPLE DESIGN and EFFICIENCY.

DON'T YOU THINK it's about the right time to find out if the above statement is true.

Come and see the machines we are building or go and see those in use.

A list of some brickmakers having our machinery in use may be had for the asking.

INVESTIGATE AND YOU WILL BUY OF

The Eastern Machinery Co.,

NEW HAVEN, CONN.

DO YOU WANT THE

BEST BRICK DRYER?

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel. It is a fuel saver and hence a money maker.

If you want the best and most economical brick dryer don't fail to get our prices. If you want a cheap dryer, its no use to write us for we don't build that kind.

◆

Read what H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE: 60TH AND HAVERFORD STS. TELEPHONE 147, W. P.
H. C. CARROLL & SONS,
Brick Manufacturers,
Residence, 3831 Lancaster Avenue.
3 YARDS: 57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

◆

The Cummer Clay Dryer is now in successful operation at many places in the United States. Like our brick dryer it is fully guaranteed to perform its work in the most effective manner possible and in any desired capacity. The **Cummer Dryer** succeeds where others fail. It will afford us pleasure to demonstrate its superiority over all other dryers.

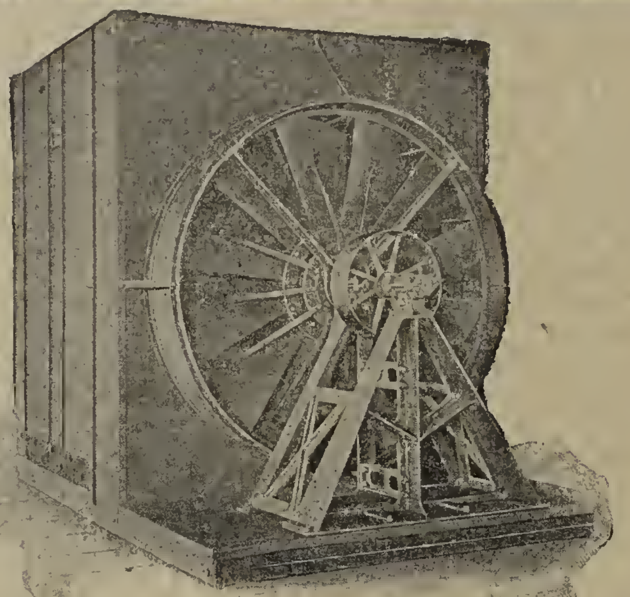
IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell you troubles to"

The F. D. CUMMER & SON CO.,

CLEVELAND, OHIO.

The "A. B. C."

BRICK DRYER.



ECONOMICAL EFFICIENT EXPEDITIOUS Drying.

American Blower Company.
DETROIT, MICH.

The Peerless System

UP-DRAFT, DOWN-DRAFT and CONTINUOUS Kilns

Is the Acme of Perfection in Brick Burning.

READ WHAT THEY SAY ABOUT IT:

LaPrairie Pressed Brick and Terra Cotta Co., Quebec:
"We have been using two of these rebuilt Kilns for the last two years, and the fact that we are now reconstructing another, demonstrates our Entire Satisfaction with your PEERLESS SYSTEM.

Elmsdale Brick Co., N. S.:
"Never saw a Kiln work so even and free both in watersmoking and burning in all my life. The arches were as good as any other part of the Kiln."

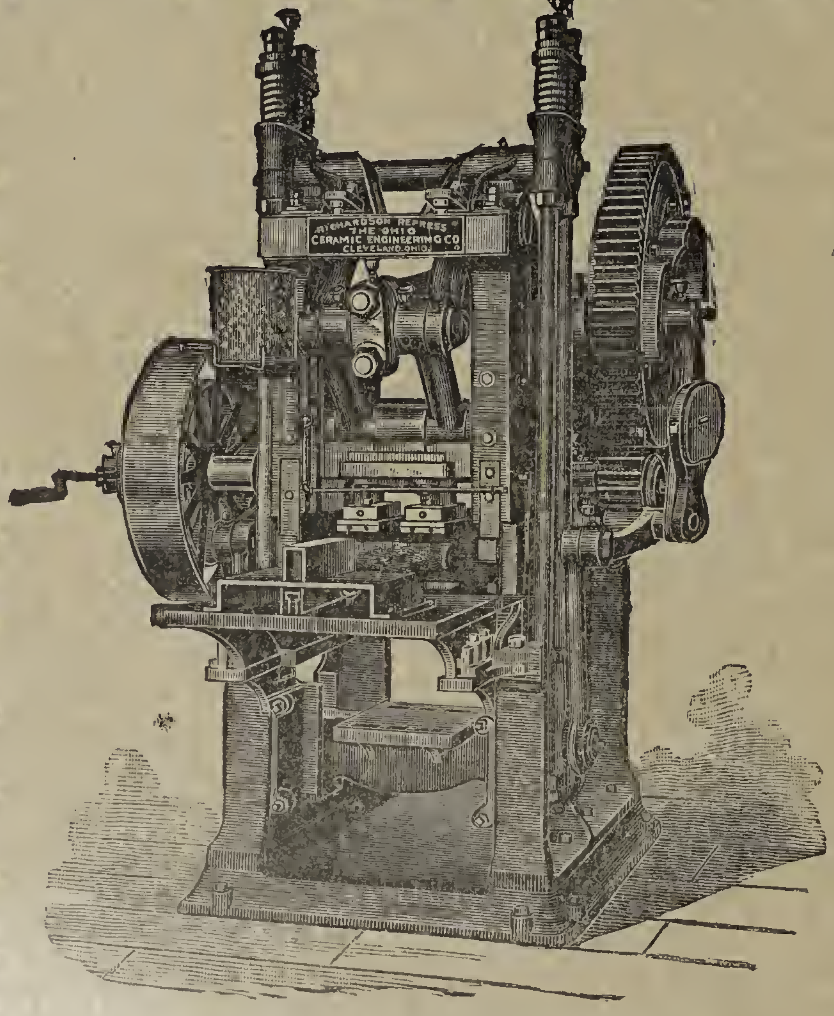
John Cubbins Sons, Memphis, Tenn.:
"After burning the first kiln that was changed, the second time, we found the improvement so great and so much Superior to the old up-draft kilns, that we are now changing our entire system to your PEERLESS PATENT."

Jacob Kline, Baltimore, Md.:
"Your system of burning good hard brick is without doubt the best I have ever seen."

And there are Others.

No matter what you manufacture, or the capacity of your plant, if your make is of clay and you want it burned, write us for information. If you have kilns that are not giving satisfaction, or from any other cause you cannot burn your ware, write and tell us all you know about the trouble.

J. W. CARSON, Construction Engineer of Brick Works.
Montezuma, Ind.



THE RICHARDSON REPRESS.

RESULTS

That's what you want
your Brick Machinery
to produce.

WE BUILD THAT KIND.

SEND FOR CATALOGUE.

The OHIO CERAMIC
ENGINEERING COMPANY,
.... Cleveland, Ohio.

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THE CLAY WORKER
A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS.
INCLUDING BRICK TILE TERRA-COTTA SEWER PIPE POTTERY ETC.
T. A. RANDALL & CO. PUBLISHERS.
CHANDLER SC. INDPLS

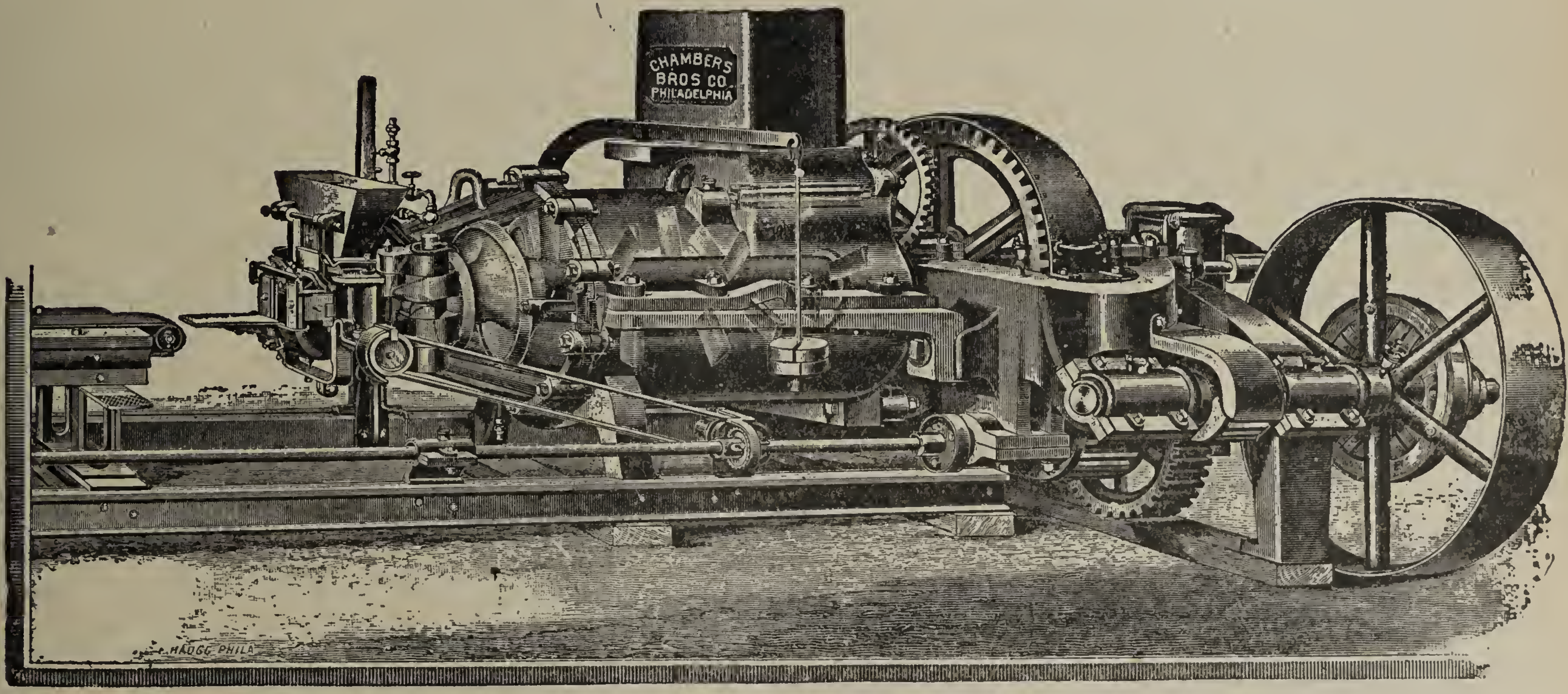
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXII, No. 4. INDIANAPOLIS, IND., OCTOBER, 1899. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

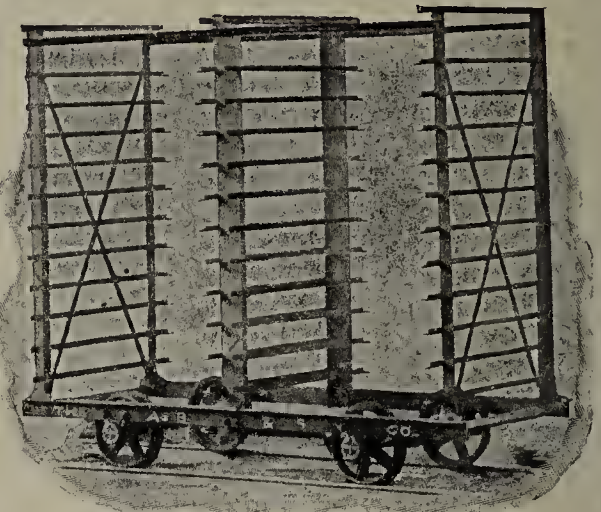
PHILADELPHIA, PA.

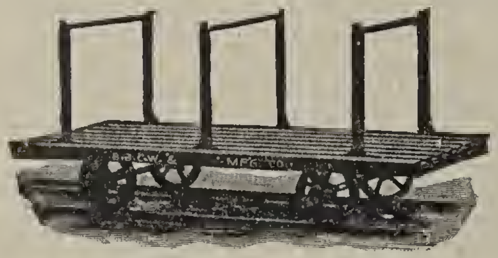
The Atlas Bolt & Screw Co.,
Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.

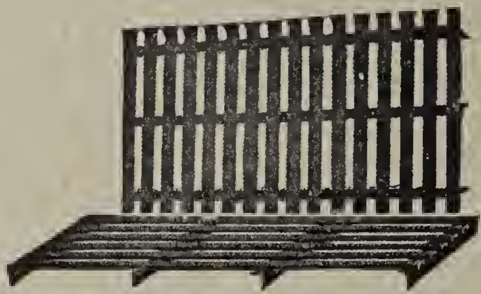




No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.

No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

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WHEN WRITING TO ADVERTISERS
Mention the Clay-Worker

THE HARRINGTON AND KING PERFORATING CO.
CHICAGO, ILL.
THE H.&K.P.CO.
PERFORATED SHEET STEEL
FOR
CLAY SCREENS
SEWER PIPE
BRICK.
TERRA-COTTA
FOR CHUTE SCREENS.
FOR DRY PAN SCREENS.
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The MONARCH

Is an All Iron and Steel Brick Machine with

Double Pug Mill.

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SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

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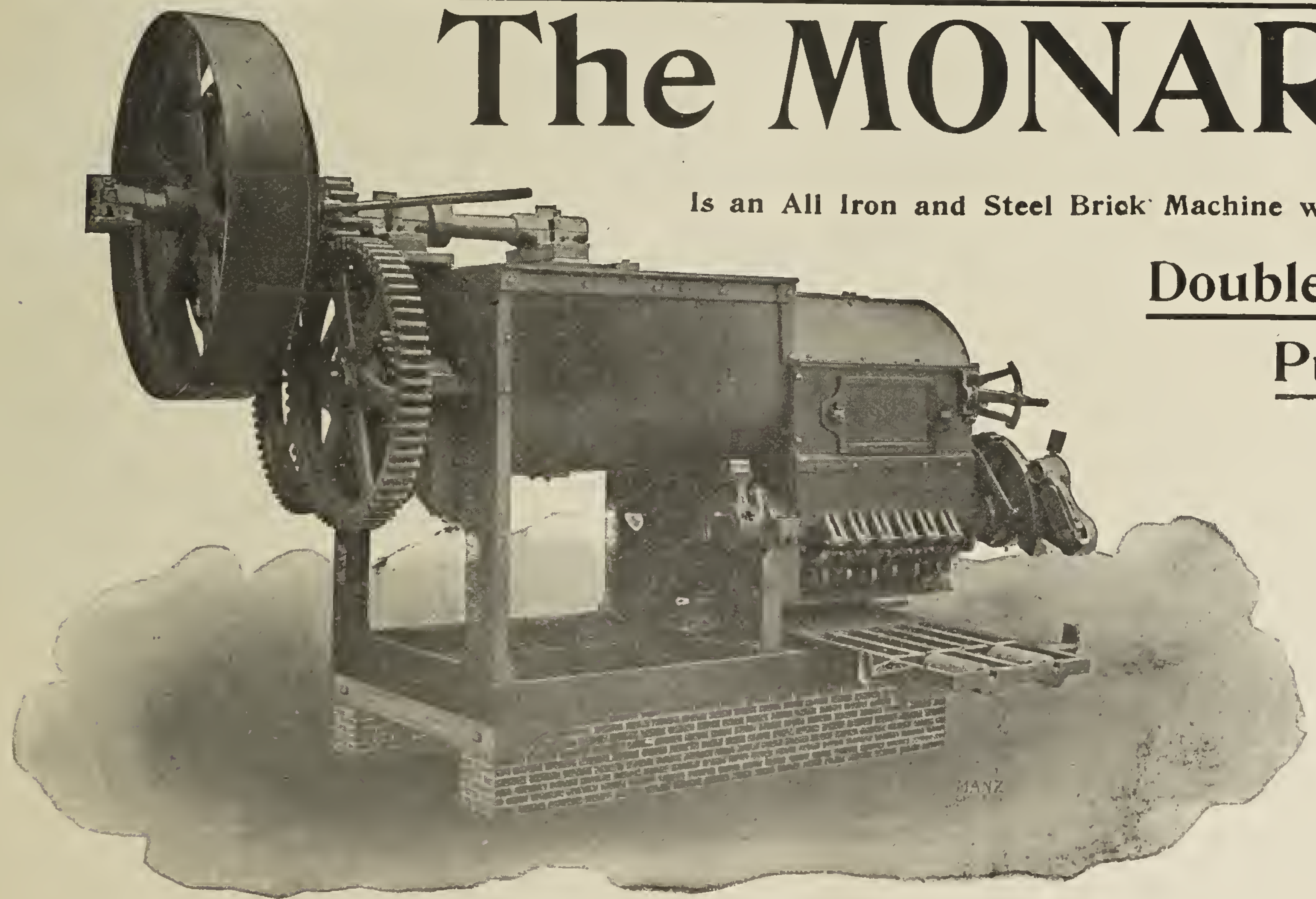


Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for 1899 Catalogue.

JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.

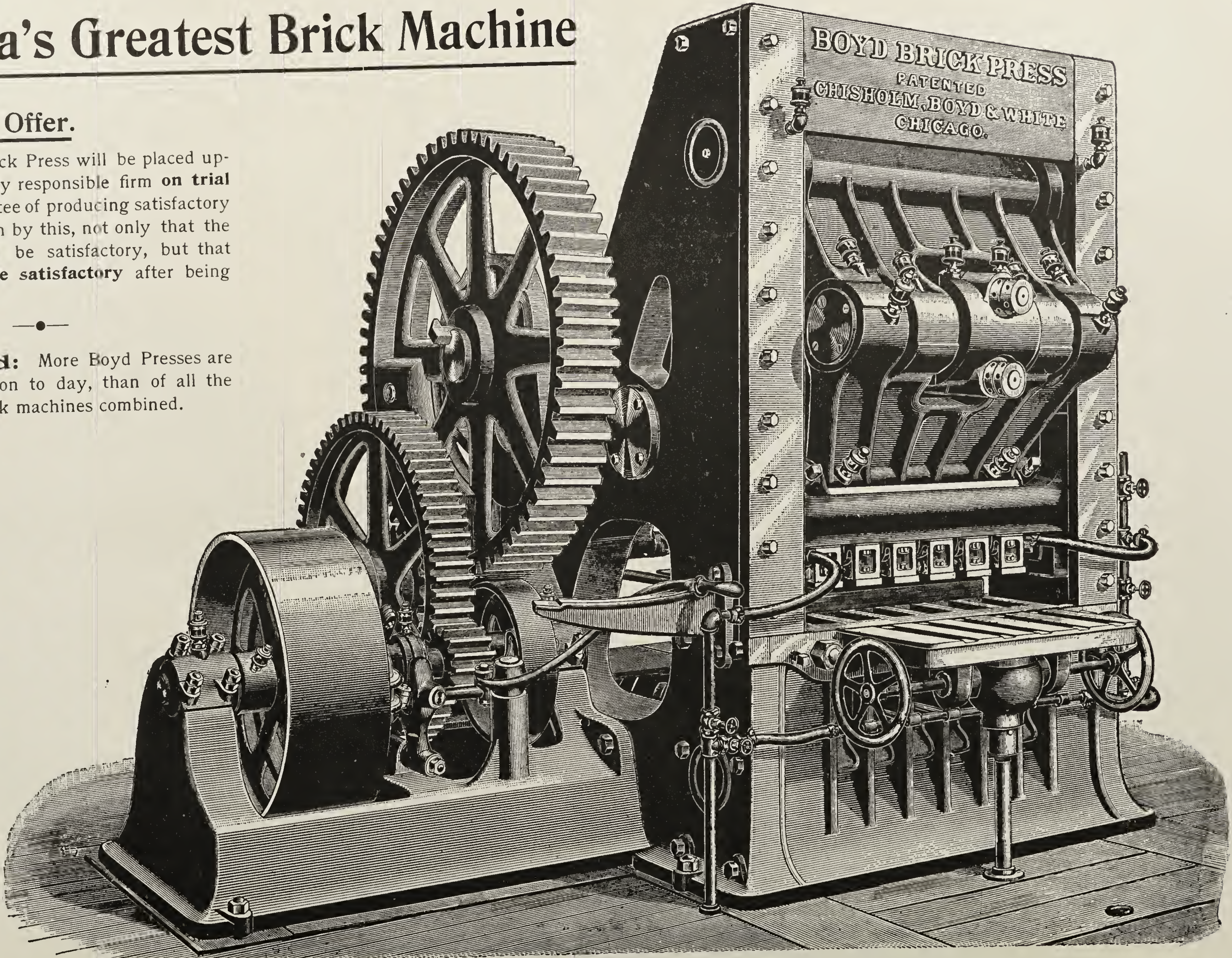
America's Greatest Brick Machine

A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

—•—

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

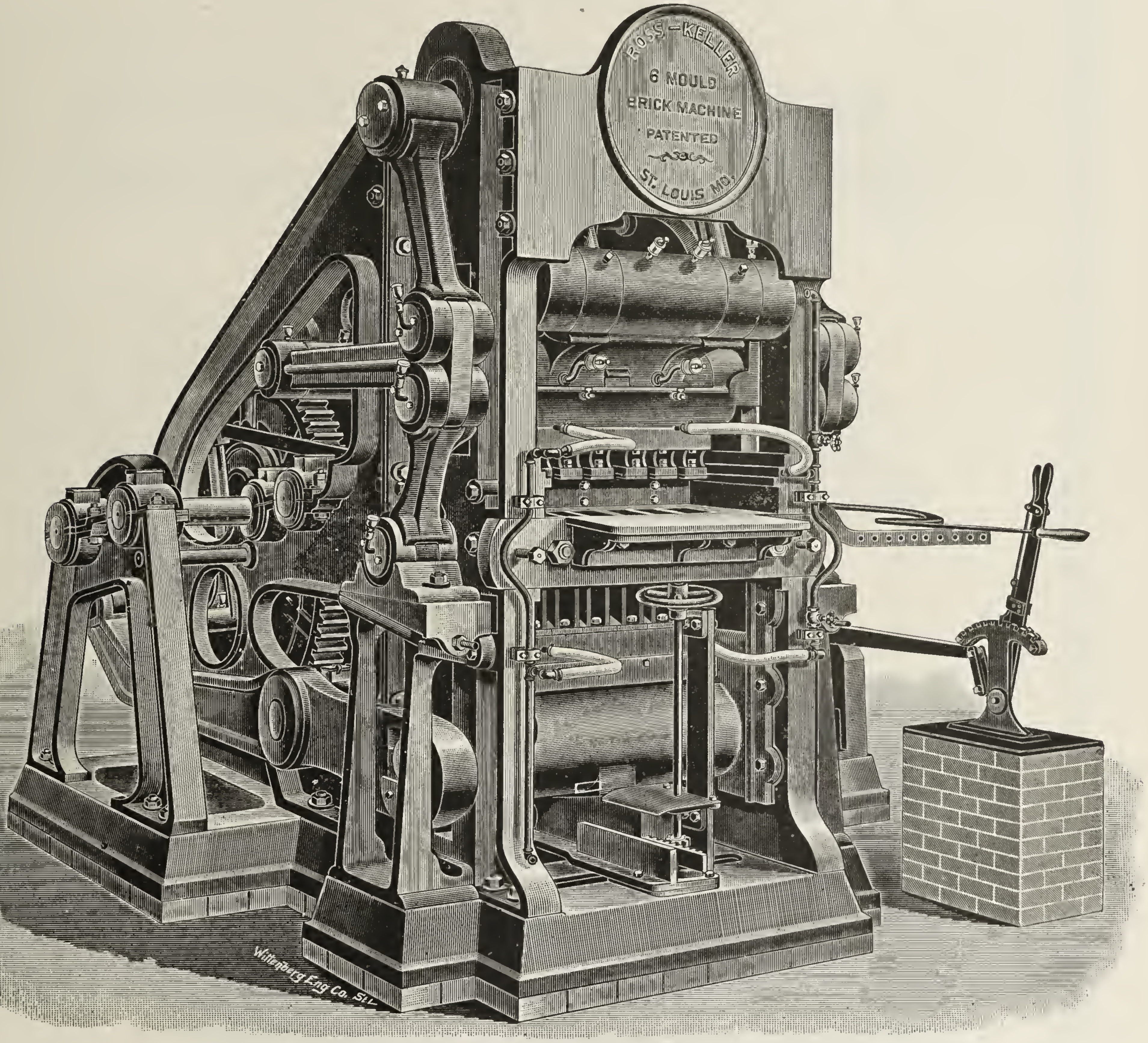
CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The Latest Improved

Ross-Keller TRIPLE-PRESSURE **Brick Machine.**

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

BRICK SET IN KILN DIRECT FROM MACHINE.



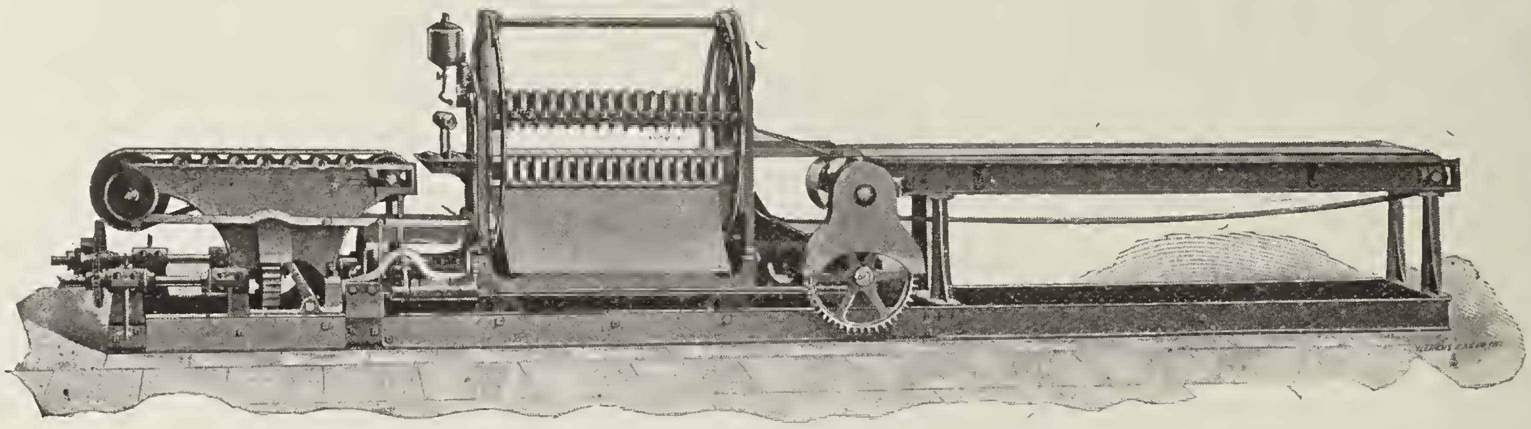
The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made. Press is guaranteed for two years against breakage.

If you want the best come and see us, or write for price and full particulars, address

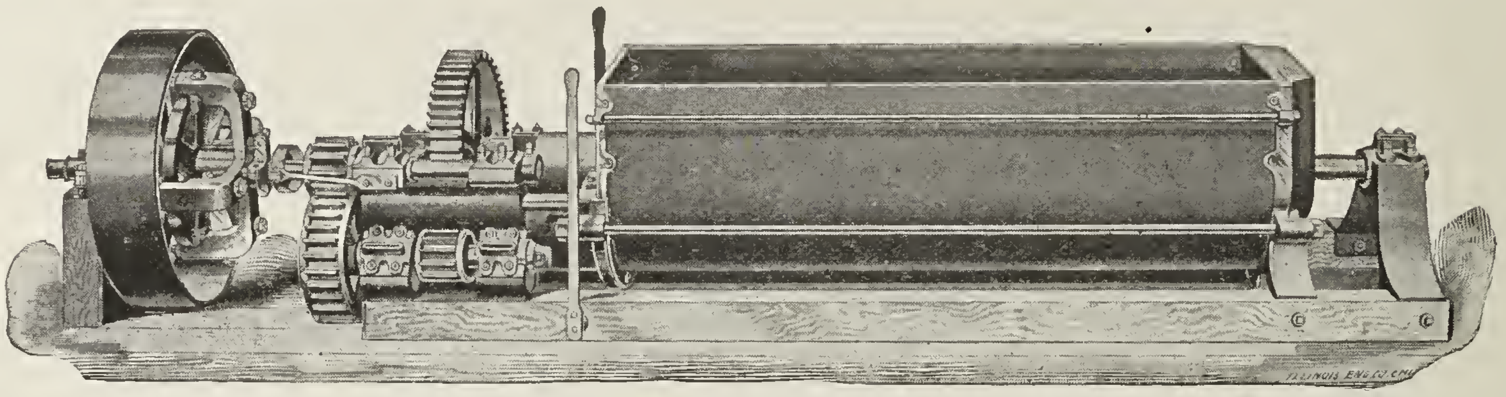
Ross-Keller Brick Machine Company,

915 Holland Building, **ST. LOUIS, MO., U. S. A.**

The Wonder Clay-



Cunningham's Improved Combination End and Side Cut Automatic Brick Cutter.


ILLINOIS ENG. CO. CHI.

Open Top Pug Mills of any size and capacity desired.

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WONDER BRICK AND TILE MACHINES WILL WORK ANY CLAY THAT IS ADAPTED TO THE STIFF CLAY PROCESS.

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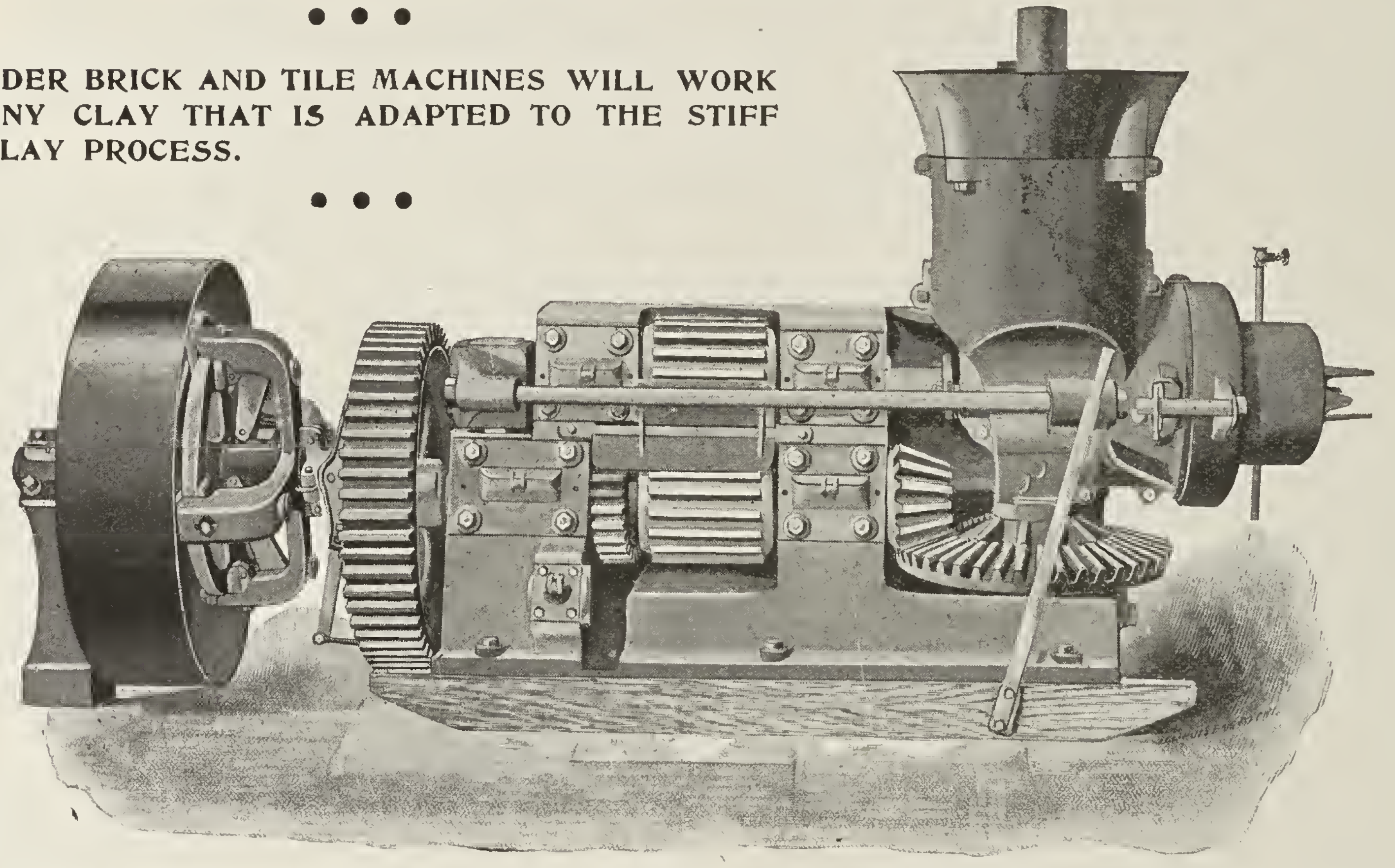
If you Want the Best Brick and Tile Machinery, Don't Fail to get Our Prices.



Wonder Brick Machines, made in four sizes, with capacity ranging from 20,000 to 100,000 brick per day.

THE WALLACE

CHICAGO AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

Working Machinery

The Battle Ship Oregon was not built by the oldest and largest Ship Building Works in the World, but she was a record breaker for low cost for repairs. So with the **Wonder Brick Machines** as the following letter testifies. This is the second Season this machine has been run.

GRAND RAPIDS, MICH., July 22, 1899

THE WALLACE MFG. CO.,
Frankfort, Ind.

Gentlemen:—Will you please send us by freight the two knives that fit on the horizontal shaft, Big Wonder, as the old ones are badly worn. Also send us your catalogue price list.

We are making 50,000 brick per day regularly on the Big Wonder. Have not started up any of our other machines this season, as the one machine fills our yard completely, which holds as you know 500,000 brick, requiring two gangs of wheelers and setters. We have never broken so much as a bolt, closed down the machine a minute for readjustment, or paid out one dollar for repairs since starting. We wish you abundant success.

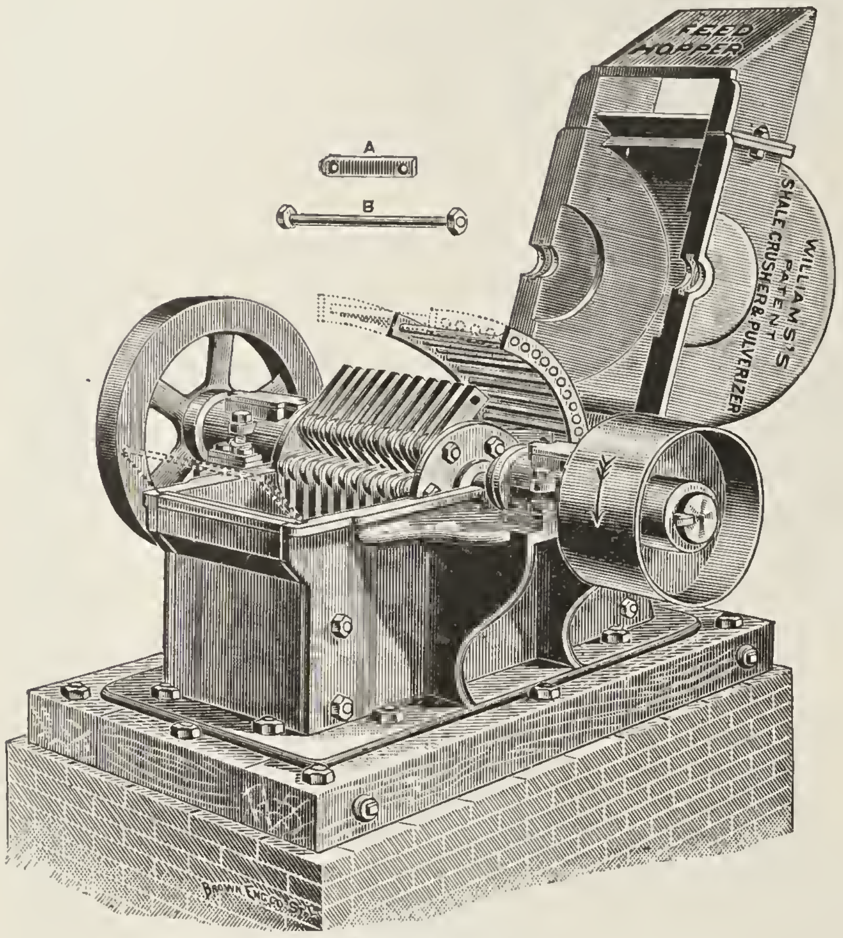
Very respectfully yours,
GRAND RAPIDS CONSOLIDATED BRICK & TILING CO.

You will find seven **Wonder Brick Machines** in Grand Rapids and vacinity.

MANUFACTURING CO.,
Frankfort, Indiana.

The WILLIAMS PATENT CRUSHER & PULVERIZER Co.,

of St. Louis, Mo., U. S. A.


FEED HOPPER
WILLIAMS'S PATENT SHALE CRUSHER & PULVERIZER
A
B

Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

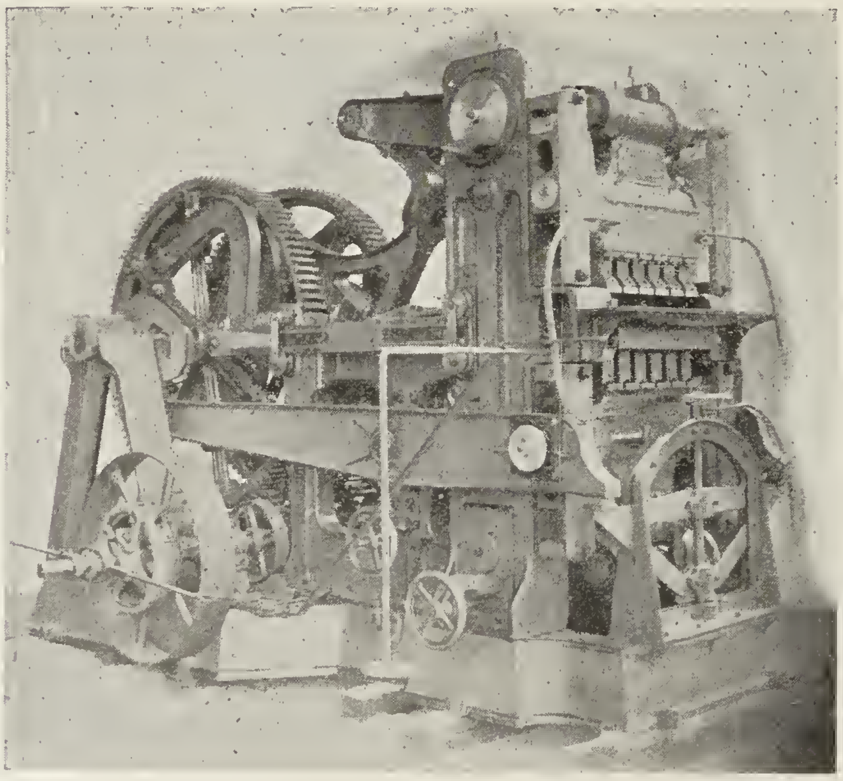
FOR FURTHER INFORMATION WRITE TO

**The Williams Patent
Crusher and
Pulverizer Company,**
2701, 2703, 2705 and 2707 North Broadway,
ST. LOUIS, MO., U. S. A.

Branch Offices:
NEW YORK OFFICE: Washington Life Bldg.
PHILADELPHIA OFFICE: Stephen Girard Bldg.
WEST VIRGINIA OFFICE: Bramwell.
LOUISVILLE OFFICE: 1301 West Main Street.

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for STRENGTH, DURABILITY and SIMPLICITY.

The lightest running Press in the market, requiring only 6 to 7 horse power to operate the largest 6-mold press. All parts subject to strain are made of the best bessemer steel, and can be seen and gotten at easily. The thickness of the brick can be changed and regulated without stopping the press, and every press is fitted with the Fernholtz mold, which is admitted to be the best in use. For fine pressed and ornamental brick, this machine cannot be equalled, the pressure on, and movement of the clay in the mold being such as to prevent granulation, and insures the most perfect product possible. We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer,** and the **Fernholtz Clay Mixer** in our own factory and guarantee them fully.

The opinion of those using our press and full information on application.

The Fernholtz Brick Machinery Co.,

1214 and 1216 Poplar Street, ST. LOUIS, MO.

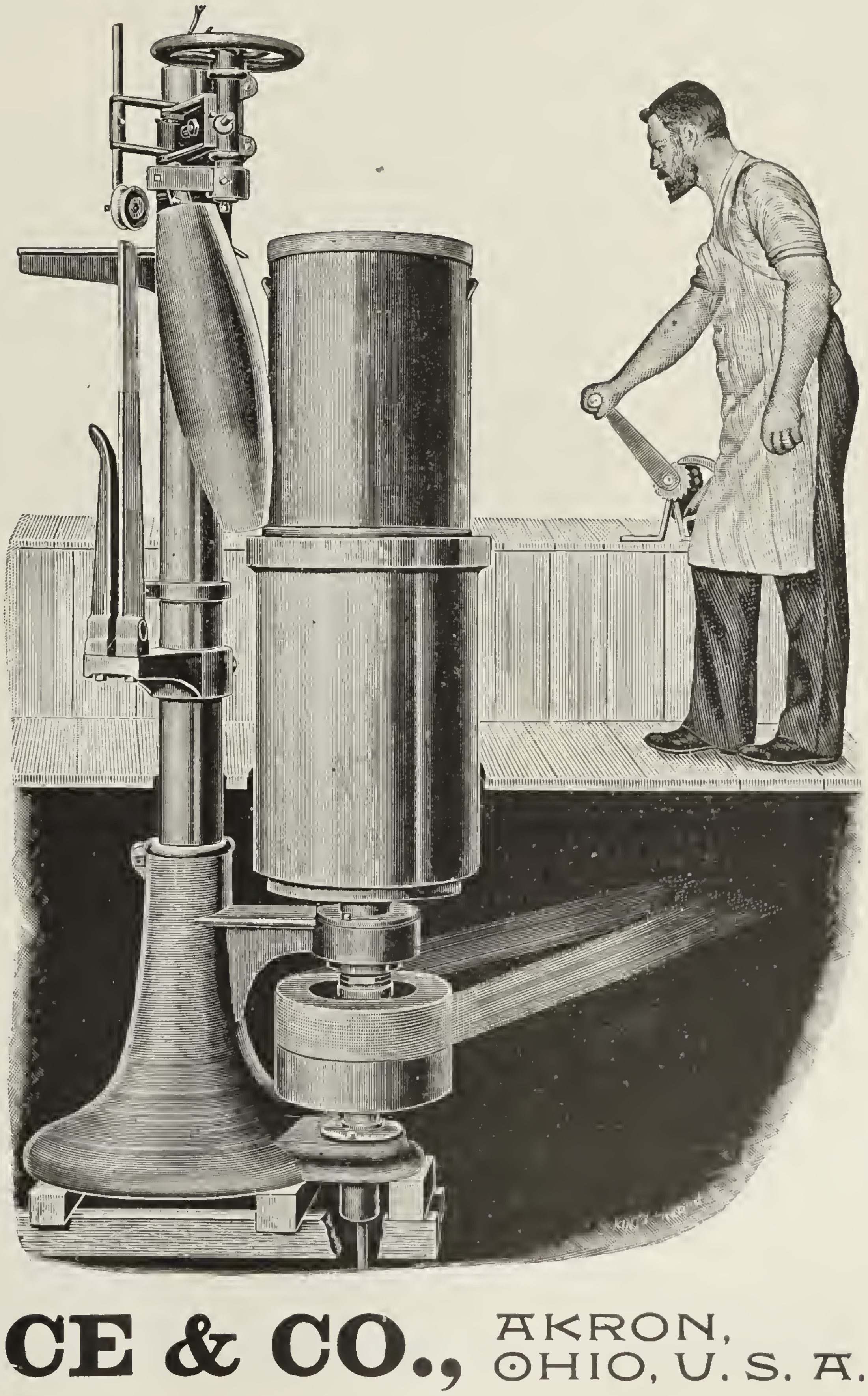
The BEST

Large Pottery Ware MACHINE ON EARTH.

RANGE 6 TO 60 GALLONS.
80—30 GALLON TUBS MADE IN 10 HOURS.

ALWAYS IN ADVANCE
READY TO MEET YOUR REQUIREMENTS

Our Reputation for
Superior Machinery
AND
Fair Dealing
IS WELL
Established
....AND....
Will be Maintained.



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CUTS and DESCRIPTION
...OF...

POTTERY,
SEWER PIPE AND
DRAIN TILE
MACHINERY.

TAPLIN, RICE & CO., AKRON,
OHIO, U. S. A.

The Standard Drier

FOR BRICK AND TILE.

We are very much pleased with your Drier—it does even better than you guaranteed.

This is very gratifying to us as our first experience with Driers was very discouraging; in fact, a failure both as to drying and handling our material. The great mistake we made was in considering a proposition from and awarding the contract to a party who made us a lower price than yours, on our first Drier. In buying the second time we did not consider a bid from the first builder at all. Now we see the difference. There is no comparison between the two Driers, neither in equipment, workmanship or system.

Respectfully,
ENSLEY BRICK CO.,
Ensley, Ala. *H. L. Finkler, Sec'y.*

EVIDENCE OF SUPERIORITY.

Hundreds of Testimonials. Ask for them.

Ensley Brick Co., Ensley, Ala.

ADDITIONAL PROOF.

What others say is What Counts. Ask for Catalog. It tells all about THE STANDARD DRIER.

Gentlemen:—The Steam Drier you put in our plant has been in use one year, it has been subjected to trying tests. Beginning in the Winter with the clay wet and sloppy, and the shale full of frost, our soft mud brick entered the dry house cold and clammy. Under the scientific yet common sense method of distributing the heat and nature's own way of carrying off the moisture, our brick came from the Drier, sound and thoroughly dried and free from checks or fracture. We dry our soft mud shale brick in 24 hours and our brick made from clay in 48 hours. The Drier is easily controlled, in fact it runs itself with no expense so far, for repairs or renewals; all that is required is steam sufficient to keep the temperature at 120 degrees at the receiving end, and about 165 degrees at the discharging end.

The cars we purchased of you are the best and most practical we have seen. In fact the Drier with its outfit is to us an agreeable surprise, in the matter of durability, practical use and expense on account of repairs.

Yours very truly,
THE ADAMS BRICK CO.,
Indianapolis, Ind. *J. C. Adams, Pres't.*

The Standard Dry Kiln Co.,

186 South Meridian Street. ***INDIANAPOLIS, IND.***

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXII. INDIANAPOLIS, IND., OCTOBER, 1899. No. 4

Written for the CLAY-WORKER.

THE CLAYWORKER IN SOUTH AFRICA.

Johannesburg's Building Interests—Oom Paul's Domain Rich in Minerals, But Devoid of Building Timber—Brick and Iron Houses take the Place of Primitive Dwellings.

BY AN AMERICAN ENGINEER.

IN COMPARISON with other countries, South Africa has very little to show as to the activity and work of former generations. The main evidence consists in extensive surface workings on gold quartz veins of the present Mashonaland and Matabeleland. The work was done by strangers, merely in quest for gold. No inscription was left to show who those gold diggers were, and as to what became of them. A few remnants of broken implements and pottery was all that was left, besides the ruins of some small forts. If those diggings were placed in a continuous line they would, according to the statement of the American mining engineer, Mr. John Hays Hammond, extend for about 300 miles. The gold, no doubt, had to be conveyed to the coast, shipped to Arabia and from there by caravans northward, until at one time some hordes of savages burst upon them, wiped them out and put an end to the gold digging unto the present time.

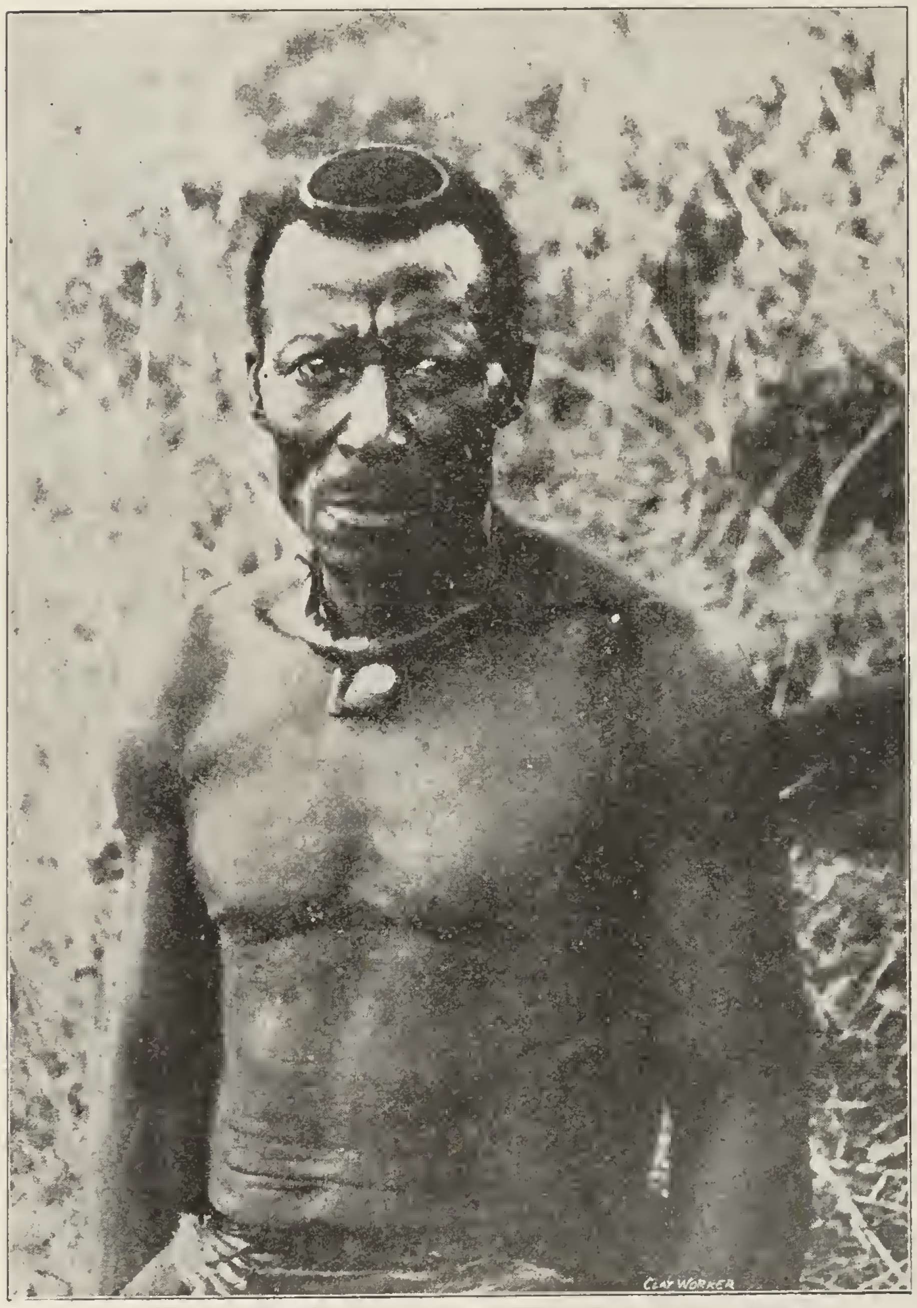
TELEPHONE EXCHANGE, JOHANNESBURG, R. S. A.

The ruins of Zymbabwe, in Mashonaland, are the largest and best preserved ones; they are built of brick; evidently they had not suffered by the depredations of men, and no doubt none of the nations inhabiting those parts of Africa has either made brick or learned the use of them. The brick are of a peculiar make, and as the same kind and size of brick has been found in the ruins of Phoenicia and Mexico (in this latter country are many more evidences of a far advanced Phoenician colony), it is supposed that the Phoenicians, who worked silver mines in Mexico, mines for silver and copper in Spain, for tin in England, etc., had mined and carried away the gold from Southeast Africa.

The natives of South Africa have nothing but huts to dwell in. The new settlers outside of established towns live in huts, most of the population of the new Rhodesia build with native help the round huts they live in from wicker-work, besmeared and plastered over with mud, and with a thatched roof, and the stylish ones among the prospectors, farmers and government officials, have it whitewashed within. The next class of building material most extensively used all over the country is the sun-dried brick. I know well the Mexican adobes, and have lived there in those comfortable adobe houses, cool in summer and warm in winter. Instead of those long slabs of Mexico, the sun-dried brick, called "dagga," or "red dagga" in Africa, are made like block, up to 10 and 12 inches thick for outside walls, and of smaller sizes for partitions. On the whole, there is no uniformity of size, neither for "dagga" nor any other kind of brick. Great parts of the towns, villages and farm houses are built from this material. Many houses have foundation walls up to some feet above ground made from rough masonry. Some houses on farms are of stone altogether.

Thatched roofs are disappearing fast throughout the country and make room for roofs of galvanized corrugated iron.

The first edition of Johannesburg was in dagga, but for dwelling purposes they are disappearing from the street fronts, where they are replaced by iron houses. In Johannesburg proper no new houses are put up in dagga. In the business parts stately buildings are constantly erected in brick, stone and iron; also for stores and boarding houses. Dwelling houses are almost all of iron, viz.: galvanized, corrugated iron sides and roofs, the newer and better ones lined inside with brick, and have brick partitions. The older iron dwelling houses, (as the one the writer lives in) are lined with sun-dried brick (on the inside). The rooms immediately below the iron roof are rather hot in summer and cold in winter. As a rule all ordinary stores, warehouses and mine buildings have all wooden framework and iron sides and roofs. The dwelling rooms for white employes and workmen, if brick, have the walls hard finished. Ceilings, as a rule, are of ceiling boards, varnished.



A Typical Native Matabele Chief.

NO NATIVE BUILDING TIMBER.

There are no native woods available for building purposes, and therefore every piece is imported. Small pieces of the hard and crooked native woods are only used for mine poles and fence poles. Every telegraph and telephone pole in South Africa is of iron and imported. America, viz.: United States, has a very large lumber trade with South Africa. We have red wood from California, chiefly for staves for cynanide tanks. Most of the building lumber, and principally for the mines, is Oregon pine. Port Blackley, in the State of Washington, is the chief port for export. The cubic foot costs in Johannesburg at present 3 shillings 9 pence ($0.93) to over one dollar. Pitch pine, from the South Atlantic States, costs at present per cubic foot 4 shillings 3 pence ($1.06). Flooring boards ⅞ by 4 inches (American), 10 cents per foot; ceiling boards cost (⅝ by 4 inches) 4 pence, or 8 cents per foot, etc. Baltic deal, 3 by 9 inches, from Norway and Sweden, in short pieces not more than ten feet long, costs 6 pence to 12 cents per foot running, and lengths of eighteen and twenty feet and more 7½ pence, or 15 cents per foot. Besides the 3 by 9 inch deal, there are also 3 by 11, and 4 by 9, and 4 by 11 deal to be had. For lighter lumber the above is split up by resawing; for instance, for the purlins for roofs, we use 3 by 4½ inch by splitting up a 3 by 9 inch deal, etc. All doors and windows are of American manufacture. They are packed for export in pieces; all the window casings are put together here. The lumber merchants here give to an American carpenter the contract to put together from the imported pieces perhaps 1,000 windows with casings complete at a time, so have a stock on hand in the same shape as we buy them in America. White labor is very high. At the mines a carpenter, machinist, engineer, etc., gets 1 pound ($5) a day and free room. The mines run six days a week, the gold mills, etc., seven days. There is always some extra work to be done, with extra pay, so that a white mechanic, as a rule, can make about 30 pounds ($150) a month. At the mine boarding house he pays, as a rule, about 6 pounds ($30) a month for board, with plenty of first-class food.

One of the most difficult things in Africa is to estimate the cost of works of any kind, and every year a great number of enterprises come to grief on that account. In regard to machinery, nothing should be cut down for saving weight. Machinery, especially for brickyards, will be exposed to very rough handling. There is no piece so heavy that it cannot be handled; bulkiness is a much greater objection, as far as sea freight is concerned, than weight, and as far as weights are concerned, I shall speak later on this point.

The assurance of the permanency of the large gold fields of the Witwatersrand is producing the money for the gold mining industry, the city of Johannesburg and all the enterprises around here and in the country at large. The money invested in the mines on the Rand amounts at present to about $400,000,000. One of these new, deep, level gold works, those large producers of gold of which there are now nine at work, costs all the way up to the stage of production three and a half to four million dollars. All the time with depth the gold reef is getting stronger and the ore richer. Certainly in a hundred years from now there will be here more new and larger gold properties developed and built up than now. On the other hand, the brick made two years ago were very poor and only half burned, and had cost at that time 5 pounds ($25) per thousand. (I know well when they cost $30.) At present a good average price for good stock brick is about 45 shillings ($11.25) to 50 shillings ($12.50) delivered at gold mines near. There is a very great difference in the price of fire brick, and also in the thickness of same. The price varies from 9 pounds 10 shillings ($47.50) to 17 pounds ($85). At a gold mine I was connected with last year we bought fire brick at Vereeniging, delivered at a railroad station near town for 11 pounds 15 shillings ($58.75); the brick were only 2¼ inches thick. On account of the extension of the town a good number of brickyards have been closed last year. Other yards have yet some stock on hand, yet keep on working steadily to keep the stock up, but I can clearly see that before long new yards will be required. Besides, great works are in prospect, as for instance, the city is just calling for plans and tenders for a complete sewerage system. The same is estimated to cost 700,000 pounds sterling; it will be 1,000,000 pounds ($5,000,000) before finished. The main expense will be large and long brick sewers, requiring many millions of good brick, and to furnish them there will be room and work for new brick yards.

(To be continued.)

Always be Ready to Smile.

Manners are everything—or almost everything—in the transaction of business. Pleasing manners, an obliging, gracious demeanor, a frank and ready smile, a visible purpose to accommodate—nothing can be more valuable to the advancement of business, either retail or wholesale.—Ad Sense.

Written for THE CLAY-WORKER.

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 3.

BY ALFRED CROSSLEY.

THE PRIMARY origin of clays, and and their more recent formation into deposits or veins as they now exist, is, as already said, but imperfectly understood. Many of the mysteries that now puzzle the minds of those interested in clay deposits and the mining of them would disappear if their history could be explained to us.

The very question of the proper definition of clay is by no means unanimously settled among men whom we may regard as authorities. Whether clay shall be regarded as a compound substance or a simple elementary body is still, or was within a very few years, within the region of discussion. One of the best of modern American writers on this subject (the late Prof. Brown) has said: "The solid mass of our globe consists substantially of three proximate elements, to wit: silica, alumina, and calcia, or, in plain English, quartz (or flint) clay and lime." According to this definition, silica, although in combination with alumnia, is always to be regarded as a foreign element, and never as forming a component part in that substance we call clay, which term is to be applied to alumnia alone, pure and simple. It is, perhaps, barely possible that in the light of future developments of science this definition may come to be held to be the right one, but according to the weight of opinion at the present time this definition must be regarded as incorrect, and that clay is properly to be regarded as a compound substance.

As a matter of fact, the term clay is applied to widely varying and often dissimilar substances, the only properties in common being silica, alumnia and water, and these in varying proportions. These, however are its essential elements, and by these we establish its identity, for any substance in which these are entirely wanting cannot be called clay at all. Hence the theory of kaolinite or pure clay has been formed.

A Busy Thoroughfare, Commissioner St., Johannesburg, South Africa.

Commercially speaking, there are many varieties or different kinds of clay. Hence we have fire clay—now under particular consideration—common clay, potter's, stoneware, china, ball, pipe, terra cotta, and many other kinds of clay, all more or less distinct in their characteristics, and recognized as distinct varieties by consumers and manufacturers. Then, again, they are sometimes divided as to color, and we have red, yellow, blue, gray, white, black, etc. But, speaking scientifically, how many kinds of clay are there? I answer, one, only one, and that is pure clay or kaolinite, as it has been termed. I commend to the careful consideration of the reader the following words by Dr. D. W. Stookey, one of our ablest contributors. He says: "In speaking about clays, it is not intended to convey the impression that there are distinct and separate varieties of clay. There is but one—pure clay—all others are simply adulterations or modifications. Pure clay is a hydrated silicate of alumina, that is, water, silica and alumina, chemically combined."

The composition of kaolinite, or pure clay, as the essential basis of all clay substances, as accepted by the majority of scientists, is as follows:

Silica	46.33
Alumina	39.77
Water	13.90
	100.00

May people do not rank clay as mineral, and the law courts have witnessed some considerable disputes on the question, but the developments of recent years in the production of aluminum should place this beyond a doubt, as clay is now shown to be the ore of that metal.

Dr. Percy, of London, treats at length on the above subject in his "Mineralogy" (volume "Fuels") from which I extract the following paragraphs:

Here the question naturally arises whether one definite hydrated silicate of alumina constitutes the essential basis of all the substances to which the name of clay is usually applied. The existence of a definite crystallized natural hydrous silicate of alumina has been certainly established. It is the mineral designated kaolinite by the American mineralogists, Johnson and Blake. The same word was previously used as a synonym for China clay, or kaolin, which is a corruption of the word Kaoling, the name of a mountain in China, where China clay was obtained. It occurs in the state of scaly, crystalline powder, which, under the microscope, is seen to consist of translucent or transparent rhombic or hexagonal plates, flexible and elastic, isolated or aggregated in bundles, either prismatic and usually curved, or fan-shaped; it is pearly in luster, white or colored by the intermixture of oxide of iron or other matters; it crystallizes in the system called the orthorhombic by Dana and prismatic by Miller; the bases of the crystals are marked with lines arising from the edges of superimposed plates, and the cleavage is basal; in hardness it ranges from talc to midway between selenite and calcite; its specific gravity varies from 2.4 to 2.63; it usually constitutes a compact, friable or mealy clay-like mass, greasy to the touch, or more or less plastic; it is decomposed by hot sulphuric acid, is insoluble in dilute hydrochloric acid, and in most of its forms is, with difficulty, decomposed by hot concentrated hydrochloric acid, but it dissolves completely in a strong solution of caustic potash or soda; it is infusible before the blowpipe or in ordinary furnaces.

Johnson and Blake examined microscopically twenty specimens of kaolin, pipe and fire clay, and found transparent plates in all of them, and most of them appeared to nearly consist of such plates. The kaolin from Diendorf, Bavaria, was, perhaps, the most finely divided of all white clays examined, and this, when dusted dry on a glass slide, seemed to be chiefly composed of masses of white substance, which were opaque or nearly so, in transmitted light, but, when fully illuminated above and below, had the translucent aspect of snow in the lump. Interspersed among these masses were extremely minute transparent plates of irregular rounded outline. The masses, when immersed in water, were almost completely resolved into similar transparent plates, most of which did not exceed .0001 inch in breadth. This description was found to apply to all the finer plastic clays, including the dark-colored Stourbridge clay, a compact brownish-gray pipe clay fromTable mountain, California, blue fire clay from Mt. Savage, Maryland, and various other white and colored clays from America, as well as unknown localities. The composition of many kaolins or china clays and other clays has been found to be the same as that indicated by this formula (that of crystallized kaolinite, see last table). In some of the analyses kaolin, as it occurs in nature, was operated on, and in other washed kaolin, as prepared for the manufacture of porcelain. Forchhammer, about 1830, adduced the same formula for the results of his analytical investigation concerning China clay, and presented it as expressive of what he termed the normal composition of kaolin. A substance of nearly the same composition as kaolinite has been found in a variety of clay ironstone, from Darlaston, in Staffordshire. It occurs in veins as a white powder, accompanied with calc-spar, and it was described as a hydrated silicate of alumina.

The preceding evidence seems to point to an affirmative answer to the question under consideration. The facts which have been certainly established are these:

1st. Crystallized kaolinite is a definite compound.

2d. Many kaolinites and other clays are identical with crystallized kaolinite in composition.

3d. Crystallized kaolinite exists in clays which vary considerable in external character and occur under different geological conditions, as well as in localities widely remote from each other, *e. g.*, Europe and America.

4th. It is demonstratable that many clays consist of kaolinite intermixed with free silica and other matter.

The following evidences, on the other hand, may be adduced in favor of a negative answer: The China clay of Passau, Germany, was found by Forchhammer to have the following composition:

Silica	46.23
Alumina	35.27
Water	18.50

The relative proportions of silica and alumina often vary considerably in different clays, owing to the presence of free silica, but as no process is known, either mechanical or chemical, by which free silica can be always perfectly separated, and a definite hydrated silicate of alumina uniformly obtained, it cannot be demonstrated that kaolinite exclusively forms the basis of all clays. Silicates closely approximating to kaolinite in composition, such as pholerite and lithomagne (Steinmark of the Germans), have been accepted as mineral species by mineralogists of high authority. It is a question, however, as Johnson and Blake reasonably suggest, whether those minerals may not be impure kaolinite. The mineral named halloysite only differs in composition from kaolinite in containing twice as many equivalents of water as the latter. Although certain specimens of halloysite have been found to lose half of it on drying at 100 degrees C. and so to acquire the formula of kaolinite, yet, as Johnson and Blake remark, it cannot be assumed that this loss is due to hygroscopic water, for many substances when dried at 100 degrees C., or below that temperature, lose part or the whole of their water of crystallization, *e. g.*, selenite. Moreover, halloysite has a much lower specific gravity and is more easily decomposed by acids than kaolinite. The conclusion which seems to be justified by the foregoing consideration is that one definite hydrous silicate of alumina, viz., kaolinite, has been found in many instances to constitute the essential basis of substances usually designated clay, and in the present state of our knowledge more than this cannot confidently be asserted. As one definite natural silicate orthoclase or potash feldspar can be shown to have yielded kaolin as a product of its decomposition by weathering action or otherwise, it might reasonably have been anticipated that this product would be definite in chemical constitution, and it is easy to conceive that other silicates allied to orthoclase should also, under similar conditions of decomposition, yield the same product. But it is not to be expected that this product should be pure in a chemical sense, because the decomposition of the whole of the silicate may not have been effected, in which case the product would consist of a mixture of kaolin and original silicate not accurately separable from each other, and also because the original silicate may have been intermixed with other substances, as in feldspar, with quartz and mica in granite, in which case the resulting kaolin would be associated with such substances. Hence quartz and mica usually occur in ordinary kaolin.

I have given the above quotation from the writings of Dr. Percy at some length, as indicating in some measure the extent to which investigations in this abstruse subject have been pursued. Although from this it does not appear that the question of an absolute definite composition of pure clay has been really settled, yet that this theory of kaolinite or pure clay, as the one clay and the basis of all varieties, is scientifically correct, seems at least reasonable from the following considerations:

First, the three primary elements or constituents, silica, alumina and water, are present in all clays, however they may vary in color, texture, appearance and other attributes.

Second, no material from which any one of these elements is entirely absent is used as clay or regarded as such.

Other elements are also usually found in clays, but their presence or absence do not affect the identity of the material as clay. The nearer the chemical composition of any material comes to the formula of kaolinite, as given above, the more pure the clay proves when subjected to physical tests, and thus a harmony is established between the practical and the theoretical. The water here spoken of is not hygroscopic, but the combined water, which, after it has once been driven off, can never be replaced by any art known to man, and the material is now no longer clay.

Many persons, doubtless, would laugh at the idea that the delicate white kaolin, the strong refractory fire clay, the hard and rocky marls and the coarse-looking common brick clay are so closely related to each other, or indeed have any common bond of kindred at all, and yet it is a fact that these four prominent varieties, with the numerous others that are intermediate, are all one family. If it be admitted that there is but one clay, viz., pure clay, kaolinite or silicate of alumina, it will be asked, how can we account for the great differences that undoubtedly exist? I answer, by the association with the clay of foreign matters or impurities, and the nature and qualities of the resulting compounds are largely dependent on the character and amount of impurities contained.

As we have seen, absolutly pure clay is rarely, if ever, found in nature, but there have been cases where clay approximating closely to absolute purity has been found. One of the most notable was in the Isle of Anglesey (Wales) and another at Darlaston, Staffordshire, already mentioned. It is indeed well for us that such instances are exceptional. If nature furnished us with only strictly pure clay it would indeed be a great calamity. There would be but one color, white, and a great variety of both useful and ornamental products, familiar to us now, would be impossible of production. Sewer pipes, paving brick, terra cotta and building brick of the kinds common to us would be out of the question, besides which we should weary of the glaring monotony.

Much of the above may appear to be a digression, and it may be asked, what has all this to do with fire clay and fire brick any how? This much, at any rate, that those who have heretofore had the idea that fire clay was a substance of an entirely different composition from any other may now see how closely it is related to many other clays that are certainly not fire clays. It may now also be easily understood why there is so much variation in the quality of different fire clays, caused by the different percentages of impurities contained.

Going back a little and referring again to the relationship I have spoken of as existing between all clays, I would remind the reader that the three elements—silica, alumina and (combined) water—form the largest proportion of every substance known or used as clay, whether fire clay, china clay, common brick clay or what not, and that the other elements, the foreign ingredients or impurities, are always in the minority. To prove the substantial identity of all clay substances I would suggest a simple experiment. Take any clay of acknowledged purity, say South Carolina or Delaware kaolin or New Jersey fire clay, add to it about one-tenth of its weight of soft iron ore, one-twentieth of its weight of the alkalies, potash and soda, with a sprinkling of lime and magnesia. Thoroughly mix and grind well together, so as to get the particles all blended, and, although we cannot expect to equal what is done in the laboratory of nature, yet the result will be a product by artificial means closely approximating many of our natural brick clays.

There is a gradual gradation in the chemical composition between common clays and fire clays, so that it is sometimes hard to tell where one leaves off and the other begins. Speaking generally, the nearer a fire clay approaches in its composition to that of pure clay the more refractory it proves. The proportions, however, of silica, alumina and water may vary without really affecting the refractoriness of the clay, that is, when uncomplicated by other conditions, as any combination of these elements is practically infusible at working temperatures. The value of any clay, therefore, as a fire clay, generally speaking, depends more on the absence of foreign ingredients of a fluxing nature than on the proportion of these primary elements. Of course, there are other matters besides the chemical composition that have a great deal to do with the quality of the clay. But it is to be observed that while it is possible for a clay of the requisite purity to fail as a fire clay, it is still more true that no clay can succeed as a fire clay, however favorable its other characteristics may be, unless it can pass muster in its chemical composition also. Of the value of special clays for different purposes high in silica or alumina, respectively, and of the influence of the various elements usually found in fire clays, I will speak further in the proper place. One essential difference between fire clays and stoneware clays, brick clays and others may here be pointed out. The value of a fire clay depends on its practical *absence* of impurities, while the value of other clays depends on the *presence* of impurities of different kinds and in different proportions.

We are All Laborers.

What's all this I hear about "The Man With the Hoe?" Sounds to me a good deal like what Uncle Cy used to call "hog wash." The fact is that a California school teacher wrote a poem under this title, describing the laborer as carrying the burdens of the world. What of it? Haven't we all got to carry burdens? Some must carry a yard-stick. Who among us has not an occupation—a hoe and a burden? To my notion labor is the distinguishing mark of civilization, the result of which brings compensation for the effort. The hoe wielder works to the same end as does the pencil pusher, and has no more cause to be

> "Dead to rapture and despair,
> A thing that grieves not and that never hopes.'"

What greater interest in life has the millionaire than that common to all men? We all carry a hoe—and many of us have a hammer concealed about our persons. Edwin Markham, the California school teacher, is using his hammer—and not without results. It pays him well to play the part of reformer and I can't see that it will have a harmful effect. So let him philosophize, and versify, and rail—until, by some unexpected dispensation of Providence, we are supplied with the necessaries of life without physical effort.—Ad Sense.

Written for The Clay-Worker.

CONSTRUCTION OF BRICK PAVEMENTS.

BY W. P. BLAIR.

The FIRST BRICK-PAVED streets put down in central Illinois were of deep satisfaction to the general public in comparison to the black mud of winter and the extraordinary dust of summer. Even as now paved, with brick such as they are, the streets throughout central Mississippi and Ohio valleys are such a relief and comfort that they are accepted as the best to be had. Much advance, however, has been made by the efforts of many of our civil engineers, especially in the line of durability, by requiring the use of first-class material in the construction of the same. Both the brick and the cement now used upon our streets, as well as the sand, gravel and crushed stone, must pass the ordeal of high standard tests until, as far as material is concerned, the very highest grades are necessary to meet the requirements. But skill and workmanship and manner of construction of brick streets has received scarcely any attention whatever, although of equal importance to the durability and all the desirable qualities. Is it too much to say that many of our college professors have spent more time than their conclusions would warrant to determine how best to test cement, brick or stone, and yet would be utterly lost in an effort to instruct a class how to build a brick street.

W. P. Blair, Sec'y and Gen'l Manager Terre Haute Brick & Pipe Co.

As to brick, there is being produced from the factories at Terre Haute, Veedersburg, Clinton and Brazil vitrified paving brick which, when properly and skillfully put into the streets, will outlast (excepting, perhaps, portions of not exceeding twenty-five of the heaviest traffic streets to be found throughout Indiana) an entire generation. As much may be said of many Ohio, Illinois and Iowa brick. Experts making a critical examination of street work, put down as hereafter described, have accepted the foregoing conclusion as true. If possible, let us conceive some conditions which are desirable in a finished street, and then answer if they can be accomplished.

The sanitary requirements should be such that no deposit of

Tippecanoe Street, Terre Haute, looking Eastward from Sixth St. Toward Big 4-Passenger Depot. Pavement in use five years. Subject to heavy Traffic, still as Smooth as Asphalt. Terre Haute Brick used. See page 269.

filth or dirt of any character upon the streets should be allowed to ever pass through the pavement to contaminate the soil. The surface should be made smooth. If these conditions exist a forty-foot street need never be over six inches lower at the gutter than at the center, thus enabling the public to use for roadway purposes the entire width of the paved street. The street should be such that its use would not tend to disturb those residing along its way, and so the noise should be at its minimum. Can brick streets be made so? We answer, more nearly so than from any other material of which streets have been made up to this time. Any competent engineer can probably provide the profile, plans, etc., and the subgrade is reached without much trouble, the curb having been set. The next movement is to put in the foundation. This may be either of concrete made of gravel or crushed stone, or, for a street of medium or little travel, say a residence street, of gravel containing enough sand so that no crevices remain that may, after the street is finished, take away the cushion; never of crushed, screened stone alone, as no crevices or air can be allowed at all. If concrete foundation is made immediately following its being placed upon the street its surface should be rammed so that no stone, not one, will be left protruding, but made entirely smooth and all parts brought to grade, which must be ascertained only by some method of measurement. The "eye" man has no business on a job that is to be made right. If any broken stone be left above the surface, or partly so, the deflection will cause a break in the filler and a consequent extraordinary wear and chipping of the brick which is made to lie upon it. If gravel foundation be specified it must be rolled and thoroughly compacted, so all parts of the surface are brought to a perfect grade, before the sand cushion is applied. The mistake must not be permitted of allowing the little depressions here and there to be filled with sand, and thus have the sand cushion thicker in some places than in others. A finished and complete foundation, of whatever material, in all its details cannot be ignored. The cushion is next to be supplied. It must be neither too thick nor too thin. Two inches are found to meet all requirements. If less, the deflection will break the filler bond. If more, a proper compacting is almost impossible, and here again it is necessary to have the sand clean, sharp and uniform. If either element is lacking you cannot have a first-class street. If sand is not clean and sharp it cannot be compacted alike along the street, and little depressions must occur. If not uniform the same result will follow. Again, the eye must not be trusted, but the depth must be measured, and the grade more perfect, if possible, than that of the foundation. Next, the brick. Of course, they must be thoroughly vitrified, and neither so hard burned that they have commenced a swelling, spongy process, or so underburned that they will absorb water to injure them when freezing. Courses must be laid on a straight line. As to size, 3 by 4 by 9 inches should be the limit, and 2½ inches thick is quite sufficient under this construction Along with putting the brick in place, next to either curb should be laid an inch board on edge the width of the brick, likewise at right angles with the street at intervals of every fifty lineal feet. This board should be left until in all other respects the job has been finished. When the brick are thus laid, all broken brick should be removed and the surface swept clean, preceding the rolling and compacting of the brick into the sand cushion. The writer has noticed just at this point instances where men pass along the street and throw sand upon the surface of the brick, as though not satisfied with how rough the surface would be after a rolling, but rather how much rougher it might be made. The construction has reached its most important stage, and the brick must be evenly rolled, thoroughly rolled and perfectly compacted, and the sand under them thoroughly compacted. This can only be done with the proper thing. You cannot possibly do it with a horse roller. You cannot possibly do it with a roller exceeding six tons weight. A five to five-and-a-half steam roller is the thing. The brick must be brought to a plane; they must not be left standing diagonally—"creeled," as we call it—no matter how slightly; it will invariably result from the use of a very heavy roller. A perpendicular is the only position allowable for the brick in the street; yet we have seen miles of street laid where the proper position of the brick in the street was the exception. We were recently upon an important street in course of construction where it was a puzzle to find two brick side by side in the street brought on a level with the other. In many instances, it is true, this could only be determined by an instrument, but the greater portion was plainly discernible to the critical eye; yet the rumbling, rattling noise, that should only belong to a bowlder or granite street, was the only resulting thing to expect. The cushion underneath the brick was not compact, so that the first heavy load over it would displace every brick it came in contact with, and each succeeding load would perform a like disastrous mission. The street was thus prepared to receive the filler.

A little later we examined the finished street, applying the knife between the brick where it should have been solid cement, a mere crust, readily broken, and it was found the brick were practically lying loose in the street; yet we found the brick man had given a five-year guarantee on that street. Of course, the brick will last that long, but at the end of that time it will be in such a condition that the brick will receive the condemnation for all existing evils of the street, when, in truth and in fact, the brick were, in the first instance, about the only thing which entered into the construction of the street that was right.

There is just one way to put in a filler. After the brick in the street are made to present a splendid plane for travel, and are made to rest compactly on a thoroughly compacted cushion, they must be made to remain so. A kiln mark, a little rough protrusion, a slight chipping on an occasional brick, is all that must be allowed; the whole general surface must be one of uniform evenness. A frequent method employed is by placing a large slush box in the center of the street and mixing a large quantity of cement and sand, and then, by use of buckets, throwing the sand upon the street, and then, by the use of root or rattan brooms, try to sweep the mixture into the joints. It may be some parts of the gutter will, by chance, receive the proper amount of a good filler. It is a shame to have a street properly made up to this point and spoiled by an ignorant application of the filler, or, if you please, by any filler except a cement filler. If your street is forty feet wide, place three small slush boxes in a row across the street. Put into each half bucket (one to one) cement and sand, dry; mix this dry, and thoroughly, before a drop of water is added; then, when so mixed, add water until it is the consistency of cream; keep this in continual motion, stirring and putting on to the street with a shovel (never a bucket), and, with steel wire brush, force it into the cracks of the brick, adding only water by gentle spray, until every interstice is thoroughly filled. Barricade the street, and bring into service every force of the law to keep the public off this street until the filler has thoroughly set. Before ready to open for traffic, and before the cement has set, remove the boards at either side which were put in at first; fill the space two-thirds full of asphalt pitch and balance with sand. This done, you have a street which grows into an ideal street as months and years go by—not getting poorer and out of repair, but constantly growing better, we do not know how long. This we do know and can show: Jobs five, six and seven years old, in the city of Terre Haute, made practically as here indicated, which grow, by friction wear, slightly better as years pass by, with every evidence of betterment for several years to come. They cost nothing for repairs, but are a continual satisfaction, and are pronounced in unequivocal terms by every examining expert, as being the best the country has produced. Nor do these streets cost more than the poor one. It is simply the careful and intelligent watching of every working detail constituting the construction. After all, it is a work skillfully done. But that skill is as absolutely necessary to the construction of first-class streets—streets of comfort, durability and economy—as skill is absolute in erecting a great coliseum so that it will stand and life be not lost.

Brick Paved Alley in rear of Row of Livery Stables. Perfect Sanitary Protection Although Subject constantly to Accumulation of Filth. Easily and Quickly cleaned. No portion of the Filth ever entering Through the Pavement into the Soil.

Can't Afford to Change.

Never let a man who is heart and soul with your business leave your employ if there is the slightest chance of retaining him, says the Drygoodsman. He is the reserve force of your work and is the supporting army for all aggressive movements. There may be hundreds who can be hired for a great deal less money, but it is like dropping coins into the sea. The man who pushes and pulls, who suggests and carries out, offers and fulfills, is not measured entirely by dollars and cents and you cannot afford to let him go because another is a little cheaper. —Exchange.

Written for The Clay-Worker.

TERRE HAUTE BRICK PAVEMENTS. No. 2.

THERE is a good, better, best in almost every line of human production, and this is true of brick pavements.

Without question the best pavement in Terre Haute is to be found on Tippecanoe street, which is a narrow street paralleling the "Big Four" Railway track and on which its beautiful new depot and its freight house is located.

To us this stands as the most perfect piece of brick pavement we have yet seen, though lacking the elastic joint to make it complete in every respect.

It is subject to a very heavy traffic between depots, manufacturing establishments and warehouses, and though it has been laid a number of years, it is not easy to find evidence that a steel toe calk or a wheel has come in contact with it. The Terre Haute man will tell you with pride that it was laid with the brick of the Terre Haute Brick and Pipe Co., and that all pavements laid in the city since 1894 are laid in the use of the same make of brick. The concrete foundations were constructed in the use of natural cements, we believe of the Louisville brand in every case.

South Fifth St. Terre Haute. Down Seven Years but still Perfectly Smooth.

There is one thing more, worthy of note in connection with the pavements of this city, and this has to do with its

—Paved Alleys—

We are unacquainted with any city, large or small, which has given so much of space or so much of care and attention to its alleys; a considerable number of which, in the business center, are 30 feet in width, and these are generally paved with brick, and with the same apparent care as is given to the paving of its business streets. We made extended trips through these alleys without running across anything offensive or that could be characterized as a nuisance. These alleys are generally guttered in the center, and the evidence is that they are as well washed out and receive as much or more attention as is given to the principal streets. In one case we saw two neat residences approaching completion on one of these twenty-foot alleys, and they did not seem to be much out of place. When it is remembered that the rears of our places of business and of our hotels generally abut ill-kept and often filthy alleys, the good sense of maintaining such a condition as is found in the alleys of this city, both in the interest of comfort and of sanitation, is apparent, and the question at once comes to the mind, How is it that we have come to tolerate alleys in the condition in which we usually find them? When we remember the essentials that appertain to the proper paving of our alleys we are forced to admit that there is nothing available, aside from paving brick, to meet these demands. And what are these essentials? We answer, first, they should be of a character to resist the wear and banging of the heaviest traffic, for in them our merchandise and our fuels are largely unloaded. Second, they should be of a character to be kept sweet and clean under the imposition of refuse of all kinds, of stables and of hotels, reeking garbage barrels, stable manure and ash heaps. We take the law and the practice as usually appertaining to the alley, and it means just this (and this condition of matters is tolerated, as a rule, because, as ordinarily paved, to be foul and full of malodorous conditions is assumed to be the normal condition of an alley.) When the barrel of garbage is removed the stench remains, since the soil on which paving stones or plank or macadam are laid has become saturated, and when brick have been used they have often been hard-burned common brick, usually with a sand filler.

Asphalt is utterly unfit, since ashes and acids soon rot it out, and it becomes porous and retentive of filth while it yet preserves its body. On the other hand, a good vitrified brick, laid with cement, is ideal in every respect, and meets every condition, as a visit to the alleys of Terre Haute will show, and to enforce their use in the crowded business centers of our cities will yet be considered one of the most important of sanitary measures, we believe.

This field alone is to be an enormous one in the future. Chicago has over 1,100 miles of alleys, probably averaging 18 to 20 feet in width—say averaging full one-half the width of the roadways of our paved streets.

As we have shown, in this matter also Terre Haute holds probably the leading position, and any one who should pass through these alleys as we have would find the word alley could be made to stand for cleanliness and wholesomeness, and that the air taken in at the rear windows of business blocks may be as wholesome as from any other quarter.

Enlarging our vision a little, and giving attention to other pavements in Terre Haute besides those of brick, we are tempted to make some comparisons. Brick does not need to elbow its frail sister, asphalt, in order to secure abundant standing room. There is room for both, and asphalt has its place. What that place is is yet a matter of question in Terre Haute, in view of past experiences. While South Sixth street, as has been stated, is paved for a mile or more with brick which is rendering its ninth year of service without the suggestion of a need of repairs, South Seventh street, with but a block between, was five years ago paved for the same distance with asphalt, the contractors being among the most prominent in the business. This pavement was warranted for five years, and it was found necessary to repair it generally several times during this period. The contractors were obliged to leave 10 per cent. of the contract price as a deposit to secure the faithful performance of their agreements until the end of the term. When the five years expired, a few months since, the street was in such condition that the contractors preferred forfeiting the 10 per cent. to making the needed repairs, the whole surface of asphalt having become too thin to permit of safe patching. There is on this street a single line of electric car track, but this fact we believe is fully compensated for by the diversion of traffic of other vehicles to Sixth street to avoid the cars and to accommodate the shyness of the average horse.

Other experiences on much the same lines, not involving forfeiture by the contractors, but leaving the pavements on the city's hands in a patched but practically worn-out condition would not seem to leave the Terre Haute taxpayer favorably disposed towards asphalt.

Following this somewhat rambling narrative, it may be well to gather up the lessons and impressions received. First has come the conviction that brick as generally used have not had a fair chance and that the triumphs they have achieved are due to their own intrinsic merits rather than to the setting which has been accorded to them.

Second, that the lack of wear shown on the Wabash avenue pavement after nine years of service, which may be deemed to represent in volume that which will cover the traffic in nine-tenths of our city streets, furnishes abundant evidence that a cement filler, intelligently and faithfully applied, is the natural complement and ally of brick.

Third, that the prejudice which exists against brick, because as ordinarily laid it has represented a rattle, is a prejudice that will vanish when sand and tar filler give place to cement.

Fourth, that a square rather than a round-cornered brick is best adapted to secure a noiseless brick pavement in connection with a cement filler. The rational of this will become apparent when we consider that the thin fin or edge of cement which occurs in connection with a rounded corner is much more likely to crumble away than is a square corner of the brick supported by cement. The difference being shown in Fig. 2.

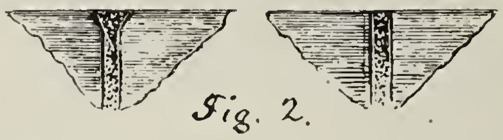


Fig. 2.

A fifth lesson, and one as important as any other to our mind, is this. Witnessing what traffic has been borne by this nine-year-old pavement, laid on a foundation greatly inferior to a concrete foundation, in that it gives evidence that it is in places unsupported or partially so because of voids, we conclude that a properly constructed natural cement foundation, with a suitable intervening sand cushion on which to rest a facing of first-class paving brick, laid in a first-class manner and filled with a properly prepared Portland cement filler, carefully and thoroughly applied, will resist the heaviest traffic of our cities better than any other pavement known, for have we not found such pavements giving literally no evidence of surface wear after years of service, as on Tippecanoe street, before alluded to?

That recently similar pavements have been laid in other cities we have been glad to note, and we shall have occasion to refer to them in later papers; but it takes years to demonstrate such problems, and, so far as we can learn, Terre Haute has the distinction of having made this demonstration for the country.

E. G. DURANT.

THE OHIO CERAMIC ASSOCIATION.

THE FIRST meeting of the Ohio State University Ceramic Association for the year 1899-1900 was held at Orton Hall Tuesday, Sept. 19, with a good attendance of old members and the presence of many new "clay" students.

After a short social session the business of organization was taken up, and, as might be expected from past records of representatives of the Buckeye State, the offices all went to Ohioans. The officers elected for the coming year are as follows: President, Walter M. Fickes, of Steubenville, O.; vice president, Walter A. Hull, of Orangeville, O.; secretary, William Cannon, of Plymouth, O.

The ceramic class is larger this year than ever before in its history, and students are in attendance from many parts of the country, from Oregon in the west to New Jersey in the east.

Improvements are constantly being made in the equipment of the ceramic department, and this fall has witnessed the completion of a new kiln for experimental work, with an accompanying enlargement of the kilnhouse to twice its former size, with new fuel bins, pyrometer closet, etc.

The senior class has entered upon some very interesting work in the way of clay testing and body manufacture. Experiments are being made to throw light on the subtle property of placticity and the factors on which it depends, and qualities associated with it.

"Varsity."

A FINE PRESS BRICK PLANT.

Alumina Shale Brick Co., Bradford, Pa.

PENNSYLVANIA RANKS first as a State in the production of brick and tile. Among her many clayworking manufactories are included a number of plants that turn out immense quantities of high grade pressed and ornamental brick, which find a market chiefly in the large cities of the Atlantic coast. Included in this category is the Alumina Shale Brick Co., of Bradford, Pa.

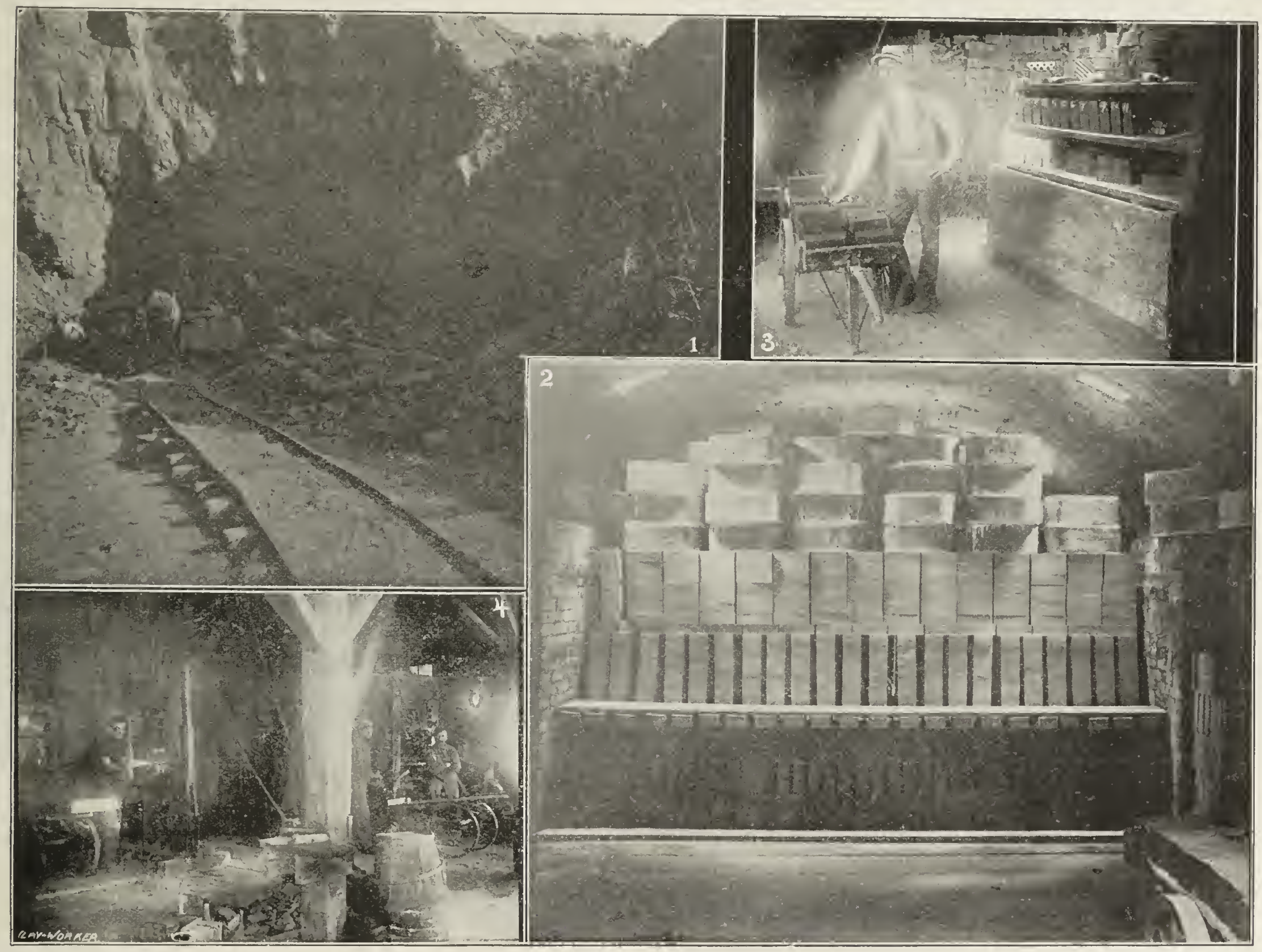
The company was organized in the early part of 1893, and the first brick were turned out in July of that year. They have a large tract of land well situated for their needs, which gives them an inexhaustible supply of excellent shale. This is taken from the face of the hill, and lies beneath two or three feet of ordinary clay. As they dig into the hill the vein of shale grows in depth; where they are now working it is about forty feet deep. The shale is dug by hand, and hauled in dump cars by a wire cable on a friction pulley or hoist. It is first crushed in a Frey-Sheckler dry pan and then elevated up to and passed through a funnel shaped screen of their own designing.

The brick are made by the dry press process on two Boyd presses, which they commend very highly. Indeed they think their entire mechanical equipment is up-to-date and hard to beat. For small orders of special shapes they have a hand press that answers a very good purpose. From the presses the brick go directly to the kilns, of which they have nine of a down-draft pattern of their own designing, and which they have found well suited for burning with gas. The kilns range in size from a small one for rush orders, holding 20,000, to those holding 130,000.

The common brick go to the local market, and the front brick to Eastern cities mostly, where their excellence both in form and color have made them very popular with the architects and builders. The works are located at Lewis Run, six miles from Bradford, between the Erie and B., R. & P. railways, which afford them fine shipping facilities.

In addition to their pressed brick, which they make in all shades of red, buff and brown, they are also making enameled and glazed brick of all kinds. This latter feature of the work has assumed very gratifying proportions.

The success of the plant is due in a large measure to the wisdom and eternal vigilance of T. J. Melvin, secretary, treasurer and general manager. The other officers of the company are C. P. Collins, president; C. V. Merrick, vice president, and J. P. Melvin, assistant secretary and treasurer.



Aluminum Shale Brick Co.—1. The Clay Bank 40 feet high. 2. Interior of Kiln, Red Brick at Bottom, Buff Brick in Center and Ornamental Brick in Saggers. 3. Sorting Brick in Stock Room. 4. The Press Room, Hand Press to left Boyd to right.

Accomplish One Thing at a Time.

Once for all I want to say that I will not patronize the man who is too busy to give me his undivided attention while transacting my business. Some men seem to forget that there's another day after the present, and I've learned that where one attempts to do several things at one and the same time he doesn't perfect any of them. But I've "cut out" this man from all my business dealings. I'm going to patronize the fellow who politely asks me to wait my turn, and then when the time comes my wants are satisfactorily attended to without interference.—Ad Sense.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK. No. 21.

IN THE CLASSIFICATION of subjects coming within the scope of physical testing, made in the March CLAY-WORKER, the topic of "structure" is followed by "porosity," an arrangement which is too arbitrary to be in logical sequence, for porosity, in the consideration of clay wares, does not occupy as important a position as plasticity and shrinkage, though intimately connected with the latter. For this reason we shall let porosity take a back seat until plasticity and shrinkage have been duly considered.

Any one entirely ignorant about the matter of clays would certainly first observe the property of plasticity, which enables him to mold them into any shape, and which they retain. It would seem but proper to expect that clay-workers are in possession of definite information in regard to this so important quality of clay. But sore disappointment awaits him who thus looks for definite knowledge in this respect. It is like the question, "What is electricity?" We do not know. We know that plasticity is due to an essential ingredient of all clays which we can separate out chemically, and, to a large extent, mechanically—clay substance. We know how plasticity obtained from this substance is modified by nonplastic materials like sand, lime, etc.; that shrinkage, bonding power and the ability to absorb water are related to this phenomenon; but we do not know why clay substance is plastic. There is no lack of theories on this question, but so far no one hypothesis has been able to answer all the necessary conditions. A number of men have investigated the cause of plasticity, and excellent and brilliant work was done in this research, but as yet with the above result.

Plant of the Aluminum Shale Brick Co.,

One of the first theories advanced was that plasticity is solely due to the combined water of clays, which is never found absent. At first sight this does not seem so improbable, considering the fact that all clays have combined water; that as soon as a clay is heated to red heat and loses this water of combination plasticity is destroyed and cannot be restored. But if one considers that other mineral hydrous silicates of alumina, containing much more chemical water than clays, do not show the least plasticity, this theory must fall, for if it makes one silicate of alumina plastic it ought to do the same with all of them.

Among the eminent men who have given their thought to this investigation J. Aron occupies a prominent place. A great deal of conscientious work has been done by him, and hence his experiments and results have a right to recognition. We think it is but fit and proper that we dwell somewhat in detail upon the work of this earnest man, and we cannot do better than use the words of Dr. Zwick in that excellent volume, "The Nature of Brick Clays."

First, Dr. Aron endeavored to prepare pure clay substance (hydrous silicate of alumina, as the chemist calls it) by means of the Schoene washing apparatus. In order to test its purity, he determined the amount of water vapor the dried mass was able to absorb from the air. This absorbing power, and hence the quantity of water absorbed, is definite, and is changed directly when nonplastic ingredients are added to the clay. Hence it was suggested that the water absorbing power be used as a test for the contents of clay substance, or, in other words, by drying a piece of clay thoroughly, weighing it, letting it absorb water vapor from the air, and again weighing the test piece, it is possible to tell how much of the clay substance is present in the clay, a result which might be useful in determining how much a clay is purified in washing.

Clay substance of this character was used by Aron by molding briquets of certain dimensions, which he observed very closely in regard to the decrease in volume on drying, and also determining the volume of the water which was evaporated. Now, the interesting result obtained was that the cubical shrinkage always corresponded exactly with the volume of the water evaporated. But at a definite stage long before complete dryness no more decrease in volume was shown, although the balance of the water was evaporated completely.

This point, at which shrinkage stops, Aron called the "limit of shrinkage," the water evaporated up to this stage "shrinkage water" and the water evaporated afterwards "pore water." The latter, since no more decrease in volume takes place, evidently leaves cavities, pores.

Further experiments of this sort showed that shrinkage takes place uniformly in all three dimensions, and that the proportion of pores is always the same in the dry clay, thus being independent from the quantity of water originally contained in the clay paste. The more plastic a clay is—that is, the more water it can take up and the more it thus increases its volume—the more it shrinks in drying; but the amount of pore water does not increase, which means that in plastic clays the pores do not become larger nor greater in number.

Since the proportion of pores in the clay substance of very much differing clays remains nearly the same, Aron expresses it as his opinion, supported by microscopic examinations, that the most minute particles of clay substance have a regular, very likely a spherical, shape, and finally arrives, in regard to plasticity and shrinkage, at the following representation:

A plastic clay paste is an emulsion of minute clay spheres suspended in water at equal distances from each other, but which keep each other in equilibrium, whence come the greasy feel, the mobility of the particles and the ability of being molded. The distance between the spheres is so minute that they attract each other and thus form a system of capillary tubes, which are more or less filled with water. But the latter cannot be expelled from the tubes by pressure owing to their resistance to flow through them. Plasticity begins when the particles are in equilibrium at a certain distance from each other, and ceases either when the distance between them becomes so large that they are removed from the zone of their mutual attraction (as in the case of very soft, slush-like clay), or when the small clay sphere touch each other, which state has been reached when the clay is dry. At this last stage all the shrinkage water has been removed, but the pore water, which occupies the space between the spheres after they touch, still remains. Plastic clay containing the maximum amount of clay substance has the greatest number of spherical clay particles and capillary tubes, and hence holds the greatest amount of water. All impurities, mineral detritus, decreases the amount of clay substance, and hence also the amount of water necessary to render the clay plastic.

Other investigators, as Biedermann and Merzfeldt, doubt the truth of Aron's assumption of the spherical clay particles, since they could not observe them in their microscopic examinations. However, this does not necessarily contradict Aron's conclusions, because of the limits of microscopic work.

Another one of the theories advanced to explain plasticity is the so-called interlocking theory, which holds that peculiar curved crystals are the cause. However, this assumption is entirely erroneous.

Since microscopic work shows that the particles of clay are extremely fine, it has been claimed that plasticity is due simply to the fineness of grain. And at first it does not seem unreasonable, if one considers that a clay always becomes more plastic the finer it is ground. But it seems that if fineness of grain alone produces plasticity, any substance, if ground fine enough, should become plastic. This also seems to be true to some extent. For instance, if sand is ground very fine and then moistened it will show a weak plasticity, but it will never retain its shape, as is characteristic of clays. The writer remembers having seen glass ground so thoroughly in a ball mill that, on being placed in a pail in the form of a slip, it settled to the bottom and formed a sediment of such hardness that it could be removed from the receptacle only with difficulty. And yet the moist mass showed but a very slight plasticity, and, when dry, it did not retain its shape at all. There is evidence enough to show that the apparent plasticity of fine particles other than clay is due simply to the water which holds them together.

The last theory which we shall mention is the so-called cleavage theory, which is of great importance, since it seems to explain many of the peculiarities of clays, and the work done in connection with it is more extensive, having been done by a number of men, than Aron's researches. In fact, we might say that the truth appears to lie between Aron's and the last named theory. The microscopic work done by Cook, Johnson, Blake and Haworth shows that clays are composed, to a large extent, of mineral plates and crystals, which vary greatly in size, from comparatively large ones to such of extreme fineness. Now, plasticity, it is claimed, is due to the sliding of the fine plates upon each other. Clays having a large percentage of such fine plates show a high plasticity, and *vice versa*. Stress is placed upon the shape, for fine particles or crystals, according to this theory, although they may be much finer than plates, do not give rise to plasticity. Now, in speaking of these particles, it must be realized that they are extremely fine, from 0.00001 to 0.000001 of an inch in size.

Professor Wheeler, in Volume XI of the Missouri Geological Survey, brings up very strong arguments in favor of the fine-plate theory. He starts with the assumption that if it is true that plasticity is due to fine plates, minerals which, by virtue of their structure, can on grinding be reduced to fine flakes should also be made plastic, according to the grinding and splitting up they have undergone. Minerals of this character are the various kinds of mica, talc, slate and spar. And it was found that some of these minerals, which had no plasticity to start with, could actually be made plastic on grinding.

Several common phenomena of clays might be explained by means of the fine-plate theory, such as the overpugging of clays; when this takes place the thin flakes are supposed to be broken up by too much working, and hence plasticity is lessened. Likewise, the difficulties in drying plastic clay, the difference in strength between stiff clay and dry pressed ware and the weathering process do not seem so hard to understand in the light of this theory. Plastic clays, according to the fine-scale theory, hold the water necessary to work them tenaciously interlocked between the fine plates, so that the water is prevented from escaping readily, first, by the capillary attraction between the flakes, and, secondly, by the irregular tubes formed by the numerous scales of which the clay is composed.

In clay worked by the plastic process the interlocking of the flakes due to the comparatively large amount of water present, which permits of the movement of the scales upon each other, is much stronger than that produced in dry pressed brick, in which the clay is forced together only by pressure, without the floating action of the water. As a result, the stiff clay brick

and Bradford Enameling Co., Lewis Run, Pa. See page 271.

burned below the vitrifying point of the clay will be found to be invariably stronger than the dry pressed brick made from the same clay and burned at the same temperature.

In the weathering of rocks, as we all know, the crystals are broken, little by little, by splitting up along the planes of cleavage, a fact which can be observed almost everywhere. Similarly, frost, heat and water act upon clays. The coarser particles are split up into smaller ones, the thicker flakes into thinner ones, and thus plasticity is increased with the increased number of thin plates.

So much for these theories. They are theories at best, and still lack the essential proofs which are to change them into recognized facts. But they all do their share towards finding the truth, at which we are bound to arrive. Although the subject of this article deals with a good deal of theory and speculation, the writer has no apology to offer for bringing them up for attention. As clayworkers we ought to be interested in the fundamental qualities of clays, and whatever tends to increase our knowledge in this respect should command our hearing, for, after all, there are things outside of those having a direct bearing on dollars and cents which should interest us if our craft is worthy the name of an art.

In the next paper the testing of plasticity and shrinkage will be the topics for discussion. AMERICUS.

OFFICIAL ANNOUNCEMENT.

The Fourteenth Annual Convention of the National Brick Manufacturers' Association, to be Held at Detroit, Mich., February 5th to 10th, 1900.

To the Members of the N. B. M. A.:

The following cordial invitation from the brick manufacturers and municipal officers of Michigan's chief city tell of the advantages of Detroit as a convention city so forcefully that we are convinced no better location can be selected for our next annual convention, and we have therefore decided to meet in Detroit the week of February 5th to 10th, 1900.

Hotel Cadillac will be headquarters and will afford every possible facility for convention work, as well as insure the very best of accommodations for all who attend, for the Cadillac is one of the most popular and best managed hotels in the United States.

In due time reduced railroad rates will be arranged for and all other details looked after and announced in the usual way. The N. B. M. A. now shares the universal prosperity, an unusual number of new members having been enrolled during the last year, and there is every reason to believe that the next convention will be the largest ever held.

Clayworkers who are not now members, but who wish to join the association and attend the Detroit meetings, are requested to write to the secretary at Indianapolis for full particulars.

THE EXECUTIVE COMMITTEE.
T. A. Randall, Secretary. W. D. Richardson, President.

DETROIT'S BID FOR THE NEXT N. B. M. A. CONVENTION.

T. A. Randall, Secretary N. B. M. A., Indianapolis, Ind.:

Dear Sir—We have read with more than passing interest the reports in recent issues of THE CLAY-WORKER telling of the improved condition of the brick market in the different cities of the country, and can echo the general expression of satisfaction over the increase in demand and price of brick. We brickmakers of Detroit are in it to a moderate extent. For several years we have dragged out a miserable existence, fighting each other for orders and cutting prices until there was nothing left but vain regrets and unholy thoughts, each counting the rest a soulless and senseless lot of pirates. And judging from results found in empty pocketbooks and overdrawn bank accounts, the verdict seems justified. But now a better time has dawned—a happier condition prevails, thanks to the brainy efforts of Mr. H. Houghton, who, in spite of many discouragements and after much hard work, has succeeded in forming a local Brick Exchange, and through it is leading the brickmakers of Detroit from the wilderness of demoralization to the promised land of peace, good will and fair prices.

We have been talking the matter over and have come to the conclusion that we want the brickmakers of other cities to come and see how happily we are situated, and sample the good fellowship which now prevails among us. We want the National Association to come here next winter and help us celebrate our deliverance from bondage, as it were. At a called meeting recently the matter was fully considered, and it was unanimously voted to invite the N. B. M. A. to hold its next convention in Detroit, and we were instructed to so advise you and assure you that every facility for conducting the business and advancing the interests of the Association will be afforded.

Detroit is a brick city. We build our homes, our store houses, our churches, our factories, and our great commercial structures of brick. We make our streets of brick, and now have many miles of brick pavement of which we are justly proud, and which we want your members to come and inspect. You have met in several neighboring States, now it is our turn, and we want you to come into Michigan and partake of our hospitality. If you will do so, we will bend every effort to make your stay both pleasant and profitable. We wish you could come in the summer time, for then Detroit is at her best, but as that is impractical, come in the winter time, and we will try to make our welcome so warm that the temperature will be forgotten.

Hoping that you will accept our invitation, and assuring you of our desire to welcome every member of our National Association to our city, we are, Sincerely,

DETROIT BRICK MANUFACTURERS' EXCHANGE,
George H. Clippert, Chairman.
Walter J. Hayes, Secretary.

Commonwealth of Michigan,
Executive Office.

To the National Brick Manufacturers' Association:

Gentlemen—The location of Detroit commends it favorably to all who attend conventions, on account of its accessibility by railway and steamboat lines, and it therefore affords me much pleasure as Michigan's chief executive to extend to you a cordial invitation to hold your 1900 convention in Detroit.

The natural advantages of Detroit as a convention city are excelled by none other. The climate at all seasons is all that could be desired.

It can truthfully be said that no other city in this country has the advantages and convention facilities of the beautiful City of the Straits.

In the past half a dozen years Detroit has unconsciously made for herself the name of "The Convention City," until to-day that title is applied to her by national bodies as they seek out available places for holding coming meetings.

Her advantages are too numerous to mention in a letter, but among them are the excellent facilities for reaching the beautiful parks and Belle Isle, ice yachting, skating, rapid railway service and splendidly paved streets for carriage drives, etc.

The citizens of Detroit and Michigan take special pains in making visitors welcome, and I trust you will select Detroit as your 1900 convention city. Yours truly,

(Signed) H. S. PINGREE, Governor.
Detroit, Mich., Oct. 7, 1899.

Executive Office, Detroit, Mich.
William C. Maybury, Mayor.

To the National Brick Manufacturers' Association—Greeting:

With natural advantages equaled by few and excelled by none, Detroit claims your attention as a convention city.

The climate here is the most salubrious, and contributes greatly to our city's attractions.

A broad river of pure water, connecting Lake St. Clair, six miles above the city, with Lake Erie, eighteen miles below, separating the United States from Canada, affords safe navigation for all kinds of craft, and abounds with picturesque islands.

Abreast of the city and connected with the American shore by a draw bridge five-eights of a mile long, over a deep and navigable channel, lies Belle Isle, a public park of nearly 800 acres, the pride of the city and an object of admiration to strangers. From it can be seen the fleets of the entire lake system passing in stately review.

The city has a population now approximating 365,000, magnificent public buildings, hotels, auditoriums and halls.

The central location of Detroit must commend it to all who attend conventions, on account of its accessibility by railway and steamboat lines.

Our hospitality is freely extended to the members of your association. We will welcome all who visit us, and promise them most cordial attention. Sincerely yours,

(Signed) WILLIAM C. MAYBURY, Mayor.

Detroit, Mich., Oct. 5, 1899.

Chamber of Commerce of the City of Detroit.

To the National Brick Manufacturers' Association:

Gentlemen—The Chamber of Commerce extends to your associaa cordial invitation to hold your next annual convention in Detroit. The advantages of the city for convention purposes are well known, and conventions held here are uniformly satisfactory to those in attendance. Very respectfully yours,

(Signed) J. C. FERRY, Secretary.

Detroit, Mich., Oct. 5, 1899.

Detroit Convention and Business Men's League.

To the National Brick Manufacturers' Association:

Gentlemen—The Detroit Convention and Business Men's League joins heartily in the invitation extended to your association by our local brickmakers to hold your next annual meeting in our beautiful city.

Detroit is without a peer as a meeting place for national bodies. The fame of our broad streets and boulevards; our grand public buildings, auditoriums and hotels; our picturesque lake and river resorts; our park and pleasure grounds, all made of easy access by palatial excursion steamers and a modern electric street-car service, has been spread from seaboard to seaboard by the hundreds of national conventions that we have successfully entertained in the past.

To hold a national convention in Detroit always insures an increased attendance of delegates and visitors and a profitable meeting and a good time socially are thus guaranteed.

Quadriga and Pediment of the Main Building National Export Exposition, Philadelphia.

The citizens of Detroit have earned an enviable reputation for hospitality, so we trust you will deem it wise to accept the invitation freely extended, and select Detroit as your convention city for 1900. Very truly yours,

(Signed) H. W. AVERY, Secretary.

Detroit, Mich., Oct. 5, 1899.

Doesn't Like to See Prosperity.

"That there will be kickers in heaven I can readily believe, therefore I am never astonished at the variety and volume of kicks here below," said a traveling salesman, "but I found the strangest beast of that species last week over in Michigan. His peculiar wail was against the general revival of business, and the only solace that he had was the hope that the presidential election next year would take the edge off the universal boom. His line was premium articles which he sold to merchants—portraits, silverware, etc.—for gifts to draw trade. Dull times are good times for him, and vice versa. When crops are abundant and factories running overtime grocers and butchers do without his ware, and it is only when money and work are scarce that people demand a crayon portrait or set of spoons with their tea and pork chops."—Ad Sense.

Written for The Clay-Worker.

PHILADELPHIA'S NATIONAL EXPORT EXPOSITION OPEN AND IN FULL SWING.

The Quaker City, since the opening of the September month, has been all a tip-toe, willing to receive and eager to give its guests a good time. Following quickly upon the heels of the departing G. A. R. men came the opening of its National Export Exposition, brightening up the glories of the blue vault above, with the charm of its many banners and flags flung to the breezes in token of good will to all nations and the citizens of the world.

Passing the turn stile, where you are permitted to drop your entrance fee, you find the seductive hurly burly of the Esplanade Midway Plaisance and hear the old time legend shouted through the megaphone, "Walk up, we are just about to"—Bang! Bang! You've heard it before. The celebrated women dancers from the Orient, displaying their charms and gyrations for a sum less modest than their native squirming, and the educated horse figures up very cleverly how many times he will go through the same old tricks before he gets a square meal. The Navajo and Moqui Indians have pitched their wigwams in close proximity to the almond-eyed celestial, who, with their wives and children, number some 450. The scene is varied, and affords many changes; it also calls for some—therefore see before you go into these quarters that you have at least 10 or 12 shekels in your pocket.

Facing the midway or plaisance one scans the facade of the main pavilion, capped with a quadriga, standing sixteen feet high from the base to the top, and symbolizing "Victory," while right and left depict "Transportation and Navigation." Beneath this the great pediment representing "Commerce" stands out in bold relief, set up in composition instead of staff, while between the doorways in circular plaques are the seals of the United, the State of Pennsylvania, the Commercial Museum, the Franklin Institute and the city of Philadelphia. All this, together with the walls of the big buildings, serves to show the adaptability of clays and the genius of clayworkers, lighted up by old Sol during the day and made glorious at night by the genius of man and the wonders of electricity. Bright, mysterious and marvelous are the workings of the bobbin and shuttle, and where is the man who does not care to linger over the costly model of a crack cruiser, costing somewhere near a million dollars. Here stands the exhibit of Cramp's shipyard, with models of the Texas, Indiana, New York and Brooklyn, while near by may be seen the epaulets of the defeated but none the less brave Admiral Cervera, and many other relics of the late unpleasantness. Further on you see the exhibit of George Remy set forth, from a stein to a sixteen-foot pickle jar.

At the south end of the main pavilion Cyrus Bargner identifies himself with a fine exhibit of tiles, fire clays, ground brick, etc., in all shapes and sizes, from the bull head, arch, skew, on down. A pleasant challenge from the headquarters of the "Main Belting" Co., and, turning, I find myself alongside columns and pyramidal forms of "Leviathan" belting. Just the material to commend itself to the machine men. Mr. J. H. Roth is taking care of this end, and, while he very modestly took the praise given for the smart, clean exhibit, said: "You can't say anything better for us than we could say and feel for The Clay-Worker."

On every side the spaces have been taken up, but it seems a matter of regret that our clay products have not made a larger display. Here are good opportunities for thrusting upon public attention tiling, brick, terra cotta, pottery and all the products of allied clayworking arts and industries.

Baltimore is making a bid for space; maybe other cities may do so, even at this late hour, and what's the matter with a little brick machinery? Now is the time to push these things along, when the throb of the machinery and the click and tap of the tools manual show to an interested crowd the successful side of a splendid exhibition. W. P. Lockington.

Written for the **CLAY-WORKER.**

FAMOUS HISTORICAL PITCHERS.

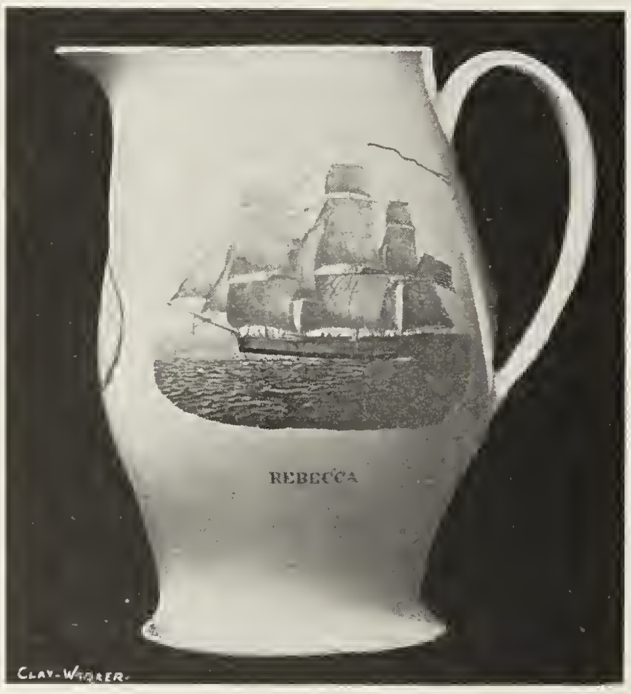
BY MRS. MARY E. NEALY.

THESE PITCHERS are of Liverpool ware, of a creamy tint, with decorations printed in black. Prints are much finer upon this soft pottery than it is possible to make them upon porcelain or so-called "stone" ware. Portraits of heroes, scenes of battle by land or sea, and mottoes and allegorical decorations are favorite subjects for the decoration of these large pieces, generally made as memorials of heroism, to be handed down from generation to generation as heir-looms of our ancestors.

The Washington Pitcher, View I, shows a perfect copy of Gilbert Stuart's notable portrait of Washington. It is a splendid oval portrait in line engraving, and probably the best ever reproduced upon pottery or porcelain. It was copied directly from the pitcher, then in the possession of R. T. Van Deusen, of Albany, N. Y. The names of owners of excellent copies from the original painting by Stuart would readily fill a volume, a great many having been made by Miss Stuart, the artist's daughter, which are so nearly as good as the original that only an expert can detect them. I have seen as many as a dozen in Washington alone, while the engraved copies are innumerable.

WASHINGTON MOTTO PITCHER.

This pitcher is elaborately decorated with trophies, mottoes and inscriptions. The first side has Washington standing, with his foot placed upon the head of a crouching British lion. A squad of soldiers, a ship upon the ocean beyond a sea-wall, with flags and cannon, encircle the scene and inclose the legend "By virtue and valor we have freed our country, extended our commerce, and laid the foundation of a great empire."



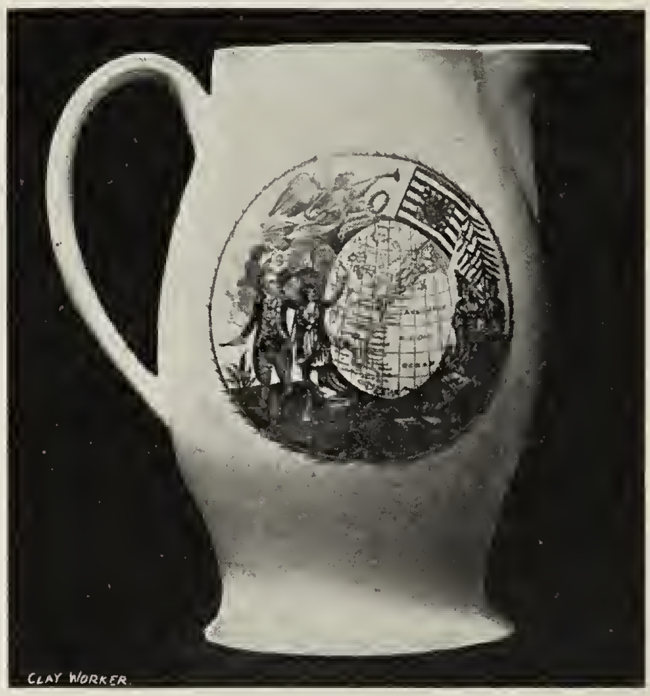
Dr. Colburn's Historical Pitcher.

On the reverse is an oval, surrounded by flags; a liberty cap, wreaths, etc., with "Independence" below, and within the oval the verse

"As he tills your rich globe the old peasant will tell,
While his bosom with liberty glows,
How your Warren expired—how Montgomery fell,
And how Washington humbled your foes."

MAP OF THE ORIGINAL THIRTEEN STATES.

This pitcher belongs to Dr. G. F. J. Colburn, of Washington, whose beautiful home is filled with rare and beautiful bric-a-brac, and whose wife is equally fond of the beautiful in nature and in art. This is really an heir-loom, as his grandfather, captain of the merchant ship Rebeka, had a portrait of his vessel printed upon the reverse side of a pitcher decorated with the map of the States upon the other reaching from the Gulf of Mexico to the Great Lakes. Captain Samuel Coffin's name is inscribed on the front of a pitcher in a wreath, and he ordered one pitcher for each grandchild. Dr. Colburn said he thought he would leave his pitcher to the National Museum, having no child to inherit it. The country back from the Atlantic was then called the "Country of Mines," and on the map Franklin stands with the Goddess of Plenty to the right of the map and beneath a pine tree flag; while Washington stands by History and points out the divisions of the country; and Fame, with his trumpet and wreath, hovers above them. The pitcher was made at the Herculanium works, Liverpool.



Map of U. S. Original States.

* * *

Since writing the above the good doctor and his dainty wife have passed to the silent land, within a few months of each other. Peace to their ashes.

Written for the **CLAY-WORKER.**

BUTTON-HOLE TALKS.

"BE YOU WILLY GATES?"

He stepped briskly up to me, notwithstanding the burden of ninety-odd years which he bore. His fine, old face was seamed and wrinkled by care and time, yet wreathed in smiles as he vigorously clasped my hand in his, and hung on, while his other hand reached for the ever ready buttonhole. His bright eyes twinkled as they looked into mine, as he made the inquiry, evidently as an introductory remark, his firm clasp indicating that he knew that he had me, and knew whom he had, and that the meeting was calling up the past with him, as it certainly was with me.

I assured him promptly that I was "Willy Gates," and I recognized instantly good old Deacon Meade, and with the recognition I was indeed Willy Gates, and the years had rolled back again and I was a careless, barefooted boy, decorated with stonebruises, seeking a fugitive cow that held the long distance record in that community, if not of the world, and still was not resting on her laurels. Most of my young life was spent in hunting her, but there were some small intervals in this research, and the sight of the good old deacon brought these back to me with a rush. As, moved by a common impulse, we both sought a convenient seat, the years slid away, and again I was a boy in the little old village church, with the deacon, but not alone. Silently but swiftly the church was populated with those who had slept their quiet sleep in the cemetery for many years, but who now, came quickly to renew their part at the good deacon's behest.

" 'Member just how you used to look in a front pew in the old church, sittin' in your little 'round about,' gettin' so allfired sleepy that you couldn't keep awake till 'carraway time.' Always carried carraway and gen'ally handed it around when good old Parson Filler got to seventhly. My! My! Hadn't thought of him for a long, long time, but he was surely a good old saint. He believed in good measure. Believed in it better'n his flock did. He didn't get quite so much pay as the parsons do now. No, not by several cords. His pay was as little as his patience was long. He wasn't a bit niggardly, though, in the measure he gave, and he'd hunger along on his pittance, puttin' more polish on that shiny old suit of his and keep dishin' up hour-and-a-half sermons just's though he couldn't do enough to earn his money.

Washington Motto Pitcher. Stuarts' Washington. Washington Motto Pitcher.

"Now days they salary their rectors with more money than the whole village had in them days, and now the less the dominie says and the quicker he gets through the better they like it.

"Well, well! How seein' you brings it all back to me! 'Member the old prayer meetin' and old Deacon Price? Say, but he was a team, wan't he? The onregenrit did used to say that he put his religion on and took it off with that Sunday suit of his'n. Couldn't he trade hosses, though? Never traded with me but once, and then the relic he left me was about the smallest pretense for a hoss I ever see. I never did quite forgive him for doin' me so awfully brown that time. There were them that claimed that when the deacon got to talking in prayer meetin', and got real interested and emphatic, and was tellin' what a poor, misable, dispisable sinner he had been, that I used to yell 'Amen' most too loud and emphatic. Say, Willy, it used to hit him hard. He would get all wrought up an' interested in his talk, tellin' what a mis'able, wretched, mean man he'd been, when I'd yell 'Amen' good an' loud an' hearty, he'd stop just like you do when you run up agen the edge of a door in the dark, an' he'd look at me, and swaller hard, an' stop an' kind of settle his chin down, an' clinch his hands up, and breathe hard, an' then quit on that tack an' go to tellin' the Lord all 'bout ancient history.

"Then there was good old Deacon Dutton, who fed his hosses an' everything on the place well. He never missed. He'd drive them four miles, rain or shine, hot or cold. He was always there, an' no prayer meetin' was complete 'thout his 'Nuff for each and 'nuff for all, and 'nuff for evermore,' and 'The chiefest 'mong ten thousand and the one altogether lovely.' He was a sure 'nuff saint, and has been now long years playin' one of God's sweetest golden harps.

" 'Member old man Frizzley. He never attracted any attention or wanted to. He just played back-stop and took anything that went past Mrs. F., an' you bet they wan't much got past her. 'Course you 'member her; corkscrew curls done up so tight she couldn't wink till she got home an' let 'em out some. They used to say she twisted the old man up just like she did the curls. He quit and welcomed death long years ago.

"Then there was old Deacon White and his wig. After his better half quit he was a hunter. Never could get anyone to be his life partner, but he never quit tryin'. He had a long chase after Sister Smith, the one with the red hair, you know. Surely he was pretty far gone with her that time he got a new wig for himself to match her shade.

"Well, we must quit this some time, and I have four miles to walk and will start. Desperit glad I met you, but Willy, you are a little bit loquacious. You ought to give me some show, and not do all the talking yourself." GATES.

Written for the CLAY-WORKER.

A BRICK FACTORY IN A WOODEN TOWN. No. 17.

L. M. C.

IN MY FORMER ARTICLES, considerable has been said on the subject of burning in updraft kilns. But any alteration in a kiln would necessarily imply a corresponding alteration in methods of firing. There are certain first principles of producing and distributing heat that apply to all kinds of kilns, furnaces, and materials to be burned. I shall not attempt to discuss these principles, for that has been done time and again in THE CLAY-WORKER by men who understand the subject much more thoroughly than I do. But having given a full description of our kilns as modified to suit our clay, it seems best that a description of our methods of managing them during the burning should be given here, even if there should chance to be some repetition of ideas set forth in former papers.

In watersmoking by the furnaces alone, care must be taken that the fires do not heat up too rapidly at first and check the arch bricks near the furnaces. But after a few hours slow firing one can proceed safely and allow brisk fires in the furnaces. But during the entire period of drying off, the furnace doors should be kept wide open, that a free draft might assist in carrying off the vapors and gases that form so rapidly during the earlier part of firing the kiln. I have tried firing with furnace doors closed, but could never succeed satisfactorily in watersmoking a kiln of brick. The moisture forced from the lower bricks passed off so sluggishly that the cooler bricks above caught it and converted it again to water, which settled over them and rendered them wet and slippery to the touch.

Again this water had to be vaporized and started on its journey from the kiln, and perhaps again be caught by cooler bricks and held for the advance of the heat below to give it a third start. Often bricks become so wet from this collection of moisture that when the heat strikes them they check badly, whitewash, bloat, and often crush entirely out of shape. So give all the draft you can during the watersmoking and the early fires for raising heat in the kiln. This may seem a great waste of fuel, but I have never succeeded in drying off a kiln of brick by any other method without damaging the wares to some extent. I believe a forced draft by means of fans would be a great benefit in watersmoking bricks made of very tender clays, but I have never tried such appliances.

But our bricks that are burned in connection with drain tile have a clearer ring when struck together than those burned where the kiln is filled entirely with bricks. So that I am firmly convinced that the value of a strong draft at this period cannot be overestimated. Be sure that the moisture is all driven off before raising heat to any considerable extent. In this I differ from many burners in up-draft kilns, who claim to follow up the watersmoke closely with the heat, and to have the kiln red hot almost as soon as the watersmoke is gone. They may do this, but I cannot do so with our clay.

I do not commence raising the heat to a red until the top bricks have reached the boiling point. Then gradually raise the heat until the top bricks are red, when harder firing should be given until the desired degree is reached.

The greatest trouble in managing the heat in up-draft kilns is to prevent “runs” in places, where the heat will become too great, leaving cold spots in other parts of the kiln, that often perplex the burner. If he fires hard to reach them, the heat will run to the overheated spots in spite of any dampering he may do. Soon certain parts are overdone and settle out of shape, while the cold spots are no hotter than they were hours before. At last, in desperation, he ceases firing and lets the kiln go a half failure. All this trouble is easily avoided in our kilns if one takes the matter in time. One can tell by observation in the peepholes how the heat is advancing in the different parts of the kiln. Should any part fall behind, do not wait until the hotter parts have become well done before attempting to correct the unequal heating. But close the flues over the hot places and open them wide over the cold spots, and soon the desired result will be reached. Do not rush the fires during this period, but steadily and slowly go after those cold spots, and you will never fail.

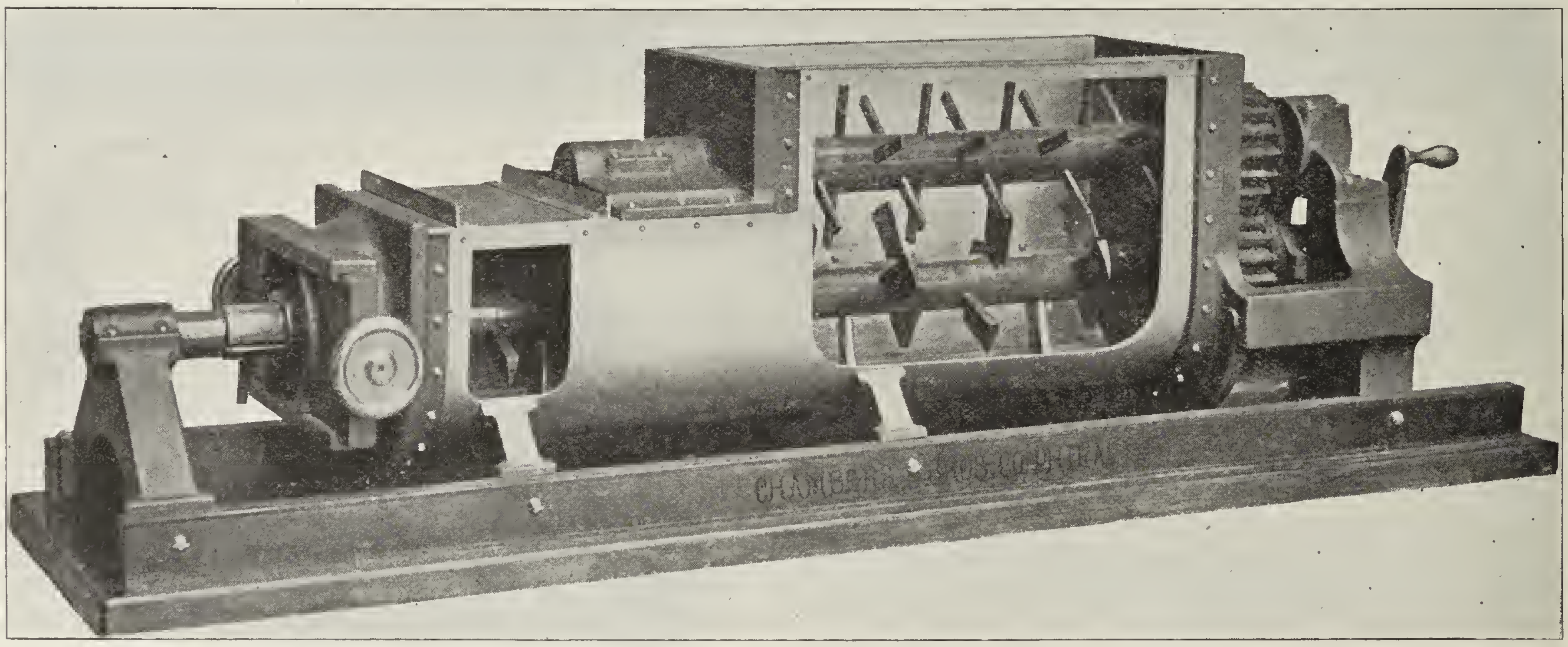
But if the burner makes a mistake and gets the kiln settled out of shape, so that you cannot change the draft from those hot places, just seal the kiln bottom and top as if the burn were completed, and let it remain for about five hours. Then open and fire steadily for about two hours. Seal again and leave it as before. Repeat this about three times, and, though you have suffered considerable delay, you will have the satisfaction of finding a fairly good burn in spite of your burner's mistake.

Should the cold spot be in the center of the kiln, it may be necessary to slide fuel to the center of the arches, as in the scove kiln. Generally these cold spots are caused by a failure to have the moisture all off before commencing hard firing. The last places to become dried off will prove to be the cold spots of the kiln. The draft will run to the dryer parts of the and often the careless burner will have these places well burned before the moisture is driven from the cooler parts of the kiln.

These matters must be carefully looked after and attended to in time, or much trouble will result. But vigilance and a timely manipulation of the dampers will secure unvarying success. Not that all burns will be similar, but all will be good enough to make the per cent. of second grade bricks very small.

THE CHAMBERS DOUBLE SHAFT MIXING AND PUGGING MACHINE.

THE ACCOMPANYING illustration is made from a model designed to more clearly show the principle of the new mixing and pugging machine manufactured by Messrs. Chambers Bros. Co., of Philadelphia, Pa. It is being used with much satisfaction by fire brick manufacturers, paving brick works and others desiring to secure a thorough mixture of grog or other finely ground dry material with stiff plastic clay. After passing the two shaft mixing part of the chamber the material enters a confined portion, where it is worked or pugged under pressure, thus securing a result that is hardly possible in an open tub with stiff clay. The frame of the machine containing the driving gears and friction clutch pulley is not shown in the model from which our photograph is made. Chambers Bros. Co. make this machine in two sizes, and guarantee it in every respect. They report their automatic side cutter as meeting with increased sale and winning friends among their customers wherever used.



The Chambers Double Shaft Mixing and Pugging Machine.

They are at work now upon a new stone extractor, designed to separate clay and stones without crushing the stones, and expect to have the first machine ready for trial within thirty days.

BY THE LIGHT OF THE KILN FIRE

"TALKING about responsibility," said the Lounger, "there isn't a man filling a public office for the first time, no matter how high or important that office may be, who feels one-half the weight of responsibility that a young burner feels when he takes charge of his first brick kiln. And I want to say right here, unless he is a damphool entirely, it is not the young burner who gets a bad burn. Your bad burns are almost always the result of too much self-confidence or neglect, caused by a reckless reliance upon the burner's ability to handle a kiln under any condition. I never saw a bad burn after a new burner yet. However, I want to tell you about an experience that I had myself along in the early days when I first found myself intrusted with a kiln. I was at work with a man who will recognize this story. He had, the winter before, brought up a lot of peeled hemlock logs that had lain in the woods for a year, until the sap wood, for an inch deep all around them, became spongy. They were whopping big logs and looked perfectly dry. In order to admit them into the arches, we made the kiln mouths extra large, and I believe we ate up twice the price of our big hemlocks in mouth wood on that account.

"We got the kiln ready for burning, and I was put on the night watch with Willard Carr, a big, strapping lunkhead, who had never stuck a stub in a mouth. Willard's brain was of the order that reverses everything. When I told him to fill a mouth loosely he invariably jammed it full, and when I told him to fill one full of quite dry wood he just as invariably hunted up the largest and wettest round log in the pile and put into it. I was obliged at last to order Willard to go to sleep, which he did with alacrity. Then I tended to the kiln alone. It went all right until the last night. The kiln had settled some, and then hung up, and we could not start her. All day they ran the dryest, hottest fuel into her, until the flames shot up through her top a foot high, and still she refused to budge. Growing desperate, I picked out the biggest dressing of the dry hemlock that I could find, and, without cooling an instant, I ran it in over the glowing coals. In half an hour I was the most scared mortal you ever read about. Those arches began to settle, and you could fairly see them walking down. The jets glowed like pure white snowbanks in a January moonlight. As I looked in the peephole they seemed waltzing back and forth, while the roar of the fire from the hemlock punk sang through the kiln like the bubbling and roaring of the devil's workshop.

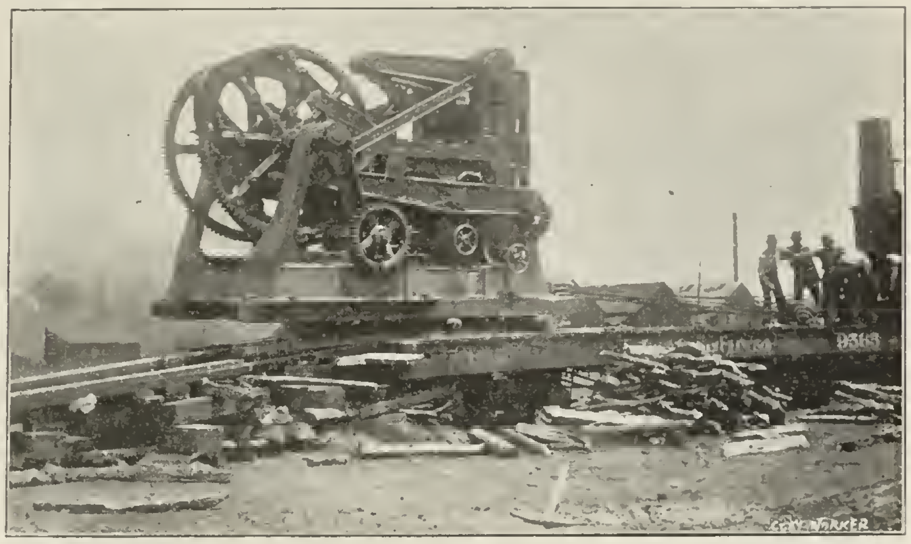
"There was nothing to do but kick in the mouth wood and let her breathe, and this I did, though I expected to see the heat make a wild run into the closed head and drop the arches flat. Who can describe my feelings? No man can understand them unless he has been in the same place. First, there was the ruin I had brought upon my employer, and there, too, was the disgrace of getting a bad burn. At times I was tempted to race off and wake him up; but what good would that do? I thought. So, to subdue my wild anxiety, I went out upon the brickyard and turned handsprings, backsprings and all sorts of contortions for half an hour. Then, when my weariness had overcome my anxiety, I stole back to the kiln and timidly sneaked a look into one of the arches. I expected to find it fallen and melted to the ground. Imagine my astonishment when I found every arch in its natural shape and rapidly becoming black with cold.

"Did I breathe a sigh of relief? Well, I guess I did; but there was work ahead. The punk on the hemlock having been burned, there was nothing but solid wood left, and that proved to be wet, too wet, almost, to burn. That was the first real hard work Willard had been obliged to do on that kiln. I woke him up and set him hauling some eight-foot-long dry pine edgings, and from then till daylight I did nothing but walk back and forth from arch to arch, darting them full of pine. I could dart an eight-foot edging from head to head. Willard worked very hard, and so did I. In the morning I had recovered most of the lost heat and had got the kiln walking down again. The kiln settled with a slight trench across her quarters, or "thirds," as old-fashioned burners called it, but after playing dry edgings under the hump all next day she leveled down, and the boss said it was one of the best burns he ever had.

"I never dared tell him, however, how near I thought I had come to ruining the kiln. Talk about responsibility! None but young burners suffer from it. THE DREAMER."

A MASSIVE MACHINE.

MODERN brickmaking machinery of all kinds is much heavier and stronger than that made a few years ago. The tendency of late years has been to build brick presses larger and more massive, till now an up-to-date press is quite a formidable piece of machinery. As an example, look at the view of the Progress press brick press, taken as it was being loaded on a flat car to be shipped to the Terrell Pressed Brick Co., Terrell, Texas. It weighed 52,000 pounds. It was delivered safely in good time, and has since been running to the entire satisfaction of the Terrell Pressed Brick Co., a new enterprise, and one that bids fair to be a successful one, for they are turning out an excellent quality of pressed brick, for which they are getting a good price.



A Progress Dry Press Brick Machine being Loaded on Car.

The Satisfaction of Honesty.

Dr. James Stalker says you should not envy the idle man. You may have too much to do and too many things to think about; still, do not envy the man who has not enough to think about and has to fall back upon himself. The passion of human nature breaks loose in idle men and wander over forbidden places seeking what they can devour.

You have all heard it said that in our day it is impossible to do business honestly. Depend upon it, that is just the cant of scoundrels. Would you not despise a minister if he suppressed the truth in the pulpit to please his hearers? Would you not despise a soldier who turned his back when he came near danger? You know perfectly well the verdict that you have to pronounce on yourself if for any worldly consideration you go on outraging your own conscience. No, it is honesty that succeeds. Perhaps it does not succeed immediately, and therefore those who are for immediate results sometimes are impatient, but a high-minded man will place his faith in a genuine article and a fair price, and in the end he will not be disappointed.—Ad Sense.

AUGER MACHINE ROOFING TILES VS. REPRESSED INTERLOCKING ROOFING TILES.

IN A RECENT number of the "Thonindustrie-Zeitung" Mr. R. Koller discusses very interestingly the respective advantages and disadvantages of the two prevalent patterns of the German roofing tile market. By auger machine interlocking roofing tiles are meant tiles which are pressed on auger machines and cut on suitable cutting tables, leaving the latter in the finished condition, ready to be dried and burned. Repressed interlocked roofing tiles pass through two stages of molding. First, soft clay "blanks" are run out on an auger or plunger machine, which are pressed with tiles on represses, usually of the revolving drum type, in plaster paris molds. The first kind are, as a rule, much simpler in design than the second.

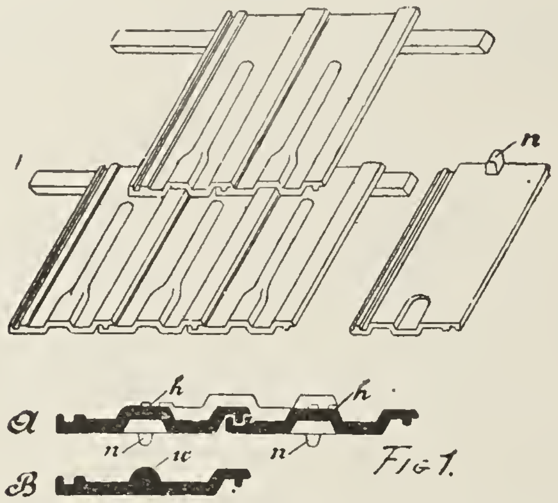
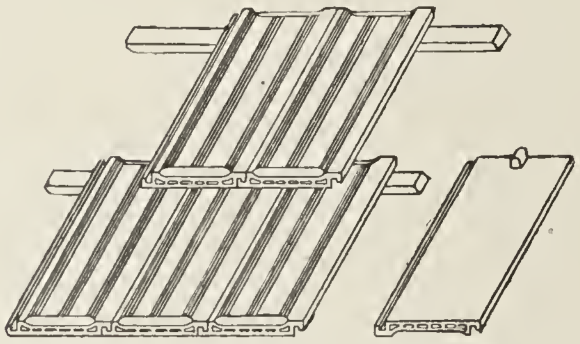


Fig. 1.

The plaster molds, although they have, so far, not been replaced successfully by metal molds, are a great source of trouble in the manufacture of interlocking pressed roofing tiles. First, the proper kind of plaster must be selected for a particular clay in order to obtain durable molds. Since many molds are continually needed to replace the worn ones, two men are kept busy for every revolving press making plaster dies. This is equivalent to a considerable expense, since it is not a very easy matter to make good molds, besides the cost of the plaster. The durability of the plaster molds varies with the clay. With plastic clay, free from grit, they last long enough to make several hundred tiles; with gritty clay they last but a short time. Also the liability of breaking of such molds must be considered, for while a mold is being replaced, the press and its crew stands idle.

Owing to the absorbing action of the plaster, a rough and porous surface is given to the tiles. The capacity of a revolving press is limited, varying from 3,000 to 4,500 tiles per day with a well trained crew.

Since the molds consist of two parts (an upper and lower) a seam is formed around each tile which must be removed by trimming, an operation requiring extra hands. This expense alone amounts to $2.12 per thousand (8.5 marks). In a factory making from one to two million tiles per year the cost of trimming varies from $2,100 to $4,000 per annum. Since, on trimming the ware an excess of clay is removed, and since, also, on pressing, clay is squeezed out between the halves of the mold, it is very difficult to keep the press room clean, and usually the hands are compelled to stand in a mass of soft clay.



Finally, the complicated design of the pressed interlocking tile does not speak very favorably for it. Summing up, they have the following disadvantages:

1. A careful selection of plaster is necessary.
2. The making of plaster molds causes an extra expense for plaster and wages.
3. The plaster molds are not durable, and the changing of molds causes stoppages.
4. The tiles have a more or less porous surface.
5. The capacity of an interlocking tile press is low.
6. The tiles must be trimmed.
7. The press and its surroundings cannot be kept clean.
8. The tiles are complicated in design.

In the manufacture of auger machine interlocking tiles these disadvantages do not exist, for no plaster molds are required, but the clay passes through the die as a continuous column, which is cut into tiles on a wire-cutting table. The tiles are placed on pallets and taken to the drier. No trimming is necessary.

The column leaves the die with a smooth, dense surface, so that a tile of this type absorbs less water than one pressed in a plaster mold.

Although a slight waste occurs at the cutting table, it can be easily removed, since it collects at one place. The capacity is four to five times that of a single acting press and twice to three times that of a revolving press. The design of the auger machine tile is much simpler, and hence the drying pallets can be made in a simple pattern.

Considering the simplicity and regularity in the making of these tiles, requiring only three men for feeding the machine, cutting off and taking away, it seems evident that auger machine interlocking tiles are far superior to repressed interlocking tiles.

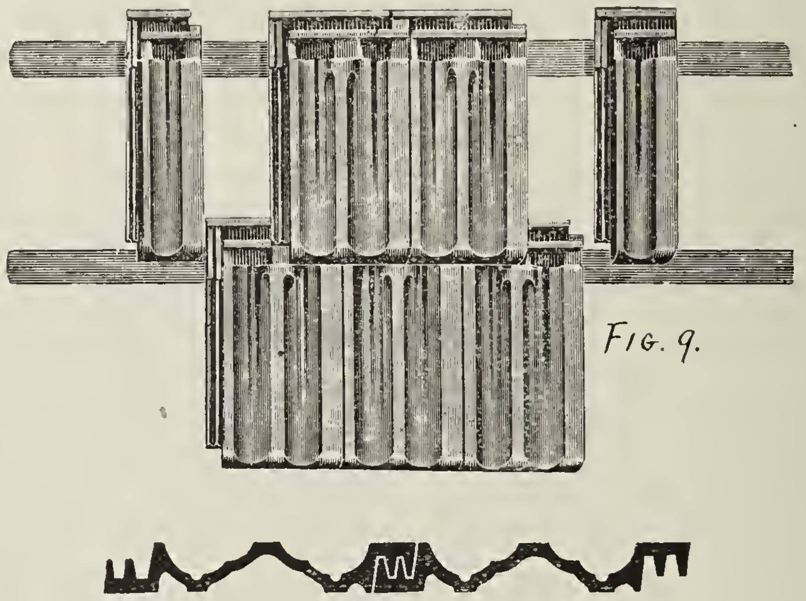


Fig. 9.

BRICK PAVEMENTS BEST.

Here is a good thing on pavements from the Bloomington Pantagraph: Mr. Ira Merchant is one of the well-known civil engineers in the West. Mr. Merchant has returned to Bloomington after a visit of a month in Denver and vicinity. Speaking of the business condition in the West, he says that it has not been good, but there is now a chance for improvement. Denver and the other principal towns in Colorado depend on the mines for their prosperity, and, when they are in any way affected, the whole region suffers. The smelters have been closed down for some time, and business has been consequently very dull. Most of them are in operation again, and the outlook is better. The climate, Mr. Merchant says, is delightful, the evenings being cool enough to require the use of a blanket. It is uniform, and the ordinary mortal is not troubled with beads of perspiration as he is in this section.

The question of pavements being discussed here at the present time, Mr. Merchant told of the experience of Denver in the matter of asphalt pavements. According to his observation the asphalt blocks are a failure. The streets are full of holes and beyond repairing. It will keep a repair outfit busy all the time keeping the streets in condition, and then the task is impossible as far as doing it completely goes. There are miles of it in Denver, but it is not a success. Mr. Merchant does not believe that a pavement is designed that will take the place of the old style brick. He cites the case of the block on the south side of the public square. This was laid in 1880, and is still in fair condition for the number of years it has been laid. The block on the west side of the square was laid in 1877, and has been resurfaced only once. He cites these as samples of the durability of brick pavements.

BUSY BRICKYARDS IN THE SOUTH.

PROSPERITY is so general throughout the country that *busy* describes the condition in nearly every section where brick plants are located. The only exceptions are where the trade conditions are such as to require an additional adjective, and there are many trade centers in the land now where *very busy* expresses the prevailing conditions.

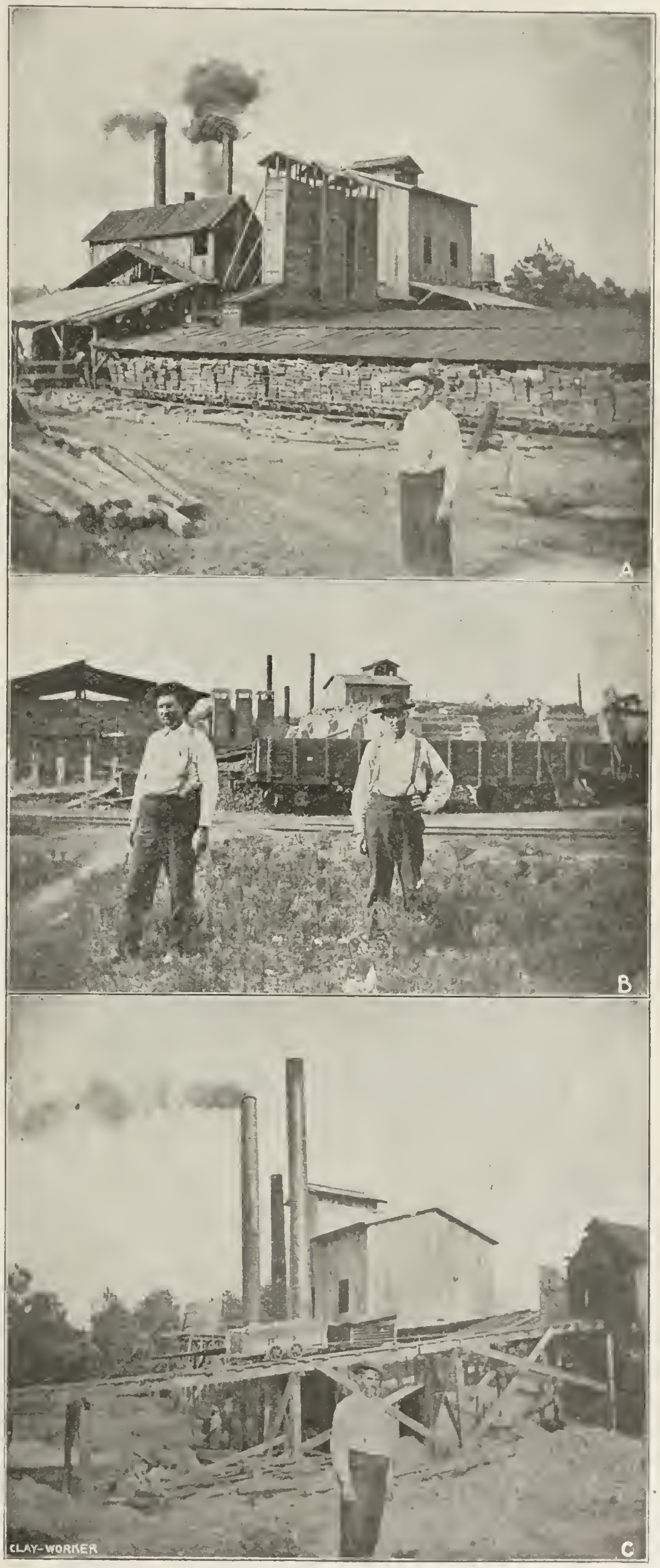
Birmingham, Ala., is one of the very busy sections. The remarkable revival in the iron world has set the wheels of industry to whirring as they have never whirred before in that vicinity. Every trade and industry has felt the effect of this revival, none so much as the iron business, but all to some degree. The building interests are much improved. There is no building boom in Birmingham, but the demand for brick and other building material is sufficient to keep the local yards running to their full capacity.

One of the busiest men in Birmingham is J. R. Copeland, who has two large brickyards, one at East Birmingham and the other at Pratt City. At the latter he has made extensive improvements the past season, putting in a complete Chambers outfit, having a daily capacity of 50,000 end cut building brick. Mr. Copeland writes that he thinks he is making by far the best common brick ever made in that section. From the machine the brick go to a tunnel dryer, and thence to the kiln the following day. The clay for these brick is taken direct from the bank, which is four feet deep, in tram cars drawn by mules to the foot of the incline, where a cable is attached and the load is quickly hauled up, dumped in a bin, from which it is fed into a pug mill, which in turn feeds it into the Chambers machine.

Mr. Copeland has added a Eureka dry press to this plant, having a capacity of 20,000 brick a day, and will in the future be a factor in the pressed brick market of that locality. The clay for the latter machine is plowed on an open field, allowed to dry, and then gathered in wheel scrapers, and then stored under immense sheds, from whence it is taken as wanted, and goes through the usual process of pulverizing, screening, etc., going direct from press to kiln. Heretofore all the brick at this plant have been burned in old fashioned up-draft kilns, watersmoking with wood or coke and finishing with coal, the entire process requiring two weeks. He intends to burn the dry press brick in up-draft kilns, by which he expects to accomplish a double purpose—burn better brick and use less fuel.

The Copeland yard, in East Birmingham, has a daily capacity of 25,000 hand-made gray brick. At both plants there are two railroads tracks running beside the kilns, affording excellent shipping facilities, as it gives access to five different lines of railroads. The average price of common brick the past season has been $5.00 per thousand f. o. b. cars at the yard, though some of the competing yards have taken contracts at a dollar per thousand less than that price.

Speaking of Mr. Copeland personally, the Birmingham Age-Herald says that he is a practical brick man in every sense of the word. He came to Birmingham when a mere boy, and entered the services of the late George Lunsford as a laborer, working at 90 cents a day. He began at the bottom round of the ladder, and it was not long before his employer recognized in him that merit which insures success. Step by step he went up until he attained the highest efficiency in the art of brickmaking. When Mr. Lunsford retired from the brick business his mantle could not have fallen on worthier shoulders than those of J. R. Copeland, by whom he was succeeded, and who now stands in the front rank of the brick men in that part of the country. Mr. Copeland's career furnishes a splendid lesson for the youth of the country, who would do well to emulate his example. He has been successful, and his success has been due to indomitable energy, good judgment, perseverance and upright dealings.



J. R. Copeland, his Foreman and Machine yard at Birmingham, Ala.

OBITUARY.

Prof. Edward Orton, Ph. D., LL. D., of Ohio State University, Died Suddenly of Heart Disease While Sitting in a Chair at His Home in Columbus.

Prof. Edward Orton, Sr., Ph. D., LL. D, of the Ohio State University, died suddenly the afternoon of Oct. 16, at his home in Columbus, of heart disease. He was sitting in a chair, and the end came so quickly and peacefully that he seemed to fall asleep.

Professor Orton was one of the most distinguished economic geologists of America, and was honored last year by election to the presidency of the American Association for the Advancement of Science, presiding at the Columbus meeting. He had been since 1885 State geologist, his official reports in that capacity forming a most valuable contribution to geological science. He was born March 9, 1829, at Deposit, Delaware county, New York, and received his early education on a farm. He graduated from Hamilton College in 1848, and studied theology at Lane Seminary. He was president of Antioch College when, 1873, he was called to the presidency of the Ohio State University, in Columbus. He resigned that position in 1881, but retained a professorship in geology. Several years ago he suffered a stroke of paralysis, but recovered sufficiently to continue his university work up to a few days ago. Dr. Orton was widely known as a lecturer having had the remarkable faculty of popularizing the science of geology.

Dr. Orton was married in 1855 to Miss Mary Jennings, of Franklin, N. Y., who died in 1873. Two daughters and two sons were born of the union, Clara and Mary and Edward and Charles. Dr. Edward Orton, jr., is professor now at Ohio State University. In 1875 Dr. Orton was married to Miss Alonzo Taft, of Cincinnati, who survives him. Two children were born of the second union. They are Louise and Samuel, the latter being a student at Ohio State University. The children all survive the parent.

In him were combined the deep thinking of the philosopher, the research of the scholar, the impulses of an honorable man, the manners of a gentleman, combined with infinite liberality, toleration and affability. As teacher, lecturer, college president and man he distinguished himself from his fellow-men without falling victim to the pride which too often goes hand in hand with greatness, and the State University will, next to his kith and kin, most intensely feel the loss occasioned by his death.

A SUCCESSFUL MISSOURI BRICK AND TILE PLANT.

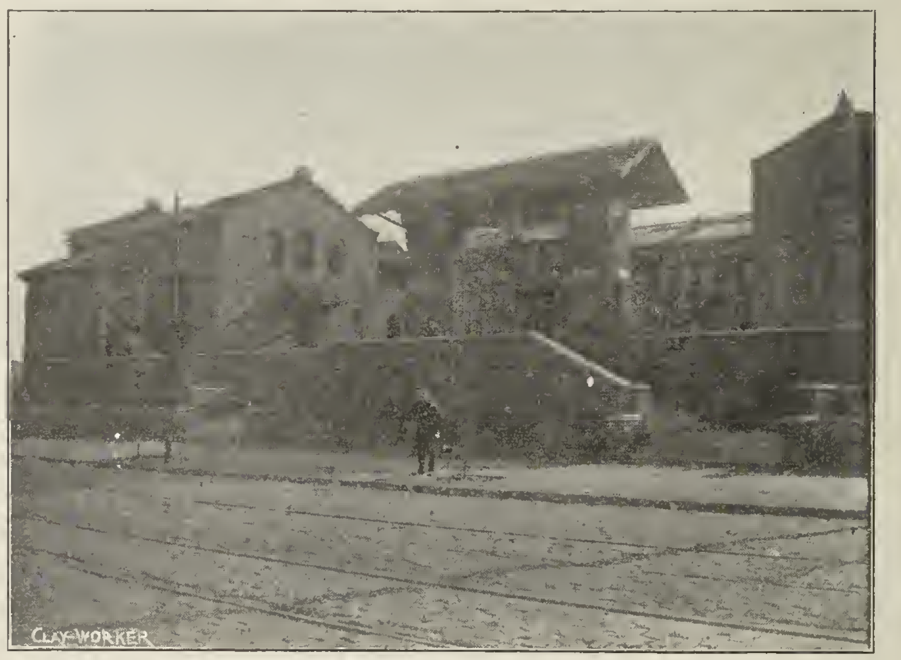
IN RENEWING their subscription to The Clay-Worker, the English Mining and Manufacturing Co., of Jackson, Mo., write that they have had a good season, the local demand for both brick and tile being better than ever before. They have also had a large demand from near-by points which they reach by rail. Their brick plant was established two years ago. Up to the present season they made both brick and tile on a Freese machine, and had good luck from the start. To meet the growing demand for front brick they added a two-mold Fernholtz dry press to their equipment this season, and have since been making 10,000 to 12,000 pressed brick a day, which they think will compare favorably with the best in the land.

They have a very fine bank of brick clay, from 15 to 20 feet thick, near their plant, and haul the clay into sheds. They also have a deposit of very fine white kaolin about a mile from their plant, which they ship. They use a small portion of the gritty and unsalable kaolin in making drain tile. When they put in the Fernholtz press they rearranged the building and put in a Fernholtz crusher, which they use to prepare the clay. They burn their brick in up-draft kilns in from seven to nine days. They burn their tile in down-draft kilns, using wood and coal for tile, but wood alone for brick. Any brick or tile maker who may at any time find himself in the vicinity of Jackson will find a cordial welcome awaiting him at the works of the E. M. & M. Co.

THE MUSEUM BUILDING OF THE PENNSYLVANIA MUSEUM.

The subject of our illustration presents one of the most unique and tuneful pieces of brick architecture to be seen within the confines of the City of Brotherly Love. Built in the form of the twelfth century Spanish architecture, it stands midway between South-street bridge and Thirty-fourth and Woodland avenue, a superb monument of the adaptability of clays to the inclement harshness of our winters and the obtrusive and insidious heat of our summers. As quaint, maybe, as a gray Quaker lady, but possessing in its exterior and interior form all the charms of modesty, all the sweetness of refinement, unmarred by any ferocious or vulgar ornamentations.

Rising from the sidewalk by some eight or ten steps, an entrance is made through the rich wrought-iron gates, beneath a porte cochere, built of heavy timbers and rafters, topped with the old Spanish tiles. The walls are of hard brick, with a three-quarter-inch course, lending a soft gray line, harmonizing well with the general exterior treatment. The courtyard is full of dignity and repose, the center being given up to a pool wherein reposes the Victoria Regina, converting it at once into a garden spot, green and cool, to which the shadows of the green trees lend a graceful shade and form to the framing of the grass plateaus.



The Porte Cochere, Pennsylvania Museum Building, Philadelphia.

The right and left wings to the main hall have been judiciously treated, without resorting to the introduction of any foreign material, such as stone or marble. The heavy roof timbers, carried out to the extreme of the broad Spanish eaves, are tinted in green, and this converts the tiled roof into a heavy sky line, that converges into the massive but dignified lines of the facade.

In all the general lines of construction of the many buildings lately erected in and about the campus of the University preference has been given to brick over the old form of stone, and with the most pleasing effect. MITSCHKA.

Brickyard Comics.

Bjenks: "What is the universal brickmakers' favorite breed of dogs?"

Bjunks: "The pug, of course."

* * *

"What was that the sweep log said to the machine?"

"It said that its work was a terrible grind."

Written for The Clay-Worker.

THE SMOKE NUISANCE.

THE BRICKMAKERS of the District of Columbia have been not a little exercised recently over the action of the Commissioners, which, in the building regulations, puts brickyards in the same category with establishments where offensive odors are generated, and therefore classed as nuisances.

This matter was referred by the Commissioners to Health Officer Woodward for investigation. In his report on the subject Dr. Woodward states that there is no regulation of the late Board of Health, so far as known to him, that refers especially to brick kilns. There is a law, which dates back to 1860, that includes brick kilns with slaughter houses, bone-boiling places and soap factories. The health officer's report says, in part:

"The effluvia from brick clamps and kilns are usually acid, irritating and injurious to vegetation. Clamp burning should not be permitted in populous neighborhoods. Kiln burning, if carried out in well-constructed kilns provided with a long chimney shaft, can be effected with but little offense."

It is possible that the building regulations relating to this important matter will be amended, notwithstanding the fact that Dr. Woodward's report seems to point to the contrary, ending with: "The foregoing considerations, based upon regard for public health, would, in my opinion, militate against the change proposed."

Mr. T. L. Holbrook, president of the Standard Brick Company and of the Washington Brick Company, addressed a vigorous protest to the Commissioners against the regulation mentioned. He calls attention to the impropriety and injustice in classing brickyards with slaughter houses and other establishments that can easily become nuisances and a menace to public health. The interesting fact is also set forth that the growth of the city is, to a great degree, dependent upon the production of building material with the least embarrassment, and that the manufacture of brick forms the largest industry in the District. Mr. Holbrook also states that unless the building regulations are changed large business interests will be affected, among which are those of the Washington Brick Company, new plans of which would be interfered with, and the plant at Fourteenth street and Florida avenue and one occupying two squares of ground in a remote and thinly settled section of the city would have to be moved.

And, after all this, we are moved to ask ourselves: Are we nearing a smokeless age, when the factory will fact without smoke and gas, and the locomotive mote without cinders and soot? Perhaps there will soon be found (in Washington) a brickyard bacillus, having a salt-glazed, terra cotta body, fine porcelain legs and a nipping power that will double discount the famous kissing bug. And the royal animal will stalk forth and bite—perhaps the Commissioners.

Brick and building business in the capital city is still quiet, and, of course, the price of material is still hovering around high-water mark. But work is going on in various parts of the city, and, some think, will continue through the winter. Others say the high prices must, if kept up, bring building operations to a standstill. One thing of interest to Washington people is that the past summer's work gave us a better class of buildings, in convenience and also in artistic effect. And we are following better ideas in sanitation. Nicodemus.

THE PERFECT CLAY SCREEN.

Merit will win, and The Clay-Worker is always pleased to note the success of a machine where merit has won for it an enviable reputation. And this can be truly said of the Perfect Clay Screen, illustrated on page 314. For the benefit of those of our readers who are not acquainted with this machine we wish to state that this screen is not a vibrating or shaking screen, but is a traveling gravity screen. The several plates form an endless sheet of metal, and it travels like a belt, screening while on the top sheet and cleaned when on the under side. If any of our readers have trouble screening their clay consult Elder & Dunlap, Bloomington, Ill., manufacturers of this screen, and they will provide a remedy that up to this time has never failed to operate successfully.

THE ILLINOIS CONVENTION.

Ottawa, Tuesday and Wednesday, Jan. 9 and 10, 1900.

THE FIRST brick and tilemakers' convention to be held the coming winter is that of the Illinois Clayworkers' Association at Ottawa Jan. 9 and 10, 1900. The indefatigable secretary, Mr. G. C. Stoll, writes that he is already at work on the programme and other details. Headquarters will be at the Clifton Hotel, where all visiting clayworkers will be welcomed cordially by the local committee.

Mr. Stoll writes that the brick and tilemakers of Illinois have almost without exception had a busy, prosperous season, and he anticipates an old-time enthusiastic crowd convention week. The Pioneer Fireproofing Construction Co., of Ottawa, one of the most extensive clayworking establishments of the sucker State, will be in operation at that time, and one of the features of the convention will be a trip through their plant. The clayworkers from other States are invited to attend the convention. Further particulars will be given in subsequent issues of The Clay-Worker.

G. C. Stoll, Secretary Illinois Clayworkers' Association, Wheaton, Ill.

The Growth of Man.

Observations regarding the growth of man have determined the following interesting facts: The most rapid growth takes place immediately after birth, the growth of an infant during the first year of its existence being about eight inches. The ration of increase gradually decreases until the age of three years is reached, at which time the size attained is about half that which it is to become when full grown. After five years the succeeding increase is very regular till the sixteenth year, being at the rate for the average man of two inches a year. Beyond sixteen the growth is feeble, being for the following two years about six-tenths of an inch a year; while from eighteen to twenty the increase in height is seldom over an inch. At the age of twenty-five the growth ceases, save in a few exceptional cases.—Exchange.

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

THE 1899 SEASON for the manufacture of common brick on the yards which ship by water to New York city is drawing to a close. It would be a safe business move if all who look to Manhattan for a market would mold the last pit for 1899 on the 30th of September. Yes, not only this year, but every year. The weather is generally good, and would be a benefit to the closing up, as the days lost in waiting for the green brick to dry consumes time and runs the cost of making above the average. Like all else connected in making brick, as long as the present way of ownership lasts no concerted movement in that respect may be looked for.

October in general shows some advance in rates, and the brickmaker wants it, and wants it the worst way possible. As he has done his utmost to reduce the price by free shipments, he seems to think that he can regain the loss by keeping at it, not seeming to consider that as long as making is going on the buyer is the one who will gain in the end. Providence he expects to take care of his interests and provide good weather, as some of the bosses have started, this, the last week in September, their last kiln. The past season has, as one looks back from month to month, shown a strange development in the brick business of this part of the country, and goes to prove that the average brickmaker is not to be compared for astuteness with men in the other lines of trade.

—The Season Opened Favorably.—

Before any move was made to pump out the clay banks this spring the building trade had no record of more prospective work than in years past, but good fair rates ruled for brick. Another factor that was in favor of the trade was a not over abundant surplus of stock, the result of the strike in Haverstraw. It certainly placed in the hands of the brickmaking industry that which they had always claimed they did not possess, that is, the regulating of the sale and consequent return of remunerative prices. The market would require stock just as soon as settled weather permitted the digging of cellars. Did he hold his stock under the shed and thus cause an inquiry from the dealer. No, he could not get them on the market fast enough with his own boats, but must get outside boats, and the market was well supplied and took all that came along, though early in the season, and he had the pleasure of seeing the price drop off instead of going up. I presume those engaged in making brick could not rest at night if prices did not contract, and he does not seem to have any idea of how to remedy the matter, but continue on in the face of one of the best prospects for a money making season that the trade has in many years.

—The Demand for Brick—

Has been good the entire season. I may say that it has been beyond anything in years past. Yes, a record breaker. When a hundred barges in a week has been taken off the market, with each load containing 250,000, and the majority of them more, some even 300,000, it certainly means a good demand. Since new brick came on the market the demand has taken from 70 to 90 loads a week right along, and, best of all for the buyer, they have been there for him to choose from, and from week to week, if he had a contract to fill, his pocket was benefited by a fall in price, and the brickmaker was doing his best to help him. If with such a fall for brick the price cannot be a six-dollar one, what must be expected with a dull market that must come.

The cost of making has been more than in the past three years, as wages are higher, the same with wood, coal and coal dust, and every brickmaker feels that his pocket is getting low by the fall in rates. To judge by the market pursued this, as well as other years, nothing more or less than he is doing—make all he can, mold as long as the weather will permit, ship as fast as possible, have his stock under the shed depleted by the close of navigation—this seems to be the brickmaker's idea. By the way, each one follows in the footsteps of the other. Like the sailor or soldier, growl at the small returns, and lay the blame of all his misfortune at the door of the agent. "Me" should get more for them. He knows he could if he tried, and many like expressions are heard each day. The saying that a sailor would die if he could not growl, so with the brick fraternity. It has become chronic, so that it seems that all he can do is to do all he can to push stock on the market, and then expect the agent, like the old man of the sea, to carry the load. The golden lined cloud of the spring of 1899 has assumed the same old somber hue.

—Talk of Consolidation.—

A revolution of the trade may be near; possibly next year may see the beginning, but not by the present owners. A great many think they will be able to sell to the new company, but they will find that they do not want their little holding, as only the best of improved property is the object. By a complete system of boring each piece of property from Albany to Hackensack, they have learned what the depth of clay is. With options on some which mature in December next the early part of the year will see active movements in the company. It will be a safe prediction to make that no such rates will prevail as have been the case this season with the demand calling for brick. The returns will be of a good paying nature, or if the independent manufacturers try to take advantage of the money and ability of other parties there will be a squeeze in rates that will be remarkable. As others have done, others will do, viz., Standard Oil Company and like organizations.

—The Queer Brickyard Strike—

Mentioned in the September issue only goes to show that the brickyarder of the East, or some of his descendants who have heard the head of the family repeat to receptive ears how he and others had "kicked" on the grub, have invaded the far West. Along the Hudson, above Haverstraw, it was for years the custom to pay so much per month and grub. The result was that the men were always grumbling, and one place in particular was noted for such kicking. As a sample, when the whistle called the men to work after dinner one day not a man went to work. When asked what the trouble was, "the meat was too tender." That was the only cause, and it was the especial care each day that it should be thoroughly cooked, so that there should be no growl about its being "tough." On the same yard one Friday morning after breakfast not a man would go to work. Why? Because there was not enough codfish cakes, when but a few moments before they were heard to say how good they were, and several said that they had got away with ten. I could repeat many instances of just such trivial causes. The brickyarder is a great traveler, and he is being heard from in the West.

—The Sod Pit—

Is in general use on the majority of the yards in the States. When the clay is soft and plastic one is all that is required. Where the clay is hard in some places a double pit is used, so that the one may be soaking when the other is run out. With the advent of the elevator the double pit for hard, stubborn clay is found best. On pallet yards the sod pit is a thing of the past on many yards, as the single pit is superseded by the running of one machine all day, or, say, till the same number of brick is on the pallets. At present the old pit is filled in, even with the top of the curb of the pit, and then a bottom of two-inch planks laid down, and the clay is brought from the bank by a horse and cart and dumped against the machine, so that it makes handy shoveling for the shovelers. In times past if that method had been mentioned the argument would be raised that the stuff would not be properly mixed with the sand. It only required some one to start the ball rolling, the rest would fall in.

—Brickyard Refuse.—

Is there such a thing on a brickyard as refuse? Yes and no. The bats serve a purpose in several ways as well as the litterings, and the last named have the call when the clay is of the quicky order to throw in the tub to stiffen the mud. How about the bank? At present no, in former years yes. The manufacturer of good brick would strip off and throw away, so to speak, the top stuff that was not good strong clay, just as some men who wanted to give their brand of brick a good name would take out all the arch brick and heading course. They would get about 25 cents more than their neighbors. To-day there are brick being made out of the strippings which were formerly thrown away, and there is no fault found by the buyer. It all goes in the New York market. The percentage of waste around the burnt kiln when loading in no more, apparently, than when the best of clay was being used.

—An Improvement on the Walled Kiln.—

Another innovation, and a good one, is in use on some yards. The one objection by many is the walled kiln. To have it daubed properly is a hard matter, as all know who have been around a kiln when it is hot. The daubing will drop off and crack in case of the double wall as well as single. To tell a man with a pail of thin daub to go around the kiln and stop cracks is not a comfortable job for the man, and the boss looks at the work being done and counts the cost. The time taken to do it comes high, but it must be daubed or the heat will be wasted. The plan now tried by some is to set up inside of double as well as single walling a course of pale brick on edge from top to bottom. It acts as another wall, and helps cover the cracks which come in a single wall, thus making nearly seven inches from the outside of the wall to the head of the green brick.

Heads of green kilns are set up more uniform than in times past. The patent kiln head setter is in use on many yards. On the yards which still set up as of old the setter takes more care and carries the head of the green arch more in line with the next one, with the result that when one looks along a 15 or 20 arch green kiln head it is not like the waves of the sea. It has not been unusual in counting the width of the green kiln to find where the width of the kiln ground is permitted to set 50 wide to find the width vary a brick, 49.2 brick, 49.1, and even 49 wide. The landlord calls it all 50 wide, the rent "only" $1.20 per thousand. The counting course would be the twenty-fifth.

—A Large Plant.—

If the report that is in circulation has any truth in it, or if anything like the proportion mentioned in said report is maintained in the building of the plant which the American Brick Co. is credited with, it will prove a factor in the trade. The locality where the property is placed has plenty of material, and the plant, so the saying is, will have an output of 150,000,000 per year. This, of course, will require a large acreage.

—The Brick Market.—

The market has been all that a shipper could desire, so far as taking stock is concerned, and the returns should be better, especially as the season draws to a close. Why do the rates fall? Do not ask me to venture an opinion. I think there could be more diversity of opinion offered on that subject than would fill the columns of The Clay-Worker. The stubborn fact remains that the call is good and the price falls, while in the iron trade the demand has advanced the price, with brick forced down. Great is the tide water manufacturer of common brick. A few days ago one manufacturer asked another craftsman what he thought caused the price to go down. The same old chestnut; it was because they did not try to get more. One said, my barge has gone in the last three trips to ——— street, and everybody comes and gets what brick they want, and then settle for them at $4.87½. Echo says the Dewey holiday of two days will cause a full market, and what then?

Haverstraw, $4⅞ and $5⅛ special.
Newburg Bay, $4⅞ and $5⅛.
Up Rivers. $4¾ and $5.
Hackensack, $4⅞.

A. N. OLDTIMER.

DETROIT DOINGS.

THE F. H. WOLF BRICK CO. has lately installed an elegant new Chambers machine of fifty thousand daily capacity, and one large Martin machine, which, with the aid of a new Atlas engine, battery of boilers and improved standard steam dryer, gives them one of the finest plants in this section, with a daily making capacity of fully half a million.

The Hall Brick Co. have been running their plant to its full capacity. There is talk of their putting in an artificial dryer and making other improvements the coming year.

The firm of George H. Clippert & Bro. have also been increasing their facilities somewhat this summer by building and equipping a complete new yard, which has lately begun putting brick on the market.

Messrs. Clippert & Bro. have shown themselves fully worthy of their reputation for push, energy and business ability. Their new plant is equipped with a Monarch machine and other supplies from Wellington, O., an A. B. C. steam dryer and all the etceteras of an up-to-date brick plant. They are now operating the new plant, and are much pleased with it.

Conrad Clippert, the founder of the business now conducted by his sons under the firm name of George Clippert & Bro. Brick Co., has just returned from an extended trip to Germany, much improved in health. He will be able to tell his old friends during Convention week many interesting things about the old country.

Nearly all of the yards at Springwells have run most of the season. Some have already closed down and others are burning their last kiln. The year's work is fairly satisfactory, but a still better season is anticipated in 1900, and it will surely be realized if nothing occurs to interfere with the local exchange, through which a reasonable price will be realized on what brick are sold. The prices this year have averaged about $6 for all hard builders.

The local brickmakers are much interested in the proposed meeting of the National Convention, and will show visiting brickmakers a good time if they will meet here this winter.

Builders in general have found themselves very much handicapped here, as elsewhere, in the construction of large buildings by the scarcity of iron, several large contracts being at present completely at a standstill on that account.

The brick paving in Detroit this year has been confined to one street—West Fort—with the exception of a few small alleys.

West Fort street will, when completed, be one of the finest pieces of work in the city. Messrs. Lenane Bros. are doing the work, and will use fully two and half millions of Nelsonville block in the job.

BOATMAN.

DETROIT, Oct. 14, 1899.

C. A. Potts & Co., Indianapolis, report satisfactory trade conditions. The demand for their standard brick machinery, mold sanders, disintegrators, etc., is keeping them very busy. Among recent orders they mentioned that of a complete outfit for the Dominion Iron and Steel Co., of Boston. The plant is to be erected at Cape Briton Island, Canada. Another plant is now being shipped to Kilgore & Moore, Matthews Ind.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Brickdust—Kilns and Kiln Construction.

Editor Clay-Worker:

Brickdust has been the predominating dirt covering my clothes for the past ten years, and during that time I have been a constant reader of The Clay-Worker, of which I cannot speak too highly.

Received my first lessons in brickmaking under a most competent instructor. We used down-draft kilns with chimneys, and later used some kilns with a stack. During nine years of continual use of down-draft kilns I came to believe there were no others, except continuous kilns, which were thrown in as dessert, and were very fine.

But the past year has brought me in direct contact with the much-hated up-draft kiln. Am very much impressed with the most excellent results which may be obtained in the up-draft kiln. However, I do not think it practical to build up-draft kilns with crowns as described by L. C. M. in the August Clay-Worker. The cost would be almost identical with the down-draft kiln of same capacity.

Again, I do not think "Press," who criticised L. C. M. in the September Clay-Worker, is right in advocating that up-draft kilns should be built 28 and 30 feet wide. The difficulty in burning an up-draft kiln is to reach the center with sufficient heat to bring the settle at that point even with the sides or quarters. If the kiln has large ports or furnace throats from fire box to arch, and the arch be twelve inches, the difficulty in reaching the center will be increased. If, on the other hand, the ports be small, say nine inches wide by twelve to twenty inches high, and the arch be set nine inches wide, and either three or four brick benches, the center of a wide kiln may be reached with the heat, and an even settle will be the result. Twenty-two feet is a wide kiln. I do not believe you will find very many men who earn their living by shoveling coal into an up-draft kiln that would favor a kiln wider than that indicated above.

Up-draft kilns should be eighteen to twenty-two feet wide, and the brick set not more than forty courses high. The arches should be nine inches wide, and be closed on the twelfth, thirteenth or fourteenth course. The benches may be either three or four brick wide. The kiln may be any length desired. Fifteen to twenty arches makes a nice size, and gives a capacity of 175,000 to 250,000. The burning can be done as cheap in this style of kiln as in any down-draft kiln.

I do not agree with L. C. M. that "any tinker" can build one of these up-draft kilns because they are cheap, but a good tinker might do so with some degree of success. ITHAMAR.

Maine's Mudyards Wound Up.

Editor CLAY-WORKER:

The last brick is not yet struck in the yards of Maine for the season of 1899. It was the best season for weather, from beginning to close, that was ever experienced. Northern Aroostook yards were not so fortunate, as it rained very much from beginning to end. At Ashland, Dan Mullen has made quite a large kiln, perhaps 600,000 in all. Seventy-five miles south, at Presque Isle, Martin B. Dunn, for the Aroostook Lumber Company, made 800,000 good brick. Seventy-five miles farther south, at Sherman Station, M. & J. D. Leen made and have burned 400,000. All of these Aroostook brick will be shipped to Millinocket, thirty miles south of Sherman, to enter into the construction of the big paper mill there.

In Brewer about 10,000,000 have been made, Hugh O'Brien leading off with 5,000,000 sand-struck brick, and Samuel A. Holyoke a close second with 4,000,000 water-struck brick. Wm. Burke made 1,500,000. In Bangor W. S. Hellier has made 2,000,000 sand-struck brick. More than half the output of Brewer yards will go to Millinocket. The remainder, with nearly all of W. S. Hellier's output, will be used in Bangor. Prices range from $6 to $6.50. The central and southern Maine yards have done an unprecedented business. Horace Purinton's yards, at Fairfield, Winslow, Augusta and Rumford Falls, have been pushed to their utmost capacity, and an output exceeding 5,000,000 will be used before spring by Mr. Purinton in his own building contracts.

The two large business and office buildings started in Bangor last spring are being closed in. The Bass Building, at the corner of Franklin and Hammond streets, is of buff brick from Trenton, and is a five-story picture in brick, facing the handsome red brick new City Hall. The Morse-Oliver building, seven stories, is delayed on account of some trouble in getting the red front brick from Philadelphia. The brick come in barrels, packed in straw, which makes down-East brickmen look queerly at the performance. The Morse-Oliver Building will be a handsome and imposing structure. The red brick will be set off with granite trimmings.

Judging from delays in getting material, brickmakers, as well as iron manufacturers, west of New England, have been on the jump, as they have been in the East. There has not been a bad or mediocre burn in Bangor or Brewer this year among probably forty kilns in all. It speaks well for the veteran burners who did the most of the burning—Henry A. Harlow, John Flannigan, Dennis Flannigan, Felix Sherman and Alvin L. Holyoke.

The prospects for another year were never so good. Wm. Burke is just closing in a twenty-nine-arch kiln. Hugh O'Brien is still striking with his two Martin machines, at his Brewer yards, and says he will strike till snow flies or drifts. It snowed a flurry here to-day at 2 o'clock. How would my Southern brothers like to stick their hands in water with the air full of snow. BRIAN J. DUNN.

BANGOR, Oct. 5, 1899.

What Kiln Shall I Build?—Furnace Construction.

Editor Clay-Worker:

It was with much interest I read "Flame's" valuable paper, "What Kiln Shall I Build?" No. 7. However, as the writer's opinion differs in some respects to the views set forth in the paper, I enter upon the subject not to criticise or find fault, but to give my personal experience in furnace construction.

There has been a great deal said and broad claims made about the value of air chambers around fire boxes which, in theory, seems all right, but in actual practice these results can not be attained. Very true, if the right quantity of air could be admitted through these air chambers at all times, there would be much benefit derived from them. The great trouble with these air chambers is to regulate the supply of air needed to obtain the best results. In the first place, there is no question but that a furnace, just after clinkering and cleaning out, owing to the free admission of air up through the grates, requires less air to be admitted over the fire than it did just before cleaning the furnace. Now then, to obtain the best results with the air chambers, begin just after fires have been cleaned, as the time passes it will be necessary to gradually increase the supply of air through the hot air chambers in about the same ratio that the supply of air is cut off from passing up through grates, owing to the accumulation of clinkers and ash, until it is time to clean fires again, when the air chamber inlets should be closed to a minimum.

Then again, if the proper amount of air is admitted through these chambers just after firing, which is the period the air is most needed, there will be too much air entering the furnace to meet the requirements as the fire burns down, and the advantages derived will be more than offset by the fuel it will consume to heat the surplus air to the temperature in the kiln.

It is a question with me whether the air passing through these chambers only absorbs the heat that, as "Flame" says, would pass through the walls and be lost, or whether it actually takes some of the heat out of the furnace. My opinion is that a portion of the heat that raises the temperature of the air in the chambers is taken direct out of the furnace, which would otherwise pass into the kiln if there were no air chambers, therefore would not be actually all gain. The writer has experimented in various different ways with these air chambers, some of them being almost identical to the ones explained in "Flame's" paper No. 7, and in every case found the results to be at the expense of the fuel bill.

It is a very difficult matter to determine during the different stages of the burning how much air should be allowed to pass through the air chambers, and, if known, how is it to be regulated to meet the existing conditions?

In a summary of experiments made in England, published in Bourne's large works, Steam, Air and Gas Engines, it is stated that combustion of black smoke by additional air was a loss. In all experiments the highest results were obtained when all the air was introduced through the fire bars. The furnace that will accomplish the best results, according to my opinion is one that will permit of charging, clinkering and cleaning out without the admission of large quantities of cold air; will not necessitate covering of the entire grate surface with fresh coal at each fire, and one that will maintain bright, clean fires from start to finish of burn, so as to allow what air is needed to pass up through the bed of live coals.

S. H. ALSIP.

St. Louis Notes.

Editor Clay-Worker:

St. Louis brickmakers can well grumble at the fates that have thus far controlled the market this year. Last spring there was a good, healthy, encouraging demand, and the market stood the advance in prices, that was warranted after the years of starvation that had sorely tried the strength of the strongest. But the weather clerk lost control of his stop valve, and the frequent rains so interfered with harvesting clay that all the yards ran out of clay. A famine threatened the builders, and arrangements were being made to ship out-of-town brick. Then the weather clerk took compassion on ye brickmaker, but it was too late; the cry had been raised of famine brick prices, and the scare got in its work, with the result of clay sheds bursting with the bounteous harvest from nearly three months of ideal clay harvesting weather—but no brick buyers.

The iron and hardware men have also done their share in stopping all speculative building, and frightening off most of the legitimate building, by the very heavy advances they have made in prices. It was hoped that prospective builders would come into the market this fall and accept the high prices, but thus far they have refused, and the building trades are terribly dull. This was well shown in the bids the other day for some additions to the city schools, in which more bidders appeared, and at closer figures, than at any previous letting.

The Sixteenth Annual Exposition opened last month, and it promises to regain its old-time popularity this season. The St. Louis clayworkers are represented by the Hydraulic Press Brick Company, the Winkle Terra Cotta Company and the Standard Tile Company. The hydraulic exhibit displays all the innumerable designs and colors in stock, ornamental and enamel brick, and a very attractive series of brick fireplaces and mantels. The Winkle Company has three duplicate series of decorative panels, illustrating industry and art; one set is in dark red, with a dead surface, and is very much warmer, richer and more artistic than the duplicate set in white enamel. The latter may be easier to keep clean, but, after cleaning, you still have a cold, unattractive thing, which always looks cheap in its shiny surface. The red goods may get dirty and grimy in time, but so will all things if no attempt is made at cleanliness; but when you do clean them, as is easily done with vitrified terra cotta, you restore a handsome, attractive article.

The Standard Tile Company exhibits a complete display of English, French and Spanish tile, in mainly red colors, but also in white, grays, brown, yellow and green. Their terra cotta trimmings are very complete, and contain several original designs.

"LOUIS."

The Chicago Situation.

Editor Clay-Worker:

As a medium might characterize an unsatisfactory seance as "conditions were not satisfactory," so could the material man and contractor sum up the Chicago situation for September.

Unsettled labor conditions are bearing their legitimate fruits, and an abundant harvest of "shelved" business in the architect's offices attest to the sensitive qualities of capital, when this particular condition obtains.

With the exception of a few heavy transfers in the heart of the city, real estate is on a par with improvements. Several auction propositions, notably in the southwest section of the city, have been fairly successful and entirely void of speculative features, as home-seekers are the purchasers, which argues well for the brick trade later, as the wage earner is not the one to carry unimproved property.

A number of manufacturing plants in the suburbs are enlarging, which points to activity in lines other than the building industry.

A thorn in the side of the paving brick interests at the present time is Mr. "Bob" Givins, of the Taxpayer's Association. It is a question whether or not his association is a meritorious one, so far as conserving the best interests of a community. Some men require the spur of a special assessment to keep in line with their more progressive neighbors, who would improve through the principle that money makes money, and good streets, walks and sewerage conidtions are more potent advertisements than special trains, brass bands, Sunday excursions and—prairie lots. Mr. J. L. Cochran, of "Beautiful Edgewater" fame, is a fair example of the progressive type.

Mr. Givins cited the city of Brazil, Ind., as a fair comparison of what could be done in brick paving, claiming cost per 25-foot lot at about $90.00, claimed to be at one-half of Chicago prices. Of course it necessitated a junket in a small way, and our superintendent of the bureau of streets, Mr. Doherty, is now preparing a formal statement of the investigations of the committee. They find that conditions which obtain in the Indiana towns are entirely at variance with Chicago conditions. Slag which is used in the places visited, as a foundation, at a cost of 15 cents a cubic yard, would cost 75 cents in Chicago. Again, Chicago soil is not adapted to this style of foundation, were the material available. The paving brick at Brazil would not be accepted here, and as a supply for our present needs, the Terre Haute dealers would be unable to furnish any before next March, and then at no better prices than are current with us at the present time.

Mr. Givins has prepared his report for the real estate board special assessment committee, and it's dollars to doughnuts that he recommends any and everything in the way of cheap work, irrespective of business principles. Honest, conscientious efforts towards staying a lavish expenditure of public money is commendable, but when the effort is directed in a way that it is an obstruction, its force is lost and the small property-holder is in a sea of doubt and despair, but nine times out of ten he will pay his $1.00 membership fee to the Taxpayers' Association, and then he can fight any and all assessments at a maximum cost to himself of $5.00, all managed by Mr. Givins.

So much for the prosaic condition, not a word in regard to our "hurrah" week, otherwise known as the Fall Festival.

Fireworks, electrical effects, decorations, notables, all fail when compared to the Herculean efforts of Messrs. Gubbins and Sullivan, of the United Order of American Bricklayers and Stone Masons, No. 21, B. &. M. L. U., of Chicago, in their successful bout with the Fall Festival committee in the corner stone controversy. The first coup by Messrs. Gubbins and Sullivan was to elect as an honorary member of their organization President McKinley, issuing to him a regular working card for July, August and September.

I have my information from a reliable source that not since the news of Manila has the bosom of the Executive been filled with such conflicting emotions as when on that peaceful early autumn morn, with the miasmatic mist from the historic Potomac (or the historic mist from the miasmatic Potomac, as you will) slowly dissipating by the struggling rays of old Sol, a messenger in the United States postal service was speeding up Pennsylvania avenue to the White House, bearing an official envelope with the Chicago postmark, seal of Local Union No. 21, B. &. M. L. U. of Chicago, and last, but not least, an emblem pasted at the upper right hand corner, which was the primary cause of his "hustle," viz.: a ten-cent special delivery stamp. Secretary Cortelyou, arriving at the same time, and recognizing the importance of the communication, immediately secured an audience with the President, who, by the way, does not hold to conventionalism when matters such as this are at issue. After a brief conference with his secretary, the President decided that a special cabinet meeting was not necessary, as the perverse actions of a certain Charles Traux and John Barton Payne, the latter said to be a judge or something or other, were such as to leave the acceptance of an invitation, and possibly the receiving of one, a matter of doubt. History records the fact of the total rout of the Lilliputian efforts of the aforesaid Traux and Payne, and one or two newspapers who offered them their feeble support, and Messrs. Gubbins and Sullivan were the proud bearers to the President of an invitation asking him. in the name of organized labor, to direct the laying of the corner-stone of the government building, at Chicago, Oct. 9. The press have pictured in feeling terms the fervor of the President's acceptance, and it remains for your correspondent to record, in a few brief words, the impressive ceremony.

At 9 o'clock the eventful morning of the 9th, Messrs. Gubbins and Sullivan arrived at the southeast corner of the government building, and after inspecting the preparations of their subordinates and approving same, they were driven to the Auditorium, where they were given audience with the President. Messrs. Gubbins and Sullivan then gave their permission to the committee in charge of minor details for the procession to start on its triumphal march to the government building and the attendant ceremonies. Promptly at 10 o'clock Messrs. Gubbins and Sullivan, with the President between them, followed by minor members of the committee and numerous lesser notables, marched to martial strains from the carriages to the platform erected for the purpose, and arranged themselves in crescent form, with Messrs. Gubbins and Sullivan, the President and the corner-stone base in the center.

After a few desultory remarks by a person seemingly in authority, Messrs. Gubbins and Sullivan held a whispered consultation and, in response to a secret signal, workmen appeared, bearing hod, trowel, hoe, mortar, etc., and at the same time the crane arm, as an inspired object, slowly swung the much disputed stone until it hung motionless over its resting place. An awkward wait of some forty seconds then ensued, owing to the fact that the President had mislaid his membership card which elevated him for the time to the exalted position of honorary member of Local Union No. 21, B. & M. L. U. of Chicago. The truant card was at last located among a bunch of defunct menu cards, and after same was inspected by Messrs. Gubbins and Sullivan, merely as a matter of form, the President was allowed to grasp a trowel. He plunged it into a pail of mortar immediately, and with a graceful swing landed the most of its contents in the proper place. Murmurs of applause arose from the assembled thousands, the stone was slowly lowered into place, and the festivities of the day were auspiciously opened. While Messrs. Gubbins and Sullivan and several of the committee who were near enough to participate were cleaning the mortar from their clothes, a committeeman at the farthest edge of the crescent dispatched a small boy with a dinner bucket and a dime on some secret errand, but the boy was evidently lost in the crowd, as he did not return. I understand from one near to Messrs. Gubbins and Sullivan that the President will not abuse the privilege conferred upon him and use his card to the detriment of the craft, as affairs of state, upon his return to Washington, will recall him from his pegasean association with No. 21, B. & M. U. L of Chicago.

Thus is recorded the successful termination of what at one time appeared an unsurmountable difficulty, starting as a cloud no larger than a stonecutter's chisel on the horizon of the Fall Festival committee. Labor is vindicated, everybody happy, whoop! VERITAS.

Brick Pavements—Good and Bad.

Editor Clay-Worker.

We congratulate The Clay-Worker that the articles on Chicago and Terre Haute pavements which have appeared in its columns have already borne some fruits, and we may only hope that the ball which has been set in motion may keep rolling until a reform in the manner of laying brick pavements has been realized.

It seems that a portion of these articles was copied by the daily press of Chicago, and, as a result, a committee of Chicago business men were appointed by the Real Estate Board of that city to visit Terre Haute and other places, with a view to a careful investigation of the matter.

We shall now only refer to a report of that committee as it related to Terre Haute pavements, and it will be seen at once that the position taken, as presented in the columns of The Clay-Worker, concerning the high character of these pavements, as against any to be found in Chicago, is fully indorsed by said committee, who, as reported in the columns of the *Inter Ocean*, were still more extravagant in their praises of what is to be seen in Terre Haute. While much praise was bestowed upon the character of the brick employed, we shall content ourselves with singling out what appertains to the matter of proper laying of brick pavements.

There are many makes of first-class paving brick in the market, and the methods of determining their character by actual tests are not wanting in thoroughness, but when it comes to the proper or best method of laying them there is a lamentable lack of knowledge, and in the use of improper methods the best of material is often misrepresented and abused. Often the manner of laying means practically a continuation of the rattling test, and this in a double sense, as they are so laid that vehicles rattle over them and are themselves converted into rattle boxes, to the disgust of those whose homes or places of business border the streets so mislaid. The pavers are themselves, in the meantime, being robbed of half, yes, often three-fourths, of what should be their normal life and usefulness. Paving brick will not be given their proper and deserved place in the public eye until a sweeping reform takes place in this regard.

We were recently told of an engineer, who occupies a prominent position as such, who, in overseeing a job of brick paving, instructed his subordinates to mix the cement and sand in proper proportions and to supply water merely to wash it in as a filler. But the trouble is not confined to the failure to treat cement properly. It is more frequently shown in the preparation of foundations, in the proper setting of brick on these foundations, and in the final rolling to secure a true face and alignment and proper compacting.

Referring especially to the Terre Haute pavements (the committee visited Brazil also, which came in for a share of commendation), the report says: "The Terre Haute pavements pleased the committee best. They were laid of brick, laid on concrete, with thin cement, known as 'grout,' poured in between the brick instead of sand or tar, as used in Chicago. The excellence of the pavement and the durable qualities are not credited by Mr. McLannan to the cement between the brick. He says it is due to the fact that extra good brick are used, well laid on a good foundation; this causes the brick to wear squarely and evenly. In Chicago they twist and get crooked," etc., etc.

South Fifth street was paved with brick six years ago. During that time it has, according to the notes of R. C. Givens, from the statements of the people there, an average of 5,000 teams passing over it each ten hours, yet to-day it is in perfect condition. "Looking down the street one would be sure it was made of asphalt," said Mr. Givens yesterday. "It was as smooth as any pavement I ever saw and as hard as one could wish. It has been growing smoother and better for years. I have never seen anything like it in the pavements of Chicago or elsewhere."

Mr. McLennan was equally enthusiastic over the street. "It is the finest piece of paving I ever saw," he said. "Although it has been there for six years, it doesn't show a flaw." Brick pavements in other cities used for any length of time have scarcely a brick that does not show a flaw. Tippecanoe street was laid four years ago. It is in perfect condition, say the members of the committee, and is improving every year. But Walnut street was the one which made Mr. Givens most envious of the Indiana men and methods. (Mr. G. no doubt referred to Sixth street, from Walnut street south, now nine years laid.) The roadbed is thirty feet wide, and is paved with brick. At the same time this was done the contractor built stone sidewalks and put in Bedford stone curbing on both sides of the street. The entire work was guaranteed for twenty years. The cost was about $62 for a twenty-five-foot lot. In Chicago the cost would be about $150 a lot. We copy this last item to show that the quality of work done has not entailed extra expense upon the taxpayers.

We hail as a good sign this awakened interest in one of the chiefest of municipal problems which affect the taxpayers of our day, as thus evinced by the appointment of a citizens' committee representing the real estate interests of our Western metropolis. The people must take a hand in the advancement of such interests, and it is to be noted that the unofficial committee referred to had influence enough to bring their city engineer into the investigation with them.

We cannot accept the conclusion arrived at by Mr. McLennan in not ascribing due credit to the cement filler. The streets visited could not have maintained their perfect alignment and their smoothness without such filler. As we have said in former articles, the tar filler runs into the gutter under a hot sun to such an extent as to leave the joints partly open, and both tar and sand fail to support the edges of the brick against chipping, which a first-class cement filler in large part does. This gives the street its asphalt appearance, alluded to by Mr. Givens. The committee is wrong, too, in concluding that the brick used in Terre Haute are better than those used in its own city. The superiority of the Terre Haute pavements is due wholly to methods of construction. When the Chicago pavers use the same care in laying their brick that is required in the Hoosier city they will get the same results, and not till then. Scribe.

Cincinnati Brick and Building News.

Editor Clay-Worker.

There is a decidedly better tone in the building interests in Cincinnati. Since Aug. 1 there has been a decided increase in the building permits. During June it looked as if the year's business would not amount to much, but now a good fall trade will be sure; in fact, the brick manufacturers are busy, and builders consequently more cheerful. There is also a feeling of confidence in the building line and all branches of business, which forebodes a continuance of busy times. It is expected with the plans on the tapis that next spring will show a veritable boom. The machine shops are so busy that one big brick concern had to stop for a few days before they could get their repairs.

This old, conservative town, with plenty of capital of its own, is slow to move and always last to throw off its business lethargy, but it is going ahead slowly and surely. Ground has been broken for an immense seventeen-story building at the corner of Fourth and Walnut. The city is quite proud of her second sky-scraper, and this will stimulate other large structures in the neighborhood, as ground is too valuable to keep small, old-fashioned and nondividend-paying structures upon the sites. There is also a removal of the wholesale stores from the bottoms to the next higher level, along Elm and Fourth and Fifth streets, where they will have new and commodious quarters. The bottoms are to be given over to railroad facilities.

Cincinnati has now the finest machine shops in the world, and her exports of fine machinery go to all parts of the world. Her suburbs are developing where ground is cheap, with good light, and a score of factories have been erected along Spring Grove avenue and the North Side. A large fancy grocery house is being erected on Fountain Square and a new theater on Walnut street. Norwood, a suburb, is building up fast. The United States Playing Card Company, the largest in the world, is erecting an immense structure there, calling for considerably over three million brick. Also the Globe-Wernicke File and Cabinet Company has removed here from Grand Rapids, Mich., and is building an immense factory. There is a great demand in Norwood for dwelling houses.

All the brick manufacturers are busy and have all they can do this fall. The J. M. Blair Brick Company, furnishing brick for the big Kroger grocery warehouse, on Hunt street, which will be eight stories high and 250 feet long by 60 feet wide, has many other orders ahead. The Mitchell Brick Company is furnishing brick for the United States Playing Card Company and other large contracts, and has all it can do. The Westwood Brick Company has all its brick sold for this season. It furnished brick for a large sewer in Camp Washington. The Cincinnati Brick Company is running, and has all the orders it can handle for 1899. Geo. H. Bruns has had his share of orders. The Busse Brick Company is running full capacity, and has its brick all sold for this season. The Batavia Brick Company has added common brick to its manufacturing department, and shares in the revival of prosperity. B. W. B.

TRIBUTE TO THE MEMORY OF DR. EDWARD ORTON, SR., PROFESSOR OF GEOLOGY, OHIO STATE UNIVERSITY.

A noble man has gone from us, one who has given to science and the world the results of an enormous amount of unselfish labor and who, by his example, has inspired hundreds of young men and women with the love of truth and high ideals. With a character so mild, pure and just that he was beloved by all who came to the University, he exerted a powerful beneficial influence upon this institution. No man's name was more highly respected, none regarded with more affection. Even the most rebellious minds softened in the benign presence of Doctor Orton.

Although we, of this University, claim him as our very own, our feelings for him are shared by thousands of the citizens of this State. It is good to know that he was appreciated by his co-laborers. The College has honored him by making him president, the American Academy for the Advancement of Science by bestowing upon him its highest office. It is not necessary to speak of what he did for his beloved science; his large contributions to scientific literature, his explorations of Ohio's great mineral treasures, his popular lectures, and the great number of students trained by him are witnesses which need no words. The clayworkers of Ohio owe him a debt of gratitude for advancing their interests directly and indirectly, and the students of the Department of Clayworking and Ceramics whose teacher he was have been made the richer by his instruction and the inspiration of his teaching.

We who have known him mourn him in our hearts, but find consolation in the fact that his was a glorious life which will stand as a bright beacon to mankind; and now he has entered his well-earned rest. A. V. Bleininger.

Department of Ceramics, Ohio State University.

TRADE LITERATURE.

"It's All Right," is the caption of an attractive little booklet received from the Joseph Dixon Crucible Co., Jersey City, N. J. It tells all about Dixon's Ticonderoga Flake Graphite and its advantages over oils as a lubricant for cylinders and valves, being more effective and at the same time more economical. Engineers will find it interesting reading. Copies can be had free by addressing the above firm.

The U. S. Rocking Grate is well illustrated in a pamphlet received from the Rocking Grate Bar Co., 225 Dearborn street, Chicago. These grates are real fuel savers and labor savers as well, for where they are used no pokers or slice bars are needed. Many of the large clayworking establishments of the country are using them under their boilers, and claim they are a decided improvement over anything they have used heretofore. Those having an eye to economy and convenience should investigate these grates. A postal card addressed as above will bring full particulars.

We are indebted to John Wiley & Sons, New York, for a copy of a new revised edition of "Masonry Construction," by Ira O. Baker, C. E. The publishers say that this, the ninth edition of this standard work, is a very great improvement over former editions. The chapter on cement has been entirely rewritten, and contains the latest results in manufacture and testing. Other chapters of the book, for instance that on mortar and concrete, have been revised and enlarged, making the book more valuable than before, and it is a standard work, which should find a place in the library of very engineer and contractor of masonry work. It is handsomely bound in cloth, and will be mailed postpaid for $3.00.

"Thurber Brick" is the subject of a neat little brochure received from the Green & Hunter Brick Co., which, in a very brief, concise way, tells of the advantages of brick paved streets. The book is intended for free distribution among the engineers and municipal officers of the Lone Star State, and ought to prove an effective, though silent, missionary in the cause of better streets.

Evens & Howard Fire Brick Co., St. Louis, are sending out a very pretty pocket catalogue of their clay products, which includes all sorts of fire brick, boiler tile, chimney tops and flues, sewer pipe, kitchen sinks, laundry tubs, wall coping, etc. All the illustrations are brand new half tones, and are a decided improvement over the old time etchings commonly used for such pamphlets. The cover is a dainty bit of printing. Architects and dealers in clay goods should send for a cópy.

"An Architect's Hand Book on Cements" has been received from Wm. Wirt Clarke & Son, Baltimore, Md. It contains in convenient form specifications and formulae for mixing and using cements as recommended by the leading authorities. It is carefully indexed, and sells in paper covers for $1.00.

"The Clutch that takes hold and lets go just when you want it to and will keep on doing so for years" is the sort of a clutch that clayworkers will appreciate. Those wanting "specifications" are requested to address the Eastern Machinery Co., New Haven, Conn. They will be pleased to furnish full particulars, and can also be induced to explain the merits of the New Haven Brick Machine shown on page 334.

Wants an Up-to-Date Soft Mud Machine.

Editor Clay-Worker:

Inclosed find check for $4.00 for subscription to Clay-Worker until December, 1900. I am in the market for machinery that will make a good brick and work the clay very stiff I am now using a soft mud 30,000 capacity machine, but it does not work the clay stiff enough to suit me.

237 Broom street, Wilmington, Del. JAS. B. OBERLY.

O. R. Hines, of Scio, O., is looking for a desirable location for the establishment of a brick plant. He rather prefers to locate in the Buckeye State.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as Second class matter.

A Practical Illustrated Monthly Magazine, devoted to **Brickmaking** and allied Clayworking Arts and Industries.

SIXTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXXII. OCTOBER, 1899. No. 4

CURRENT COMMENT.

As announced on page 274, the next N. B. M. A. Convention will be held at Detroit, Feb. 5 to 10, 1900. Michigan's chief city is in every way a desirable point. The choice is a good one, and we predict that the Detroit Convention will be one of the largest and most enthusiastic meetings ever held by the National Association.

* * *

At present Oom Paul and his husky followers occupy the center of the world's stage. As all eyes are now turned toward the Dark Continent, we are sure our subscribers will read with more than passing interest the first of a series of articles on the brick and building industry of the Johannesburg district, which forms our leading article this month.

* * *

It may be news to many, but it is a fact, that Africa is a large consumer of American products. Our exports to that country during the fiscal year, 1899, amount to $18,594,424. Treasury reports show that exports from the United States to Africa have grown more rapidly since 1893 than those of any other of the grand divisions of the world. When the cruel war is over, and let us hope 'twill not be long, the demand for American goods and breadstuffs will probably increase, making our trade relations very important.

* * *

This year has proved to those who are making brick in large quantities that their most profitable demand is not from those who use brick by the million, or in large quantities, but rather from those who use brick in moderate quantities. In this and adjacent States there has been a very large demand for brick during the year. However, the orders have come not from the great cities, but from the smaller towns, and even from the farms, where the demand was for moderate quantities, and those which a few years ago might not have been considered by the large manufacturers of brick. A brickmaker said to us not more than two or three days ago that his large demand was from the smaller towns, and that not more than one-third of his product had gone to the larger cities. He said he had found it worth his while not only to consider this trade, but to cultivate it; that they were less exacting in regard to the character and quality of the brick and the time of delivery, and that they paid better prices.

VALUE AND BEAUTY.

It is not many years since many of us thought that art was a thing in itself, but within recent years we have come to know that art, united with clay, or with any other material substance, did much to increase its value. An ugly brick may contain the same amount of material and labor as a beautiful one or a brick with a good form, yet its value is not commensurate with the amount of material and labor involved in its production. However, if we take the artist's idea of beauty and associate it with the same kind of material and labor which would otherwise go into the crude brick, we find we have greatly enhanced the value of the brick This fact is of commercial value. Beautiful brick—those of good form—those of decorative quality—do not cost greatly in excess of the crude form. On the other hand, they sell for much more money. The result is a larger profit to those who have the business sagacity to take up with the higher idea.

PAVING BRICK.

The users of paving brick are coming to take a saner view. Asphalt and wooden block and other pavements have had the call for some years. The poor quality of brick and the poor manner in which it was laid have to some extent, justified this preference for other material for paving. However, the improved character of paving brick and the better manner in which they have been laid within a few years now justify public opinion that the paving brick has become a standard meterial. In this city we have been so fortunate within the last year as to have had a first-class brick pavement and asphalt pavement laid on the same street, the brick having been used in the gutters and for a certain distance in the street. Any one can see at this time that the brick pavement, which has had the hardest wear, is without injury, whereas the asphalt is failing. This is a splendid object lesson and must, within a short time, have its effect in developing a public opinion which will lead to the construction of many brick pavements of a good character. Heretofore brick pavements in this city have been put on streets where a cheap pavement has been wanted. Cheap brick and cheap methods have been used, and consequently the brick have suffered not alone in fact, but in the opinion of the public. Now that we find they can be laid well, and, as mentioned above, a good material has been used, public opinion has changed, and people are now saying, "Why not use this material for the more expensive pavements and lay them in the right way and thus secure a result which has proved so satisfactory in the instance mentioned?"

VITRIFIED SURFACES.

A few days ago a superintendent of one of the great hospitals of this State called on us and said: "Where can I get a fairly good appearing brick with vitrified surface. We are in no position to pay $60 or $70 a thousand for a high grade enamel brick but what we want for our walls is a non-absorbent vitrious surface."

We have talked about this matter before. Brick of this kind can be used for lining stable walls, cellar walls, alley walls that are damp, and for many other purposes. There are many uses for a brick of this kind—a plain, solid, glazed brick is eminently fit for work of this character, and we think a strong demand for this material could be created, at a price yielding a larger profit than is to be expected from the brick ordinarily made. No great technical skill is required in the construction of such brick. However, if the people knew it could be obtained, the market would soon increase, and in the course of time there would be an opportunity for developing a higher grade of manufacture. People do not make fine distinctions in a matter of this kind—they are inclined to say brick are brick. People regard brick, generally speaking, as absorbent. What is wanted is a non-absorbent brick, not necessarily of absolutely uniform color, but one of a high sanitary standard. If people knew they could obtain brick of this kind, they would readily take up the use of it. However, they do not, generally speaking, realize that such a brick is possible.

We have made this suggestion before, but make it again, and we expect by reiteration to in time effect the manufacture of a reasonable number of brick of this kind. We commend this idea to the consideration of those interested in advancing the usefulness and profit of vitrified brick manufacture.

TRADE SCHOOLS.

Looking back a few years in the history of brickmaking, we would not expect coming from the old school of brickmakers a higher technical and scientific knowledge of brickmaking. However, our National Brick Manufacturers' Association was instrumental in forming a school or college, and we have reason to believe that this spirit will, in time, spread over this country, so that many young men who would otherwise become preachers, lawyers and doctors may become scienific brickmakers. Colleges were formerly organized so that the young man from the farm or from the city who went into the college could expect a preparation which would make him either a doctor, lawyer or preacher. Recently this condition has been changed. He may go into a scientific school now and come out a scientific clayworker, a machinist, an engineer, a trained woodworker, a trained man in business, etc. In Germany this thing is carried much farther than here. There a young man may become a scientific weaver—he may learn to make cement, or in fact may learn to do almost anything in a scientific way which his country demands of him. In our land there are many clumsy workmen in many branches of trade. Schools are now being formed so that he may learn to do anything which he has to do in later life. Thus many who would otherwise go into the law or some other profession ill fitted for it may take up the thing they are best qualified for. Young women may study cooking, they may study scientific dressmaking, or anything else they may have a talent for, in the very best way. This is the work of schools, and this is the work that schools are now taking to themselves.

INSURANCE RATES.

It is true that there is not the difference in insurance rates between good methods of construction and poor methods of construction that there should be, but it is also true that there is a difference between that which is inferior and that which is of the best. The Factory Mutuals of New England have studied the question of business construction, and have been able to dictate methods of construction which, during the last few years, have reduced rates from 2 and 3 per cent. to one-third and one-fourth of 1 per cent. through mutual methods, yet it is also true that the stock companies have not made these fine distinctions. In the great cities, people who are constructing buildings according to the best methods are not reaping the benefits which should naturally come to them from good construction. Well constructed buildings are having to carry the cost of insurance on poorly constructed buildings. There are in this city buildings which are not entitled to insurance at any price, which are given the same rates as are demanded from good buildings. On the other hand, there are well constructed buildings, the owners of which are having to pay much higher rates than should naturally be charged on them. The fact is, the owners of these buildings are practically paying insurance on the poorly constructed buildings.

There is a method of insurance prevailing on the continent of Europe which is eminently just, and which greatly differs from the methods which exist here. A man wishing to insure his property takes out three classes of insurance—say he is the occupant of a store building, he takes out first, insurance which relates to his own stock; second, that which relates to any danger which may result to others in the same building in which he is located in the event of fire originating in his property; third, loss to owners of adjacent property and adjacent stock in the buildings on this property. This is eminently fair. We have in mind a building in this city which is well constructed, absolutely fireproof so far as construction is concerned, and yet the rate on it is relatively high. "Why is this?" may be asked. "Oh," they say, "the people next you have a poor risk, in their stock of painters' supplies; if they should burn down they might injure your building." This is unfair. The people who own the painters' stock in the next building, in all justice, ought to pay a rate which would be equivalent to indemnifying those occupying the next building which, in itself, is not calculated either to originate or distribute to its neighbors a dangerous conflagration. In such a case the owners of the high grade property should not be required to carry insurance which, in reality, is a protection against a risk in regard to which they are in no wise responsible.

PRACTICAL PHILANTHROPY.

We have had occasion within the last few weeks to look over old numbers of The Clay-Worker and see what the National Association is really doing. We wish our readers would do this. The National Brick Manufacturers' Association in this country has absolutely revolutionized the methods of brickmaking not alone of their own country, but of the civilized world. The brickmakers of America have come together—they have recounted their experiences—they have published it, and not alone the brickmakers of America have profited by it, but the brickmakers of all nations have studied it, and as a consequence the world has profited by it. The original meetings of the National Association were primitive in character, but the spirit was right, and now it is not alone the practical man, but the scientist, chemist and all high orders of builders who bring to its meetings their experience and knowledge of this kind of work, and it is not the brickmakers alone who will profit by it. The people of the country who use the brick—the capitalist, the builder, the insurers of property—all profit more than the brickmakers themselves. In a measure we may say the work is philanthropic, but like the best of all philanthropic work, it has afforded a reasonable profit, we hope, to those engaged in it. Philanthropy which does not pay is a poor kind of philanthropy—this has been worked out in rental property, building of tenement houses, etc. The people who have built such buildings with the idea of obtaining no profit from them do not confer any good upon the occupants nor upon themselves. But those people who engage in philanthropy with the idea of getting a good thing for the people, and at the same time getting a profit out of it for themselves, have done a good thing for themselves and have received a fair remuneration. Philanthropy which does not pay the investor, as many wise people have come to realize, is a philanthropy which does not pay anyone. Thus it is we are able to say that those who have engaged in technical and scientific brickmaking have been philanthropists, notwithstanding the fact that they have obtained a fair return upon their efforts and upon the capital invested.

THE NAME OF OLD GLORY—1898.

When, why and by whom was our old flag, the Stars and Stripes, first called "Old Glory?"—Daily Query to Press.

Old Glory! say, who,
By the ships and crew,
And the long blended ranks of the Gray and the Blue—
Who gave you, Old Glory, the name that you bear
With such pride everywhere,
As you cast yourself free to the rapturous air,
And leap out full length, as we're wanting you to?—
Who gave you that name, with the ring of the same,
And the honor and fame so becoming to you?
Your stripes, stroked in ripples of white and of red,
With your stars at their glittering best overhead—
By day and by night
Their delightfulest light
Laughing down from their little square heaven of blue!
Who gave you the name, Old Glory—say, who—
Who gave you the name of Old Glory?
The old banner lifted, and faltering, then
In vague lisps and whispers fell silent again.

Old Glory—speak out! We are asking about
How you happened to "favor" a name so to say,
That sounds so familiar, and careless, and gay,
As we cheer it, and shout in our wild breezy way—
We—the crowd, every man of us, calling you that—
We, Tom, Dick and Harry, each swinging his hat
And hurrahing "Old Glory!" like you were our kin,
When—Lord!—we all know we're as common as sin!
And yet it just seems like you humor us all
And waft us your thanks, as we hail you and fall
Into line, with you over us waving us on
Where our glorified, sanctified betters have gone.
And this is the reason we're wanting to know
(And we're wanting it so!
Where our own fathers went we are willing to go.)
Who gave you the name of Old Glory—O-ho!—
Who gave you the name of Old Glory?
The old flag unfurled with a billowy thrill
For an instant; then wistfully sighed and was still.

Old Glory; the story we're wanting to hear
Is what the plain facts of your Christening were—
For your name—just to hear it,
Repeat it, and cheer it, 's a tang to the spirit
As salt as a tear;
And seeing you fly, and the boys marching by,
There's a shout in the throat and a blur in the eye,
And an aching to live for you always—or die,
If, dying, we still keep you waving on high,
And so, by our love
For you, floating above,
And the scars of all wars and the sorrows thereof,
Who gave you the name of Old Glory, and why
Are we thrilled at the name of Old Glory?
Then the banner leaped, like a sail in the blast,
And fluttered an audible answer, at last.

And it spake with a shake of the voice, and it said—
By the driven snow-white and the living blood-red
Of my bars and their heaven of stars overhead—
By the symbol conjoined of them all skyward cast,
As I float from the steeple or flap at the mast,
Or droop o'er the sod where the long grasses nod—
My name is as old as the glory of God.
* * * So I came by the name of Old Glory.
—James Whitcomb Riley, in the Atlantic Monthly.

DEWEY AHEAD OF TIME.

Ah, Misther Dewey, we can see now how yez did it,
An' whilst we knew 'twas in yez an' didn't doubt a minute—
We scarce believed it thrue when th' news came down the line,
That yez slid in on thim Spanyards away ahead of time.

An' now I can't help thinkin' as to how 'twould been wid us
If we had been th' Spanyards an' raisin' all the fuss—
An' lookin' for to meet yez on the twenty-eighth or nine,
An' now to find yez cummin' in two days ahead of time.

'Arrah, Dewey, yer th' man whom we love an' honor now,
An' before yer brand-new title we're not ashamed to bow;
May yer head be always level an' may yer health be fine,
But, say, George! Don't go to heaven two days ahead av time.
—W. M. Fogarty, in Indianapolis Sun.

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FOR SALE — One clay pulverizer; as good as new; very cheap. Address
9 1 1 K., care Clay-Worker.

FOR SALE — 168 iron dryer brick cars; 42,000 ft. one-inch pipe; 2,000 ft. 4-inch pipe; 3 boilers; 2 pumps; one 60 h. p engine; one 30 h. p. engine; 6,000 ft. iron rails, Address
10 1 d F. H. EGGERS, Cleveland, Ohio.

WANTED—A good, sober, industrious man, as superintendent of a one machine soft mud brickyard. Runs all the year round. Steady employment at fair wages to the right man. References required. Address
10 1 d HENRY, care Clay-Worker.

BOOKS FOR BRICKMAKERS.

"CLAY GLAZES AND ENAMELS," **Henry R. Griffen, C. E.**	**$ 5.00**
"BRICKMAKER'S MANUAL," **Morrison and Reep,**	**3.00**
"BRICKMAKING AND BURNING," **J. W. Crary, Sr.,**	**2.50**
"TABLE OF ANALYSES OF CLAYS," **Alfred Crossley,**	**1.00**
"VITRIFIED PAVING BRICK," **H. A. Wheeler, E. M.,**	**1.00**
"PRACTICAL FARM DRAINAGE," **J. J. W. Billingsley,**	**1.00**

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

RAYMOND

BRICK MACHINERY

Where it is Used.

In answer to many inquiries as to where our Machinery can be seen in operation, we submit the above diagram.

RAYMOND BRICK MACHINERY is now used and in daily operation the world over. ❧ Place your finger on the map and you are almost sure to place it upon a Raymond Brick Machine. ❧❧

Our great success has not been obtained without merit. ❧❧ Buy Raymond's and you get the best.

❧

C. W. RAYMOND & CO.
DAYTON, OHIO, U. S. A.

CAPITAL NEWS.

THERE IS ONE INDUSTRY—and quite an important one—in clay, which had its beginning in the District of Columbia, and not very far from the Capital City, and, which, perhaps, is not so well known to the clayworker generally. In fact, the product of this business is used in the larger cities, and even in a large number of these it is unknown.

I am speaking of electric wire underground conduits, which not so many years ago came into use in form of partitioned terra cotta ducts, and demonstrated their superiority over any other kind in use. In Washington their field of usefulness was for a long time quite limited, but the practical utility in preserving wire, saving the cost of poles and having an undisturbed, permanent subway, in no little manner appealed to the electeric companies. Although it is cheaper to use the tops of houses and some poles for stringing wires, the terra cotta conduit gained steadily in favor. And, when Congress passed an act in opposition to the erection of poles in city limits, new impetus was given the conduit industry, and now there are many miles of terra cotta conduits under the city's concrete.

The putting down of these subways seems to be continually going on, for there is hardly a day in the year when some portion of Washington's streets is not being torn up for this purpose. If there were in the middle of all the improved streets a large subway employed for all manner of wires, conduits and ducts running parallel with the sidewalks, much expense and time would be saved to the electric and gas companies and to the city in connection with its water system. And this can be better understood when it is known that there are in the streets of Washington about 3,000,000 feet of duct and over 800,000 feet of conduit.

The production of terra cotta conduits is practically a monopoly, as far as this city is concerned, being carried on by one manufactory, the Potomac Terra Cotta Company, located three miles from the city. This company owns the patent for electric conduits, and was the first to manufacture these, having filled its first contract on order from the U. S. Electric Lighting Company, of Washington, about ten years ago. The contract was not a large one, and the income from conduit making was, at that time, but small. The business now amounts to between $60,000 and $80,000 a year.

This company also manufactures sewer pipe in large quantities, filling orders in various parts of the country. The plant covers several acres of ground, and near by are extensive deposits of red clay, in excavating which between twenty and thirty acres have already been worked. Your correspondent recently made a visit to the terra cotta company's works in pursuit of information, and was much interested in the manner of making up its wares. On approaching the factory I was also struck with a peculiar feature of one of its buildings. This was built of neither brick nor wood, but was composed entirely of four-way conduits, each about ten inches square and two feet long, laid in mortar, as in regular brick-wall work. Here was not only manifest economy—as the conduits thus used were not marketable—but a thick, well-ventilated and always dry wall was obtained. I cannot say that the effect produced by using conduits this way is artistic, but it is unique, and, in this case, very cheap.

Upon going inside the factory my attention was attracted to a workman who was rapidly molding curved sections of closet pipe, turning out one about every twenty minutes. His usual task is twenty-five a day. From a pile of excellent red clay this expert molder, in making his ware, would cut a lump, roll it into a mass about four inches thick, which was put upon a board and bent so as to conform, in a measure, to the curves of the mold. The roll now was flattened to the thickness of an inch, and in this shape put upon and bent into all the inner parts of the mold. This, of course, is in two parts, made of plaster of paris, which, when both are filled, are brought together, after which the workman fills and smooths, with his hand and a piece of chamois skin, the joints. The mold and its contents are now laid aside for four or five days, and then taken to the kiln for burning and salt-glazing. The factory has twelve kilns, principally of the circular body and round-top kind, with an average diameter of twenty-eight feet. This gives a great deal of floor space to each kiln, and such is required in the manufacture of large pipe, which, in the present case, extend to a thirty-inch diameter, and range downward to three inches.

An evidence of good business times with the Potomac Terra Cotta Company is in the fact that new machinery for making conduits for electric wires is now being put in at the factory, and no doubt an increased output will soon follow.

It may be of interest to say something about the method of making these important adjuncts to the light and power outfits of electric companies and to convenience and safety in a city's streets. To begin with, the clay used for this purpose, after being brought from the beds from the near-by hills (which are practically inexhaustible), is dumped into hoppers at the building, falling thence into the grinding mill, an open receptacle ten feet long, having a revolving horizontal shaft, on which are radial knives. By the latter the lumps of clay are reduced to small particles, which are discharged at one end of the trough, falling upon a belt conveyor, by which the partly ground material is taken up to a grinding mill situated on another floor. From this it passes through crushing rollers, coming out as powder, to be conveyed by a second belt and attachments to the basement, where it is spread over the floor.

After being wet, left in piles for five days and sufficiently tempered, the clay goes through the pug mill and is then taken to the top of the building and thence to the forcing presses. Here the plastic mass is driven through the press and around the dies, under 120 pounds pressure, and comes out in one-way, two-way or four-way ducts, according to the dies employed. The latter are about twelve inches in length, and carry small rods for making cavities in the ends of the ducts for the reception of dowel pins, and also for forming a small central duct in the conduit.

The power plant of the factory consists of three boilers aggregating 225 horse power, and an Atlas engine, the latter being employed principally for the grinding machines. Steam from the boilers is also used for drying the green ware, for which process the two upper floors of the building are used. Here the damp conduits—the largest of which, when finished, weighs eighty pounds—are brought and left for from four to six days, and, after being sufficiently dry, are taken to the kilns, fixed, fired, and, at the proper time, salted, that they may come forth hard and shining, ready to resist water, electricity and the tooth of Time in any way he may wish to gnaw.

NICODEMUS.

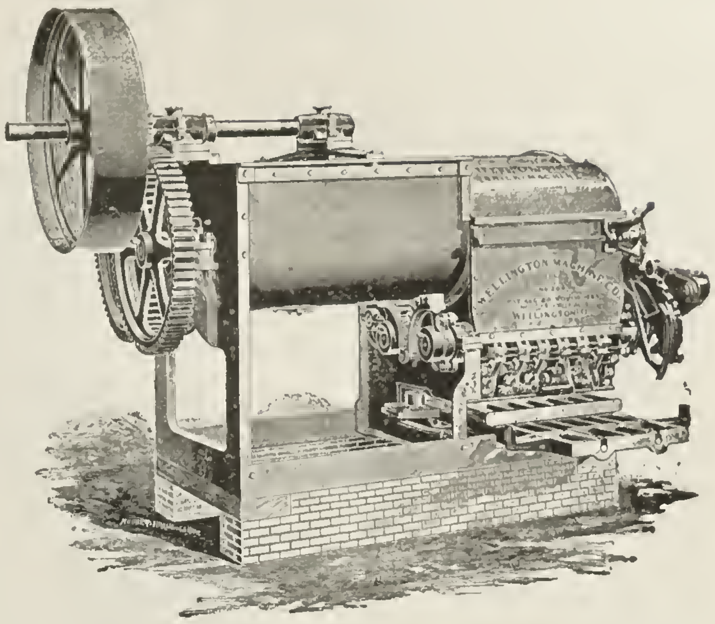
HOLDING THE BOARDER.

SALLY FARMER—"If that summer boarder proposes to me to-night what shall I tell him?"

MRS. FARMER—"Put him off for a week. I think he's got money enough left to pay for another week's board."

THE WALLEDOFF GASTORIA VILLA
GOOD BOATING
GOOD FISHING
GOOD SWIMING
NO MUSQUITOES
FINE TABLE
SPLENDID SCENERY
FRESH EGGS AND MILK AND OTHER GOOD THINGS TOO NUMEROUS TO MENTION ON THIS BOARD
TERMS
4$ 63¢ PER WEEK.
FLOHRI
Judge

SPECIAL.



FOR SALE:

A Cheap Brick Machine.

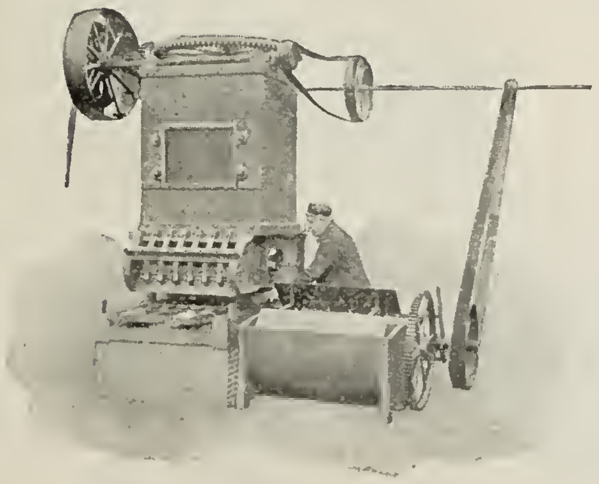
DEAR READER:—

We have been selling machines 20 years, and it has been pounded into us, year after year, that the trade wants the **cheapest** machine, and the trade is right. A brick machine isn't bought for a years use, but for many. Like when selecting a wife it pays to look ahead five, ten and 20 years and consider how she will wear and what she will cost after the first expenses of getting possession. Many a brickmaker has bought a "pretty good" machine at an "attractive figure," like many a young fellow who marries a "pretty good" girl with an "attractive figure" and in a short time finds them so expensive to keep up, that he rues the day he overlooked getting **brains and reliability** when selecting. Can't buy brains? You bet you can. They are incorporated in a machine, in so constructing it, that it will not only make a perfect brick, but stand up to the work, year after year. "Attractive figures" is a time-worn bait. Wise men don't bite. **Reliability** is really the most important point to consider.

> MORTON, PA., July 4th, 1899.
>
> THE WELLINGTON MACHINE CO.— * * * I have used the "**Monarch" Machine** three years and never had a breakage, nor lost an hour on account of the machine.
>
> Yours truly, H. I. ACKERMAN.

This one is only a sample. In our circular are **many more** stating the same thing. The **dear** machines (which sell at a cheap **first** cost) cannot show such. They give fine "first year" testimonials, but none with the flavor of age. We give a large proportion **after** machine has been used several years. "To get your money's worth," you **must** buy for the **future.**

Remember, that we cannot tell it all here, but that we give you a few pointers to get you started right towards getting the **cheapest** machine in the market. It is cheapest because it does perfect work, and counting three years, five years, ten years or more, it will cost you much less than any other. No other has 14 feet of pug mill. No other has double presses. No other has a press but what wears. We have sold to the most conservative and careful buyers who investigated its record, principles and construction. Just get our circular and see what they say, and also study the "points" in this machine. There are many important ones contained in no other machine. Coal costs money. **Under like conditions** the **"Monarch"** takes one-third to one-half less power. Figure that saving for next ten years.



For yards of ordinary capacity our "IRON QUAKER" has lead for years. Both Horse and Steam power.

A Full Line of Supplies, and Auxilliary Machines.

BALL-BEARING Barrows and Trucks.

Send for Circular.

The Wellington Machine Co.,

WELLINGTON, OHIO.

PACIFIC COAST NEWS.

IT IS A HARD THING to explain why the brick and clayworking business remains so quiet. One of the leading members of this business, in conversation with your representative, said that the California and Pacific coast outlook for the clayworkers is certainly very good, and, if the rains will begin soon and fall in sufficient volume, it will have a very strengthening effect on trade, because the farmers will feel more like spending money and throwing it into channels which lead into the hands of everybody. Nearly all the members of the trade are busy on small work, which keeps all hands busy, more or less, and serves to relieve the monotony of an otherwise inactive season. There is quite a dearth in the construction field just now—that is, as far as large work and buildings is concerned here in San Francisco, and that work that is going on is confined, in most instances, to minor jobs.

Gladding, McBean & Co. are working on the architectural terra cotta and hollow tile fireproofing for the United States Custom House which is being erected at Portland, Ore. The building is about two hundred feet square and four stories high, and it will be several months before it is completed. This contract calls for about $75,000 worth of work from this local firm.

The Steiger Terra Cotta and Pottery Works are doing a good deal in the way of sewer contracts at present. They have an exhibit at the Mechanics' Fair, in this city, which attracts a great deal of attention. There is a modeler and an old-fashioned potter's wheel running. The modeler presents the ladies with little flower pots and fancy ware, and a large crowd of interested spectators is always to be found around this attractive exhibit.

C. Y. Burr, the expert brick and stone mason, of Sumpter, Ore., is now burning one brick kiln containing 250,000 brick, and is preparing another kiln of the same capacity, which will be burned as soon as the present one is finished. Mr. Burr burned one kiln in August, and will burn another very soon, making, in all, about one million brick.

The largest and most valuable deposit of kaolin on the continent is situated on El Cajon mountain, about twenty miles east of San Diego, Cal. The principal owner of the claim is Charles String, an experienced miner. He was prospecting for gold on the barren sides of El Cajon mountain, some months ago, when he came upon what appeared to be a vast deposit of valuable pottery clay. Mr. String filed upon seven locations, taking in about all the kaolin there was in sight on the surface. Since that time other locations have been made by other persons. Mr. String sent samples of the clay to Japan and to manufacturers in the Eastern States. The samples sent to Japan aroused the greatest interest among the porcelain manufacturers of that country, and Mr. String some time ago received an inquiry as to how much of the clay he could furnish on board the California and Oriental steamers at San Diego, and at what price per ton. The kaolin was the best that had been seen in Japan, and was badly wanted. An American firm has investigated the deposits, and is now endeavoring to purchase the property.

A large deposit of the best pipe clay has been found in Chino valley, fourteen miles west of Del Rio Station, A. T., on the Santa Fe, Prescott & Phoenix Railway. The deposit appears almost inexhaustible. The clay is hard and takes a good polish.

Stevens & Collins, of Kendrick, Ida., contemplate moving their brickmaking plant to Palouse, Wash., this fall, where, with new machinery, they intend to manufacture white brick.

The pottery at Lincoln, Cal., is very busy, getting out rush orders. Fourteen cars, containing sewer pipe, brick and terra cotta, have just been sent to Honolulu. The company is erecting an additional warehouse, 50x90 feet and two stories high.

The Nelson Brick Manufacturing Company, of Nelson, B. C., is now delivering brick at the Burns Block from a kiln of 200,000, that are of a uniformly excellent quality. The company has 150,000 more molded for a kiln of 300,000 that will be burned this fall. It expects to sell between 900,000 and 1,000,000 brick this year.

Reports from Yukon are to the effect that 250,000 brick will be burned this year in the yard six miles up the Yukon. These brick are of a very good quality, and are being used extensively in the building of chimneys and fire boxes. They retail for about $100 per thousand.

The brickyards at Missoula, Mont., closed their works last month for the season. The late season has interfered a great deal with the brickyards, and the number of brick manufactured this year will not reach the average that was attained in former years. The late rains have also interfered with the making of brick.

The Spokane Brick and Lime Company, recently organized at Spokane, Wash., under the management of L. E. McGee, reports business as prosperous. The company has constructed a new draw kiln and made other improvements to its plant at Squaw Bay, and is now turning out a large quantity of material.

The Puget Sound Brick, Tile and Terra Cotta Company's works were burned Sept. 14, the machinery being destroyed, and the loss is estimated at about $6,000.

Miss Josephine Foard, of New York, has been staying in Laguna, N. M., for several months, for the purpose of interesting the Indians in a process of glazing their native pottery. The Santa Fe & Pacific Railroad has recently granted her a plat of land, and she will now erect a kiln of the most complete pattern for more thoroughly burning their pottery. This work is to be perfectly free of cost to the Indians, and the kiln, when completed, will be given to them free of charge.

Brigham Leighton and J. W. Robinson have started a brickyard about six miles east of Redding, Cal. They claim to have ten acres of excellent clay. The first kiln of 150,000 brick will be burned soon.

The following statistics are taken from data compiled by the California Mining Bureau relative to the pottery clay interests of the State, which show the quantity and value of the product for twelve years, from 1887 to 1898, inclusive: In 1887 75,000 tons were produced, valued at $37,500; in 1888, 75,000 tons, valued at $37,500; in 1889, 75,000 tons, valued at $37,500; in 1890, 100,000 tons, valued at $50,000; in 1891, 100,000 tons, valued at $50,000; in 1892, 100,000 tons, valued at $50,000; in 1893, 24,856 tons, valued at $67,284; in 1894, 28,475 tons, valued at $35,073; in 1895, 37,660 tons, valued at $39,685; in 1896, 41,907 tons, valued at $62,900; in 1897, 24,592 tons, valued at $30,290; in 1898, 28,947 tons, valued at $33,747. The total for twelve years amounts to 711,437 tons, valued at $531,479.

SAN FRANCISCO, Oct. 9, 1899. SUNSET.

VAN DUZEN'S STEAM JET PUMPS.

It is impossible to describe all the uses to which their steam jet pumps are adopted. They are sold all over the wide world, and are pumping over thirty different kinds of liquids. They will not pump heavy oils or greases. They make first-class fire pumps, being absolutely reliable and certain to start work as soon as steam is turned on.

For full particulars send for catalogue No. 68, the E. W. Van Duzen Co., Cincinnati, O.

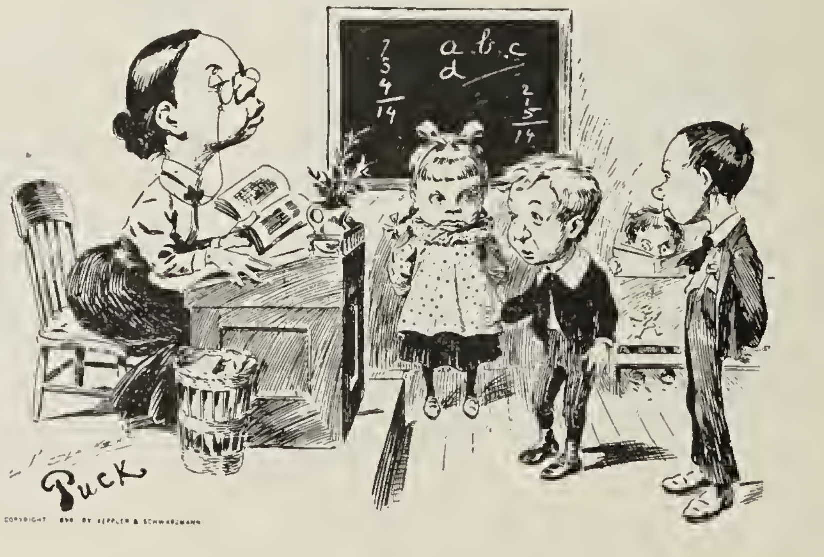
The Rock Island playing cards are the slickest you ever handled. One pack will be sent by mail on receipt of 15 cents in stamps. A money order or draft for 50 cents or same in stamps will secure four packs, and they will be sent by express, charges prepaid. Address

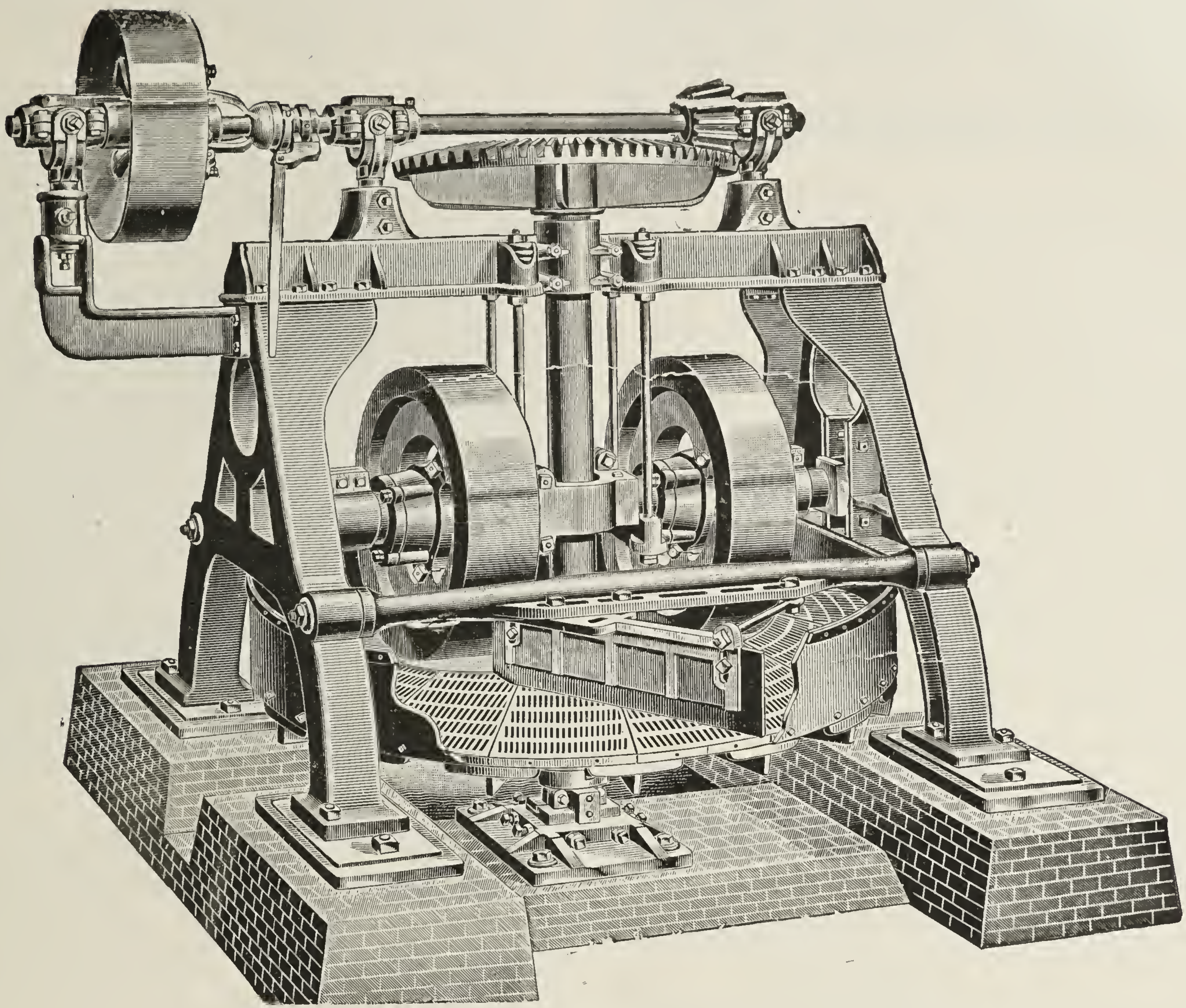
JOHN SEBASTIAN, G. P. A., C., R. I. & P., Chicago.

GETTING OUT OF IT.

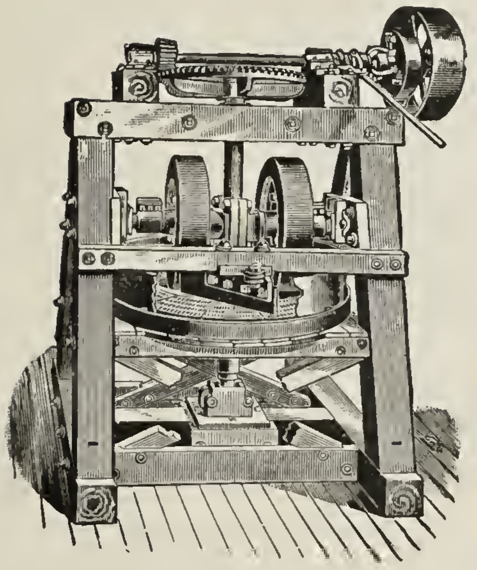
TEACHER—How is the United States of America bounded?

SCHOLAR (who don't know)- Why—er—since de war, Ma'am, there is no north, no south, no east and no west, ter dis glorious country!



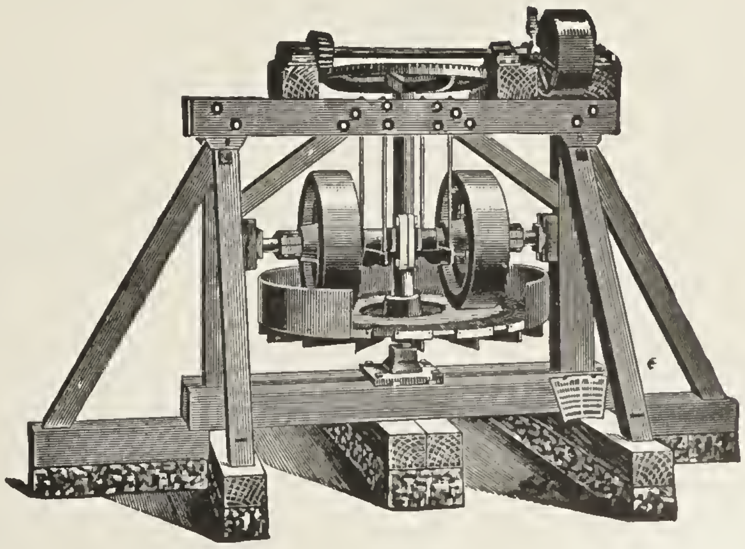


OUR SPECIALTY IS **DRY PANS.**



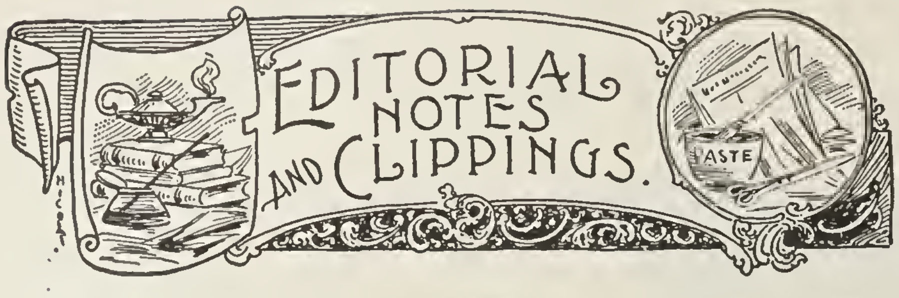
IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



......SEND FOR NEW ILLUSTRATED CATALOGUE......

FROST ENGINE CO., Galesburg, Ill., U. S. A.



EDITORIAL NOTES AND CLIPPINGS.

Miller & Kelly will establish a new brick plant at Laurel Hill, Fla.

The Keystone Brick Co., Whitney, Fla., are in the market for a pug mill.

Benjamin Craycroft, Vandalia, Ill., wants to purchase a second-hand dry pan.

Otis and Wilson Warren, of Statesboro, Ga., will establish a brick plant at Leonard, Ga.

The Burns & Russell Co. has been incorporated to manufacture brick at Baltimore Md.

A. H. Parker sustained a $1,000 loss by fire at his brick plant, at Laurel, Miss., recently.

Ernest Chambers will engage in the manufacture of tile at Hinckley, Ill., in the near future.

Harman & Judik, Arlington, Md., are in the market for a second-hand Martin brick machine.

A pottery will, in all probability, be started at Maynard, S. C., by B. A. Green and L. T. Wimpey.

C. M. Glover is at the head of a movement to establish a vitrified brick plant at Newton, Kan.

James F. Dovey will enlarge his brick plant at Blairsville, Pa., to a capacity of 25,000 brick daily.

J. R. Van Buren & Co. have organized a company to develop large clay deposits at that place.

The Dickinson Run Co. is the name of a new concern at Dawson, Pa., organized to manufacture brick.

E. W. Smith, of Houston, Tex., is interested in a new brick plant to be established at Meadowbrook, Texas.

Alexander & King are making preparations to manufacture brick at Oxford, Ala., at the old Humphries yard.

Stevens & Collins will move their brick plant to Palouse, Idaho, from Kendrick, enlarging and improving it.

Dennis Williams, a contractor and builder, will operate the Levin brickyard at Alexandria, La., making brick for his own use.

The brick plant of Carleton & Pascal, of Camden, Me., which was recently destroyed by fire, will be rebuilt on a much larger scale.

The Puget Sound Brick, Tile and Terra Cotta Co., Seattle, Wash., sustained a loss of $7,000 by fire, which started in the dryer.

J. H. Duke has established a brick plant at Anniston, Ala. He expects to equip the plant with new machinery in the spring.

The Poreclain Faced Brick Co. is the title of a new firm incorporated at Trenton, N. J., recently. The authorized capital is $6,000,000.

Damage to the extent of $500 was caused by fire at the Sands Brick Co.'s plant, at Cambridge, Mass. The flames originated in the dryer.

The Harbison & Walker Co. will erect a new brick plant at West Homestead, Pa., where they will manufacture hollow building tile for foundations.

B. Brewer, 1401 Arapahoe street, Denver, Co., writes that he is in the market for a second-hand four-mold Boyd brick press, for which he will pay cash.

Mr. C. N. Adams has sold the works of the Adams Brick Co., at Alexandria, La., to Hoffman & Wilson, who will operate this plant in addition to one they are now running. Mr. Adams expects to purchase land in the gas region of Kansas, where he will establish a large plant about the first of the coming year.

The Bell County Brick Co. expect to make extensive changes in their plant at Belton, Texas., this winter, equipping the works with new up-to-date machinery.

J. F. Embry, of Anniston, Ala., is having some clay tested. If the tests prove satisfactory, as it is now anticipated they will, Mr. Embry will at once build a plant.

Morrisville, Vt., wants a brickyard. A good practical man desiring to locate in that vicinity can obtain particulars by addressing the editor of the Morrisville News.

D. Williams has purchased the interest of John Davis in the pottery at Manchester, Ill. The pottery will be operated in the future by Mr. Williams and Newton Davis.

The trade of the Conway (S. C.) Brick and Tile Co. has increased to such an extent that they will have to add new machinery to enable them to meet the demand.

E. L. Reese, T. F. and P. J. Lyons have purchased the brickyard of John Hyland, at Marshfield, Wis., and will enlarge the same, adding an entire equipment of new machinery.

A company has been organized by J. J. Favre, W. Rudolph and A. Dugne for the manufacture of brick at Pearlington, Miss. The proposed plant will have a capacity of 50,000 daily.

George Hislop, 334 Dearborn street, Chicago, Ill., writes that he is interested in a large deposit of kaolin in the South, and will be glad to correspond with the manufacturers of machinery, etc.

Considerable damage was done in Dunn & Doan's brickyard, at Glencove, N. Y., recently, by the unusually high tide breaking through the clay bank which separates the brickyard from the bay.

J. Rook has started a new brickyard a North Greenfield, near Milwaukee, Wis., where he has sixty acres of good clay. Mr. Rook states his yard is not included in the so-called combine of the Milwaukee plants.

George Snelson, an employe at the brick plant of David Urquhart, at Moscow, Idaho, was caught beneath a bank of falling clay and almost instantly killed. He was thirty-one years old and unmarried.

Frank McDonald, Montgomery, Ala., writes that he expects to manufacture brick in a small way at that place, and would like to correspond with brick machinery manufacturers. His address is 121 South street.

Patrick Kelly & Son, corner of Ninth street and Lehigh avenue, Philadelphia Pa., advise us they are in the market for a second-hand drying apparatus for drying soft mud brick; also second-hand dryer cars.

The Sterling Brick Co. has been incorporated at Marietta, O. They will manufacture both building and paving brick. F. L. Alexander, F. P. Morse, C. W. Sugen and D. R. Rood are interested. The capital stock is fixed at $30,000.

C. Cappel writes that he will establish a modern brick plant at Pittsburg, Pa., on Soho street. He says the plant will be modern in every respect. He will manufacture by the stiff mud process and expects to turn out 40,000 brick per day.

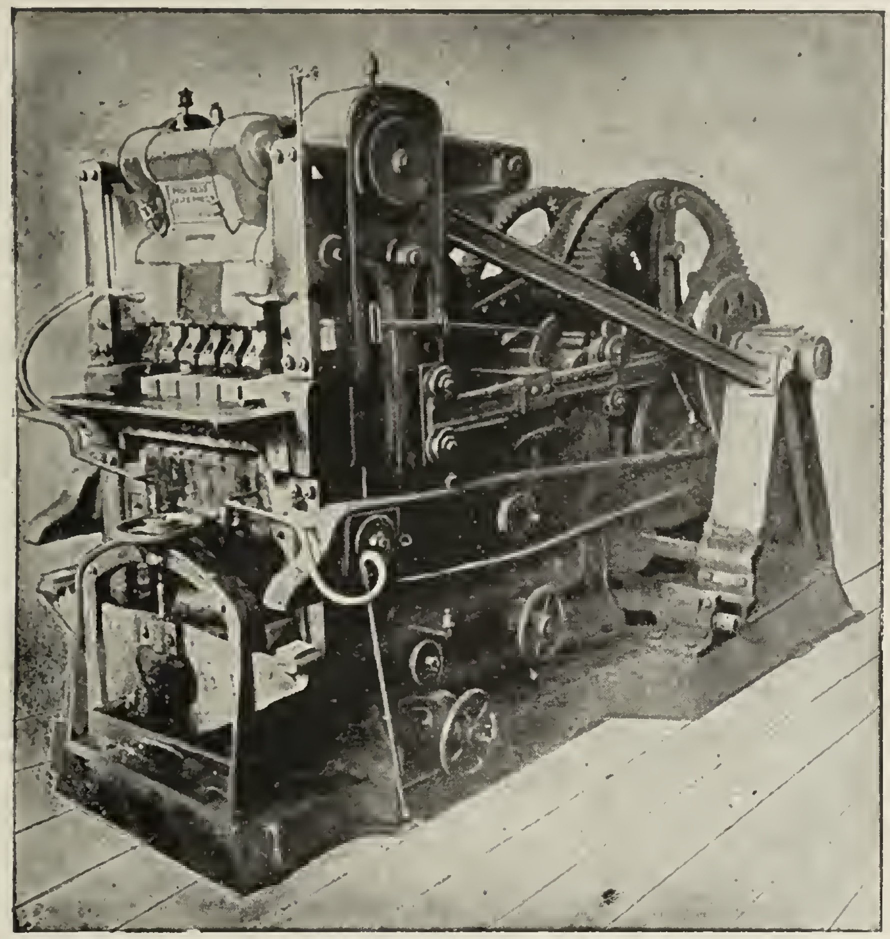
The Hoosier Brick Co., of New Albany, Ind., have booked an order for 5,000,000 brick for the Reformatory at Jeffersonville. This, in addition to the other orders on hand, will keep the works running day and night for eighteen months.

J. H. Legg & Son are erecting a brick plant at Calhoun, Ga. The new yard will have a capacity of 50,000 daily, and will be operated instead of their own plant on the opposite side of the river. They will make paving brick as well as common building brick.

At the annual directors' meeting of the American Clayworking Machinery Co., at Bucyrus, O., the following officers were elected for the ensuing year: R. C. Penfield, president

CONTINUED ON PAGE 308.

The Progress Brick Press.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

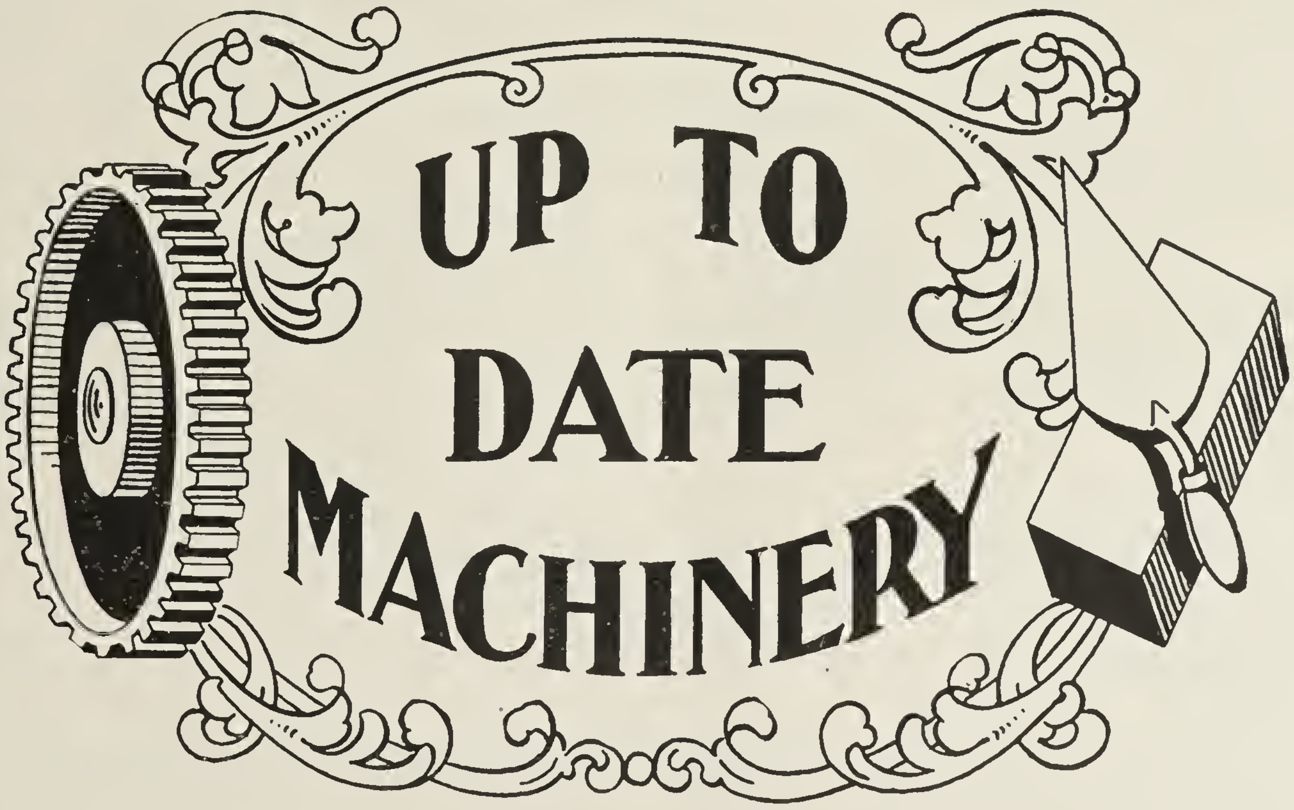
Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE ON APPLICATION. . . . .

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R. *ST. LOUIS, MO.*



When Buying New Machinery

Why not get it strictly **UP-TO-DATE?** Machines go out of date soon enough anyway, without buying a back number to start with. All the latest conveniences and improved appliances for making Sand Moulded Brick, Wire Cut Brick, Paving Brick, Drain Tile, Fire Brick and Pressed Front and Ornamental Brick, can only be found on our machines. Chicago is a strictly Up-to-Date town, and we are right in the middle of it.

CHICAGO BRICK MACHINERY CO., 225 Dearborn Street.

EDITORIAL NOTES AND CLIPPINGS—Continued.

and general manager, New York; C. W. Fisher, vice president, Bucyrus, O.; L. W. Penfield, second vice president and resident manager, Willoughby, O.; J. B. Gormly, treasurer, Bucyrus, O.; W. W. Reehl, secretary and assistant general manager, Bucyrus, O.

The buildings and machinery of the Rankin Brick Co., Bloomington, Ill., burned to the ground the 8th inst. The plant had been idle for several years, and was owned by the Continental Packing Co., of Bloomington. The loss is estimated at $20,000.

Purinton & Co., Waterville, Me., are burning a kiln of 1,050,000 brick. This, it is claimed, is the largest kiln of brick ever burned in the State of Maine. In common with the other brickmakers of Maine, Purinton & Co. have had a very busy season.

Burman & Heistand, manufacturers of flower pots, at Donnellsville, O., contemplate moving their plant to Springfield, O., in which event the plant will be largely increased, as the move will give them better shipping facilities, and so enable them to cater to the trade in surrounding towns.

Our good friend, Anthony Ittner, of St. Louis, Mo., has recently booked some good orders. Among them is one for 500,000 brick for the National Enameling and Stamping Co., Granite City, Ill.; 250,000 brick for Miller Bros., Pittsburg, and 250,000 to the Southern Illinois Construction Co.

The brick plant of George J. Fickes, at Steubenville, O., was badly damaged by fire recently. The flames originated in one of the tunnels in the dryer. The loss is estimated at $1,500, and it would have been several times that amount had is not been for the timely assistance rendered by the employes.

The powder magazine of the Harbison & Walker Fire Clay Works, ten miles north of Altoona, Pa., and in which 350 kegs of powder and a case of dynamite were stored, was blown to atoms by an explosion recently. The cause of the explosion is unknown. Fortunately no one was near the building at the time.

Articles of incorporation of the Eldora (Ia.) Pipe and Tile Co. were filed recently by C. A. and H. A. Rawson and C. A. Reaves, all of Des Moines. The new company has purchased the plant of Mr. G. McGregor, and will improve and enlarge it and run the works to its fullest capacity. They have $35,000 capital stock.

Chambers Bros. Co., brick machinery manufacturers, of Philadelphia, Pa., find a very gratifying increase in their trade throughout the Southern States, where their machines appear to be constantly growing in favor. They report recent orders from Maryland, South Carolina, Alabama, Tennessee and Mississippi.

W. H. Ward, of Thurber, Texas, has purchased the Newman-Carroll brick works at El Paso, Texas. He will increase the capacity of the plant, adding presses for the purpose of making dry press brick. Mr. Ward is also considering the advisability of buying the plant of the El Paso Press Brick Co., with a view of consolidating the two industries.

J. I. and W. L. Jones and Robert Dyas, who now operate a brick plant at Huntsville, Ala., have purchased fifteen acres of land north of that town, on which they will erect a large steam brick plant, which will be equipped with modern machinery and appliances. The new plant will in no way interfere with the old works, which will be operated as usual.

Mr. George Paul, a Clay-Worker subscriber at Chihauhau, Mexico, in a recent letter tells of a large opera house now in the course of construction at that place. Over three million brick will be used, all of which, with the exception of the front brick, will be made at Chihauhau. The front brick will be brought from Guadalajara, a distance of 800 miles. This will be quite a handsome building, and is being erected by Governor Miquel Alamada. George E. King, of Guadalajara, is the architect, and George Paul superintendent of construction. The first story is of stone, but the three remaining stories will be of brick, with cut stone trimmings. The building, of which Mr. Paul is quite proud, will cost $400,000.

J. E. Stockwell, who for many years has manufactured brick at Lincoln, Neb., has removed to Tacoma, Wash., where he will establish a large brick plant early in the coming year. Mr. Stockwell finds the clay in Tacoma of a superior quality, and there is no doubt but that with his experience he will make a success of his new venture. The Clay-Worker joins with his many friends in wishing him all sorts of good luck.

The entire plant of the Celadon Terra Cotta Company, at Alfred, N. Y., was burned to the ground on the morning of the 4th inst. This was one of the largest roofing tile plants in the United States, and the loss is estimated at $200,000, one-half of which is covered by insurance. The plant will probably be rebuilt as soon as possible. Mr. Charles T. Harris, well known to most members of the N. B. M. A., is president of the company, but at the time of the fire was in New York city.

The Evens & Howard Fire Brick Co., St. Louis, Mo., have recently closed a contract for two hundred cars of sewer pipe for Jackson, Miss., and have commenced shipment. They have also completed one hundred ovens for the Mexican Gulf Coal and Transportation Co., of Howe, Indian Territory. They are also doing a good terra cotta business, at present executing a contract for the Illinois University. In fact they are enjoying a splendid trade in all branches of their industry.

In a recent letter renewing his subscription to The Clay-Worker, J. L. Purple, secretary of the Columbia (Pa.) Brick Co. says: "Prosperity struck us this season as well as our Western brother brickmakers, as we have had a very busy season, with a prospect of running late in the winter. We put in a steam dryer last spring, and lucky for us that we did, as it increased our capacity, and will enable us to run as long as the demand continues. Heretofore we had to close down as soon as frost came no matter what the demand."

A fire broke out in the plant of T. B. McAvoy Sons, at Front street and Nicetown lane, Philadelphia, and for a short duration made things look serious, owing to a lack of water, the hydrant being a block from the plant. With well-directed efforts, however, the firemen succeeded in confining the flames to the sheds, and in thirty minutes after their arrival had effectually stamped out the destroying enemy. The loss is estimated at $1,000. The origin of the fire was believed to be due to the breaking of a bridge pole in one of the kilns. Fortunately, none of the machinery was touched.

THE ROCK ISLAND WALL MAP OF THE UNITED STATES Is the best offered to the public. It is very large and specially adapted to school purposes. Every teacher of geography and every business office should have one. It will be sent post paid to any address on receipt of 15 cents in postage stamps or coin. Address
JOHN SEBASTIAN, G. P. A., Chicago, Ill.

VAN DUZEN'S STEAM JET PUMPS.

This pump has no moving parts, and is operated independently of any engine or motive power. Has no mechanical arrangement to absorb power, requires no oil, packing or special care, and is therefore absolutely reliable; is certain to start as soon as steam is turned on, and will continue to work as long as steam and water are supplied. This pump is light in weight, small, portable and quickly removed from place to place. It requires no skill to set it up or take it down.

Send for catalogue No. 68 to E. W. Van Duzen Co., Cincinnati, O.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

STEEL COUNTRY ROADS.

The steel country roads, with which the United States department of agriculture is experimenting, will practically be constructed as follows: The present design calls for an inverted trough-shaped steel rail, with a slightly raised head on the inside, and an eight-inch tread and 7-16-inch thick. These rails would be bedded in gravel laid in well-drained trenches, and the rails would be tied together at the ends and at the middle. On grades the rails would be indented slightly to prevent the horses slipping on the rails; the joints would be made stronger than the rail to prevent "low joints," and to prevent the formation of ruts alongside the rails each joint would form a remount" for the wheels. The advantage claimed for these steel roads is the reduction in traction from 40 pounds per ton on macadam to eight pounds on the steel rails. The materials for the heavier class of steel roads of this design will cost about $3,500 per mile in small quantities. The amount of material required is less than 100 tons per mile, and long lines could probably be built for $2,000 per mile. The lighter type of road only requires 50 tons per mile, and would cost about $1,000 per mile. These prices are exclusive of grading and track-laying.

WANTED — By young man of experience and ability, position as assistant secretary or bookkeeper in large concern, or would assume management of an exchange embracing from ten to fifteen yards. Address
WIDE AWAKE,
10 1 d Care Clay-Worker.

WANTED—An interest in a brick plant. An experienced manufacturer who quit the brick business during the dull season, wishes to re-engage in the business. Will take the general management of a plant and purchase same or an interest in it, if conditions justify. Will not invest until satisfied on the latter point. Address,
READY MONEY,
9 tf d care Clay-Worker.

WANTED — Situation as superintendent or manager of building or paving brick plant. Have been engaged in the business for many years, understand every detail thoroughly and know how to manage men successfully. No bad habits. References as to efficiency and reliability. Address.
PERMANENT,
10 1 q care Clay-Worker.

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

CALDWELL HELICOID CONVEYOR.

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

H. W. CALDWELL & SON CO., 127-133 West Wash. St., CHICAGO, ILL.

Our new Catalogue No. 25 (380 pages), will be sent upon application.

The Peerless System Up-Draft, Down-Draft and Continuous Kilns

Is the Acme of Perfection in Brick Burning.

READ WHAT THEY SAY ABOUT IT:

LaPrairie Pressed Brick and Terra Cotta Co., Quebec:

"We have been using two of these rebuilt Kilns for the last two years, and the fact that we are now reconstructing another, demonstrates our Entire Satisfaction with your PEERLESS SYSTEM.

Elmsdale Brick Co., N. S.:

"Never saw a Kiln work so even and free both in watersmoking and burning in all my life. The arches were as good as any other part of the Kiln."

John Cubbins Sons, Memphis, Tenn.:

"After burning the first kiln that was changed, the second time, we found the improvement so great and so much Superior to the old updraft kilns, that we are now changing our entire system to your PEERLESS PATENT."

Jacob Kline, Baltimore, Md.:

"Your system of burning good hard brick is without doubt the best I have ever seen."

And there are Others.

No matter what you manufacture, or the capacity of your plant, if your make is of clay and you want it burned, write us for information. If you have kilns that are not giving satisfaction, or from any other cause you cannot burn your ware, write and tell us all you know about the trouble.

J. W. CARSON, Construction Engineer of Brick Works. Montezuma, Ind.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED — Position as burner and brickmaker, by an experienced party; can give good references. Address
HIGH,
10 1 c Care Clay-Worker.

WANTED — A second-hand No. 3 Raymond hand repress.
DIERKING & SCHMIDT,
10 1 c Secor, Ill.

FOR SALE — Clay crusher; in fair condition, and will be sold cheap. Address
NEW PROCESS,
10 1 d Care Clay-Worker.

FOR SALE — Second-hand steel tee rails. 800 feet 12 pounds to yard and 1000 feet eight pounds to yard.
D. C. SPRAKER,
Kokomo, Ind.

FOR SALE — One "Freese" differential smooth roll clay crusher; good condition.
ENGLISH MINING & MFG. CO.,
10 tf d Jackson, Mo.

WANTED — A good second-hand flower pot machine; must be in good condition and cheap.
FLOWER POT,
10 1 c Care Clay-Worker.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address
F. B.
10 tf d care Clay-Worker.

FOR SALE — Brick and tile works, in good condition; large capacity; plenty of market; would consider other property for part pay; now in operation. Address
D. W. TOWNSEND,
9 6 d Cherokee, Ia.

FOR SALE — Yard rights of the Swift stack, coal coking table, furnace, kiln, together with guarantee and protection; send for price list and catalogue.
F. E. SWIFT,
9 tf d Washington, Ia., U. S. A.

POSITION WANTED — Enameler is open to take charge of first-class plant. Satisfactory proof of ability given firms of good standing and ability only.
J. HIGGINSON,
8 3 p Grant Ave., Trenton, N. J.

SITUATION WANTED—By expert continuous kiln fireman who can design and erect improved Hoffmann kilns of any desired capacity. Information and estimates cheerfully furnished. Address
H. OFFMANN,
9 1 2 pm care Clay-Worker.

WANTED—Situation as manager of the glaze or enamel department of brick and terra cotta plant Understand the technical side of the business thoroughly, and can give best of references. Addcess
VITREOUS,
10 1 q care Clay-Worker.

WANTED — Permament position as superintendent of brick works; years of experience; thoroughly reliable and competent; best of reference. Address
A. GOODMAN,
10 1 d Care Clay-Worker.

THE EXPERIENCED potter can find best clay land at $30 per acre, wood $1 per cord, near Seattle; 80,000 population, with practically a monopoly of the business.
R. H. BALLINGER,
910 University St., Seattle, Wash.
10 1 p

IRON DRYER CARS WANTED—The undersigned desire to purchase from 75 to 100 iron dryer cars, second handed, but they must be in good order. Address, with description of cars and price,
ADAMS BROS.-PAYNE CO.,
9 2 d Lynchburg, Va.

FOR SALE — White clay mine of 20 acres, Saylorsburg, Monroe county, Pennsylvania, including outbuildings, etc., now in operation; quarter of a mile from railroad track; clay suitable for tiling and fancy brick; sold on account of other business; offer wanted. Address, for particulars,
RUSTEN & ROBBINS,
10 1 r 24 Court St., Brooklyn, N. Y.

FOR SALE CHEAP.

Two 4-Mold Simpson Dry Presses, Cost $3,500 each. Only used three months. Plant having been changed to Paving Brick. Just as good as new. Will sell for $1,500 each F. O. B. cars, Cleveland, Ohio. Inquire of

FRANK B. MANY,
809 Cuyahoga Bldg. Cleveland, Ohio.

LIST OF SECOND-HAND BRICK MACHINERY FOR SALE.

One Henry Martin horse-power brick machine; in good order. This machine has been run some five or six short seasons, and will make a good machine for parties that wish to invest but very little to run a small yard.

One Standard wood frame horse-power brick machine; good as new; only made about 50,000 brick.

One Standard wood frame steam power machine, which was changed from horse to steam power, and has only been used to make about 100,000 brick, and is practically as good as new.

One extra heavy wood frame steam power Quaker machine, Haverstraw style, with an eight-foot pug mill, shaft and pulleys all complete; in good running order; has been used some four or five seasons on a summer yard; has been under cover and had first-class care; has a complete set of extras with it.

One Monarch brick machine, in good running order; has been used four or five short seasons on a summer yard.

One Anderson steam power brick machine; 12-foot pug mill and pulleys all complete; in good running order; in fact, this machine is nearly new.

Four Old Reliable hand brick machines; good as new.

One Wellington mold sander; very little used.

One Pott's mold sander; in first-class condition.

One E. M. Freese No. 4 board delivery cutter for side-cut brick on a stiff mud machine. This cutter is practically as good as new. The party of whom we bought it was obliged to change to soft mud, and it has never been used to cut over 50,000 brick.

One Brewer crusher complete; in first-class order; been used two seasons on a summer yard.

One new Brewer crusher; has never had a shovelful of clay through it, latest 1899 pattern.

One Carnell No. 2 hand brick press; this press has been used but very little; to press about 25,000 to 50,000 brick.

One 8-foot Penfield horizontal pug mill; in good order.

One O. Barber standard sewer pipe press, with dies running from 3 to 24 inches, inclusive; also trucks, drums, etc.

One extra heavy Quaker wood frame steam power machine; in first-class condition.

One No. 3 Penfield corrugated roll crusher, complete, with feeder; in good order.

One Penfield No. 7 stiff mud brick and tile machine; has full set of tile dies up to 12 inches. This machine has been but very little used.

HORTON MFG. CO.,
Painesville, O.

....WHAT THE CLAY WORKER NEEDS....

Is a belt that will accomplish the heavy work required of it,

holding the bucket firmly without slipping.--This the

Leviathan Belting

does better than any other, and, what is of more interest to Clay Workers, the LEVIATHAN will

WORK FOR YEARS IN A DUST CLOUD,

or exposed to weather conditions of any kind.

THESE ARE THE REASONS WHY LEVIATHAN BELTING IS IN SUCH GENERAL USE AMONG CLAY WORKERS.

MAIN BELTING COMPANY,
1221-41 Carpenter St., Philadelphia, Pa.
1221-41 Market St., CHICAGO. Send for Price List and Samples. 120 Pearl St., BOSTON.

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices before purchasing.

IF YOU NEED.. Wooden Pallets

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also Decks for Dry Cars.

We can ship them anywhere.

Get good Pallets from those who know how to make them. It will pay you in the long run. . . . . . .
Send for circulars and prices.

W. B. MERSHON & CO.,
Saginaw. East Side Mich.

Mention the CLAY-WORKER,
When writing to Advertisers
Mention the CLAY-WORKER.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt. Marietta, Pa. } **Chenoa, Ill.**

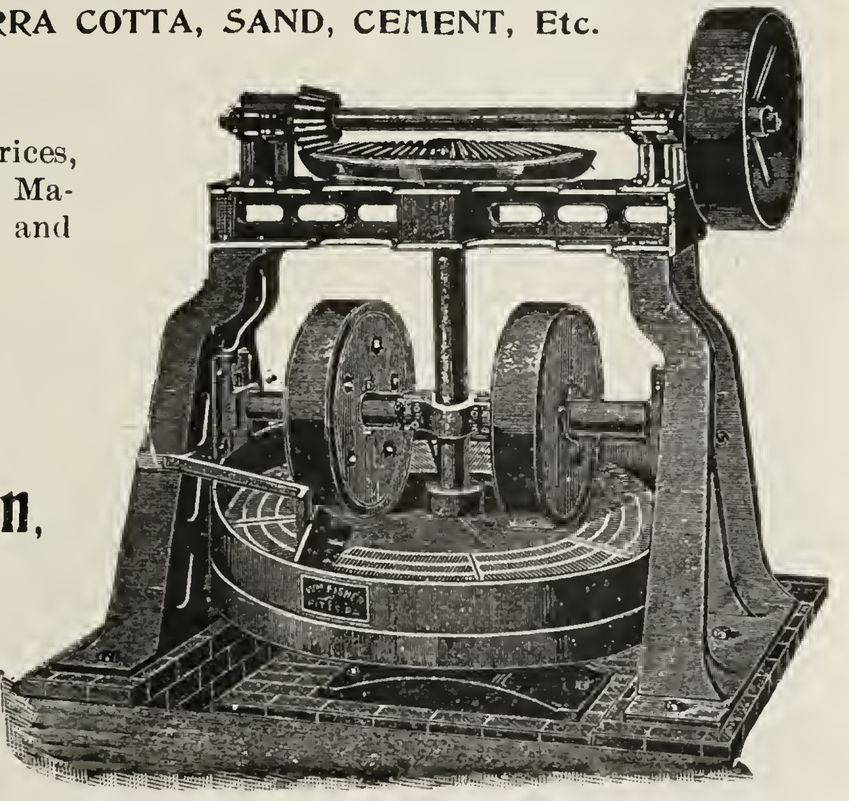
The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS, Agent and Patentee, **161 Grand Street, Rahway, N. J.**

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.



When writing for Prices, state kind of Clay or Material to be ground and capacity required.

Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works,

24th and Smallman Sts.,
PITTSBURG, PA.

Mention the CLAY-WORKER,
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER.

FOR SALE — One of the best paying brick and tile factories in Iowa.
12 tf d Lock Box 36, Lohrville, Ia.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.

T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Wellsburg, W. Va.

FOR SALE—GREAT BARGAIN—Henry Martin "A" Brick Machine, capacity 30,000, very good order; pug mill, crusher, elevator, shafting, etc, $750. All in first-class working order.
1 tf dm BOX 13, care Clay-Worker.

FOR SALE—Four-mold Boyd Dry pressed brick machine, quite new, at half cost. Capacity 25,000 to 30,000 per day. Also one 4-mold Eureka dry pressed brick machine, good order; great bargain. One straight line engine, 14x14 cylinder; excellent order; very low. One No. 2 Worrell Dryer. One 48-inch Ross Disintegrator.

C. SIEDLER, Pres.
9 tf d 156 Fifth Ave., New York, N. Y.

FOR SALE —Brick plant on trunk line railroad near Chicago, having an established trade of 18 years; land contains ample supply of excellent fire clay; also shale and clay suitable for best quality paving and common brick, drain tile, etc.; factory running regularly, and equipped with modern machinery and appliances; can be bought outright or leased for a term of years on reasonable terms; reason for selling other business; a snap for the right parties looking for good location. Address

OLD BRICKMAKER,
6 tf d Care Clay-Worker.

FOR SALE—ENTIRE OUTFIT.

Of a modern brickmaking plant consisting of boilers, engines, dry pan, pug mill, automatic cutting table and repress, trucks, tracks and lot of one-inch pipe for drying oven; having a capacity of 20,000 brick per day. Plant has not been in use over three months and was installed by Frey-Scheckler Co., of Bucyrus, O. Can be seen on premises three-fourths of a mile from Robesonia, Pa., on line of Lebanon Valley R. R. and reached by trolley line and a five minutes walk. For further particulars apply to

J. H. MALTZBERGER,
9 3 c Reading, Penn.

MUST CHANGE HANDS.

A controlling interest in the Rich Hill Vitrified Brick and Tile Co. for sale or trade. Paid up capital stock, $17,540. Plant has 20 acres of land, on which is a 4 to 10 foot vein of shale, of which their brick are made. Directly under the shale is 3 to 4½ feet of fine coal, used for steam and burning. The plant has a 1,100 horse power engine and two large boilers; all in good working order; has been running this season; capacity, 20,000; the brick are moved on cars from machine to 50,000 capacity dryhouse, then to kilns; when burned can be loaded on cars on switch 20 feet from kilns; switch has connection with three railroads, and is 4 feet lower than bottom of kilns. Cause of change, death and outside business. For particulars address RICH HILL VITRIFIED BRICK & TILE CO., Rich Hill, Mo. 9 3 c

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FOR SALE.

Brickyard consisting of the following: Fifteen acres of clay land, one Brewer machine, one Little Wonder machine, two patent kilns, with elevator, one dryer and rolling shed, three sheds 25 by 100 feet, five rows of racks with pallets, two patent trucks, wagon, wheelbarrows, picks, etc. blacksmith shop with tools, one locomotive, one forty horse power engine, one dwelling house of eight rooms and shanties for workmen. This yard is located in the South, and in a perfectly healthy locality. No overflow, and can burn with wood or coal. Get all labor needed cheap. Commissary building. Profits of commissary will pay all labor. If party wants to make money here is a chance for a practical brickmaker. Ready market for all brick made. For further particulars write

C. H. BEALE,
415 Madison Ave., Montgomery, Ala.
9 3 lm

COLORIFIC.

For coloring Brick, Mortar and all clay products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Samples free. Ask for price of

WESTBROOK & WELLS, Ogdensburg, N. Y.

FOR SALE CHEAP.

A Good Dry Press Brick Machine, in good running order, will be sold for less than half first cost. Its all right and a bargain. Have changed to Stiff Clay Process. Address

"SECOND HAND,"
1 tf d. care Clay-Worker.

VanDuzen's STEAM JET Pumps.

Lowest priced reliable Steam-jet pumps in the World. 10 sizes, ranging from $7 to $75. Fully guaranteed. Especially serviceable in **Tile and Clay Works, Brick yards, Quarries, Mines,** etc., for elevating or forcing water. Sandy or muddy water can't injure it. Simple, Portable, Durable and cheaper than ordinary steam pumps. Write for Catalogue No. 68.

The E. W. VANDUZEN CO., Cincinnati, Ohio.

Anglo-American Pottery.

Old English China with American Views.

A Manual for Collectors, by

Dr. Edwin AtLee Barber, A. M., Ph. D.

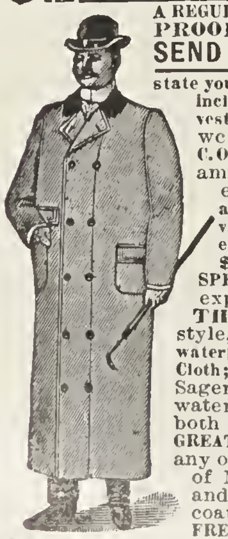
Author of THE POTTERY AND PORCELAIN OF THE UNITED STATES, Etc.

The book consists of about 170 pages, illustrated with 93 half-tone engravings of old plates and pitchers bearing American designs, produced by English potters between 1815 and 1840, and sketches of each English Potter. Over 500 different designs, in dark blue and other antique china are listed. The work will prove of great interest to all lovers of old crockery in America and England and will be especially valuable to collectors.

The price is $1 60 per copy, postage prepaid.

T. A. Randall & Co.,
The Clay-Worker,
INDIANAPOLIS, IND.

$2.75 BOX RAIN COAT



A REGULAR $5.00 WATER-PROOF MACKINTOSH for $2.75

SEND NO MONEY. Cut this ad. out and send to us, state your height and weight, state number of inches around body at breast, taken over vest under coat, close up under arms, and we will send you this coat by express, C.O.D., subject to examination. Examine and try it on at your nearest express office, and if found exactly as represented and the most wonderful value you ever saw or heard of, and equal to any coat you can buy for $5.00, pay the express agent OUR SPECIAL OFFER PRICE, $2.75, and express charges.

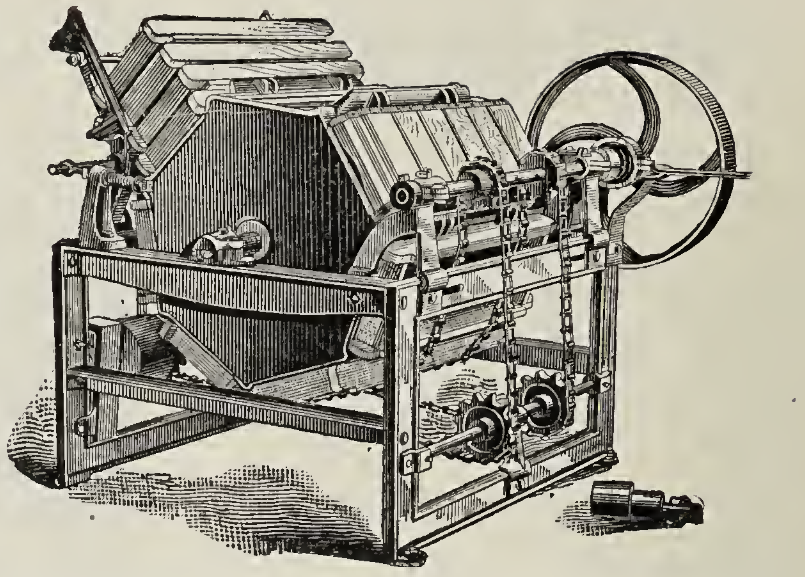
THIS MACKINTOSH is latest 1900 style, easy fitting, made from heavy waterproof, tan color, genuine Davis Covert Cloth; full length, double breasted, Sager velvet collar, fancy plaid lining, waterproof sewed seams. Suitable for both Rain or Overcoat, and guaranteed GREATEST VALUE ever offered by us or any other house. For Free Cloth Samples of Men's Mackintoshes up to $5.00, and Made-to-Measure Suits and Overcoats at from $5 00 to $10.00, write for FREE SAMPLE BOOK No. 90E. Address,

SEARS, ROEBUCK & Co. (Inc.) CHICAGO.
(Sears, Roebuck & Co. are thoroughly reliable.—Editor.)

CHAMPION Brick Mould SANDING MACHINES.

No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds. My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.

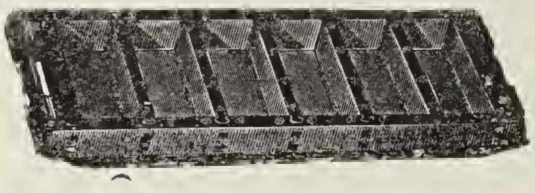


We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

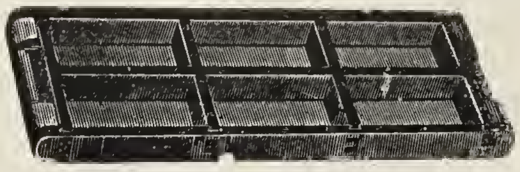
The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been succesful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

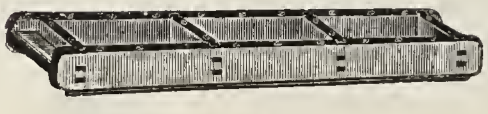
1899--BRICKYARD SUPPLIES--1899



6 Brick Machine Mold.



6 Brick Hand Mold



3 Brick Hand Mold.

NOW Is a good time to look over your stock and see what you will need for the coming season.

Send your orders to "Arnold's" for what you need. You can send the order now and we will have them ready to ship at the time you want them.

You will be sure to get the best there is made and if you want anything special in the line of Moulds, Trucks or Barrows of different designs you can get it made to order here at reasonable prices.

Moulds, Trucks and Barrows a Specialty.

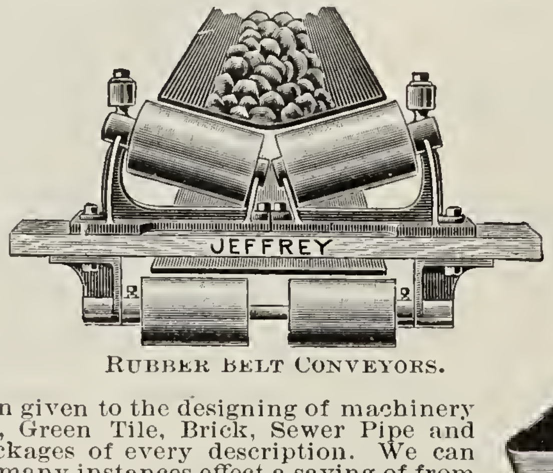
D. J. C. ARNOLD, New London, Ohio.

The JEFFREY MANUFACTURING CO., Columbus, Ohio.

Elevating, Conveying and Power-Transmission Machinery,

For Handling Material of all Kinds.

Spiral Conveyors,
Clay Elevators,
Cable Conveyors,
Elevator Buckets,
Elevator Bolts,
Rubber Belting,
Cotton Belting,
Leather Belting,
Etc., etc.



RUBBER BELT CONVEYORS.

Link Belting,
Chains, (all styles).
Sprocket Wheels,
Shafting,
Pulleys,
Hangers,
Gearing,
Elevator Boots,
Etc., etc.

Special attention given to the designing of machinery for Handling Clay, Green Tile, Brick, Sewer Pipe and packages of every description. We can in many instances effect a saving of from 10 to 50% over present methods used.

SEND FOR 1899 CATALOGUE AND PRICES.

St. Louis Terra Cotta Co.,

....MANUFACTURERS OF....

Architectural and Ornamental Terra Cotta.

Works and Office, 5801 Manchester Ave.,
ST. LOUIS, MO.

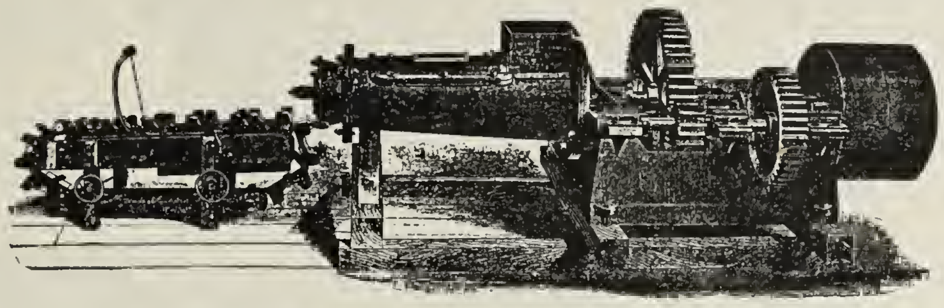
In Stock: Diaper Tile of all sizes, Caps, Coping, String and Belt Courses, Panels, Skewbacks, Etc.

ESTIMATES FURNISHED ON APPLICATION.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers ... of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

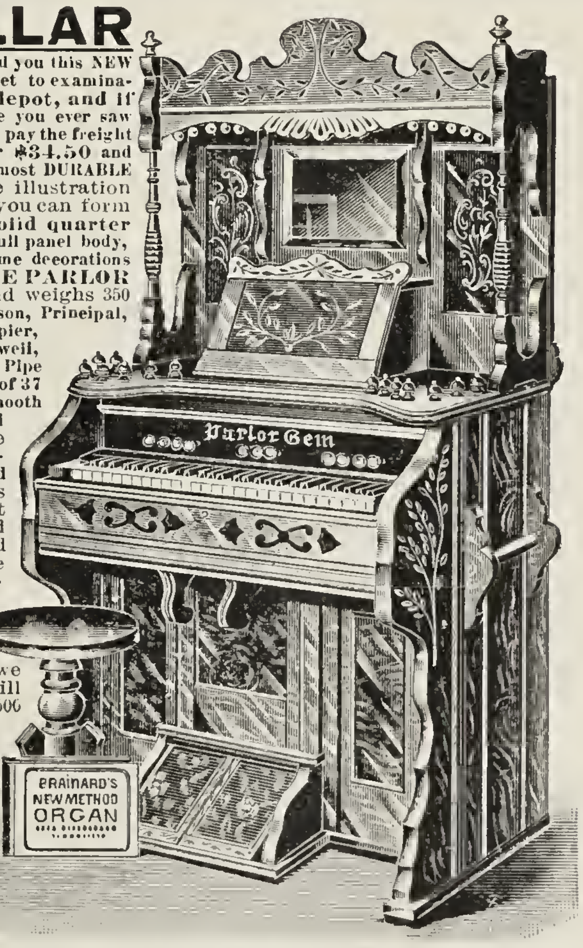
Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

SEND US ONE DOLLAR

Cut this ad. out and send to us with $1.00, and we will send you this NEW IMPROVED PARLOR GEM ORGAN, by freight C. O. D., subject to examination. You can examine it at your nearest freight depot, and if you find it exactly as represented, the greatest value you ever saw and far better than organs advertised by others at more money, pay the freight agent **OUR PRICE $35.50,** less the $1.00 deposit, or $34.50 and freight charges. **THE PARLOR GEM** is one of the most DURABLE AND SWEETEST TONED instruments ever made. From the illustration shown, which is engraved direct from a photograph you can form some idea of its beautiful appearance. **Made from solid quarter sawed oak or walnut as desired,** perforated key slip, full panel body, beautiful marquetry design panels and many other handsome decorations and ornaments, making it the VERY LATEST STYLE. **THE PARLOR GEM** is 6 feet high, 42 inches long, 23 inches wide and weighs 350 pounds. Contains 5 octaves, 11 stops, as follows: Diapason, Principal, Dulciana, Melodia, Celeste, Cremona, Bass Coupler, Treble Coupler, Diapason Forte and Vox Humana; 2 Octave Couplers, 1 Tone Swell, 1 Grand Organ Swell, 4 Sets of Orchestral Toned Resonatory Pipe Quality Reeds, 1 Set of 37 Pure Sweet Melodia Reeds, 1 Set of 37 Charmingly Brilliant Celeste Reeds, 1 Set of 24 Rich Mellow Smooth Diapason Reeds, 1 Set of Pleasing Soft Melodious Principal Reeds. **THE PARLOR GEM** action consists of the Celebrated Newell Reeds, which are only used in the highest grade instruments; fitted with Hammond Couplers and Vox Humana, also best Dolge felts, leathers, etc., bellows of the best rubber cloth, 3-ply bellows stock and finest leather in valves. **THE PARLOR GEM** is furnished with a 10x14 beveled plate French mirror, nickel plated pedal frames, and every modern improvement. We furnish free a handsome organ stool and the best organ instruction book published.



GUARANTEED 25 YEARS. With every PARLOR GEM ORGAN we issue a written binding 25-year guarantee, by the terms and conditions of which if any part gives out we repair it free of charge. Try it one month and we will refund your money if you are not perfectly satisfied. 500 of these organs will be sold at **$35.50. ORDER AT ONCE. DON'T DELAY.**

OUR RELIABILITY IS ESTABLISHED If you have not dealt with us ask your neighbor about us, write the publisher of this paper or Metropolitan National Bank, or Corn Nat. Bank, of Chicago; or German Exchange Bank, New York; or any railroad or express company in Chicago. We have a capital of over $700,000.00, occupy entire one of the largest business blocks in Chicago, and employ nearly 2,000 people in our own building. WE SELL ORGANS AT $22.00 and up; PIANOS, $115.00 and up; also everything in musical instruments at lowest wholesale prices. Write for free special organ, piano and musical instrument catalogue. Address, (Sears, Roebuck & Co. are thoroughly reliable.—Editor.)

SEARS, ROEBUCK & CO. (Inc.), Fulton, Desplaines and Wayman Sts., **CHICAGO, ILL.**

W. R. Osborne,

Metuchen,
N. J.

Water Wells,
Tanks,
Pumps,
Etc.

LOW
PRICES

A Chance for A Choice.

WE SELL

The New Century Caligraph,
The New No. 4 Yost,
The Ball Bearing Densmore,

Typewriters.

Illustrated Catalogues sent on application.

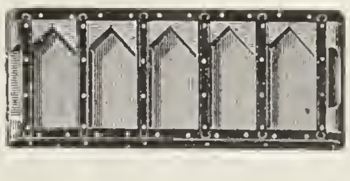
UNITED TYPEWRITER AND
SUPPLY COMPANY,
Circle and East Market Street,
INDIANAPOLIS, IND.

The Henry Martin Brick Machine Mfg. Co.,

Lancaster, Pa.

Machine Brick Moulds

a Specialty.



PRICES:

Steel bound machine moulds, 5 or 6 brick	$1.75 each
With Steel Lined Heads, 5 or 6 brick	$2.00 each

With Panel Bottoms, solid, 5 cents per brick extra.

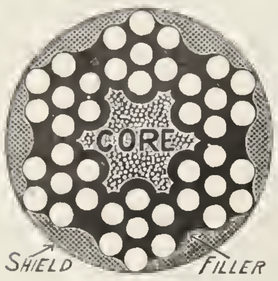
With name plates 5 cents per brick extra.

Top irons dovetailed, or crimped if preferred. Handles any desired pattern.

SEND US A SAMPLE ORDER.

Why Not Preserve

YOUR



Wire Ropes,
Manila Ropes,
...Gearing?

Catalogue P tells how.

The IRONSIDES CO.,
Columbus, Ohio, U. S. A.

GABRIEL & SCHALL

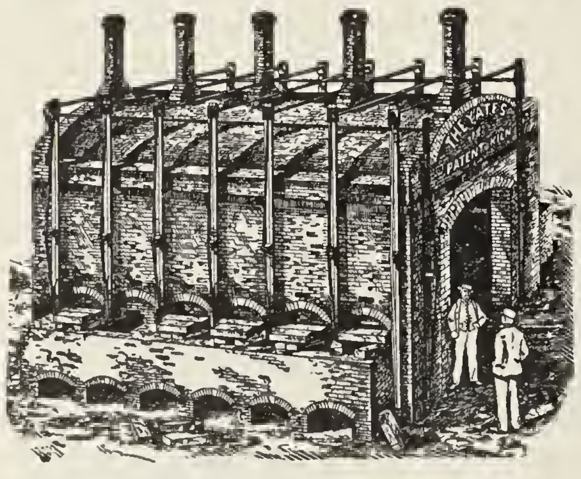
P. O. Box 2654. 205 Pearl Street.
NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. **Carbonate of Barytes**

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.



For Economy of Fuel and Percentage of Hard Burned Brick,

This kiln has no equal. Constructed to burn without smoke and give an even distribution of heat, producing uniform burns.
Hot air dryer. Continuous and Muffle Kiln.

ALFRED YATES,
JOHNSONBURG, PENN

SIMPLICITY

THE DOTS IN OUR HALFTONES

HAVE A SHARP PRINTING QUALITY.
SEND FOR '98 CATALOG
INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.

COX'S

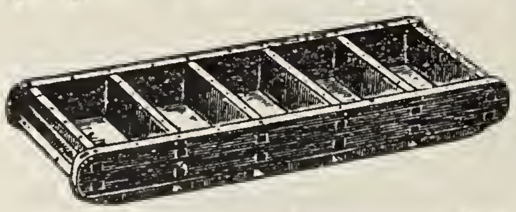
Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

G. COLDEWE & CO.,



MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE MOULDS

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

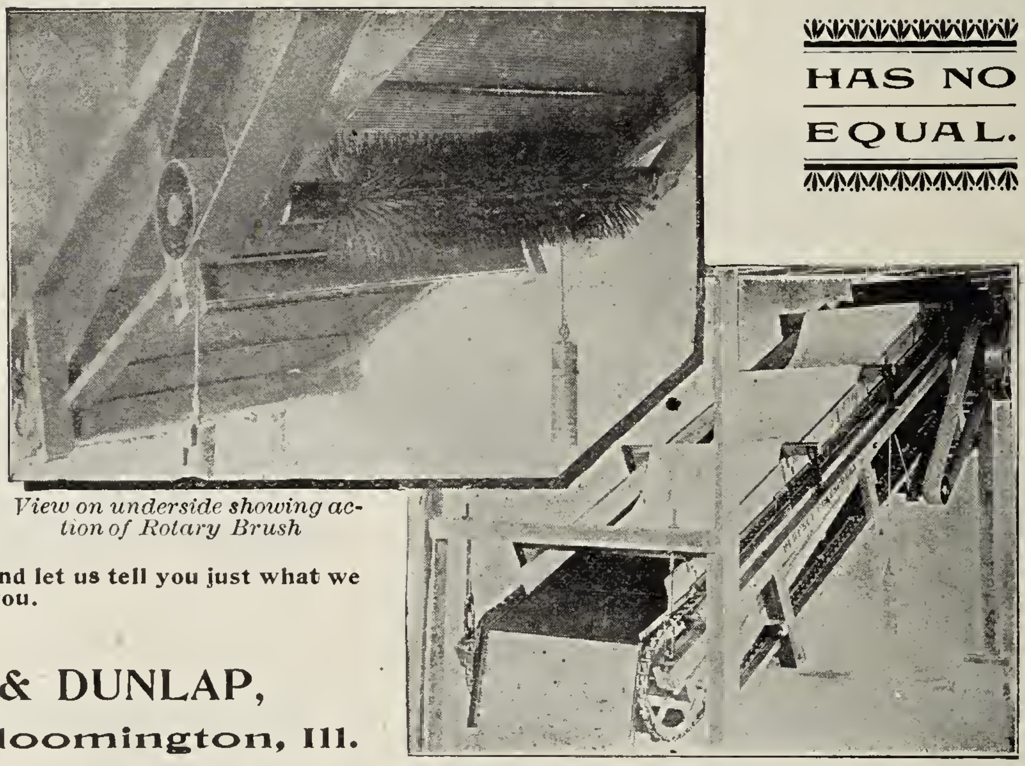
A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

The PERFECT CLAY SCREEN.

HAS NO EQUAL.

- This Screen positively Saves one man.
- Increases grinding capacity.
- Gives a finer grade of clay
- Does the work as well in cold weather as in warm.
- Screens cold moist clay as well as dry.
- It will more than save its cost in one Winter.



View on underside showing action of Rotary Brush

Drop us a line and let us tell you just what we can do for you.

ELDER & DUNLAP,
Bloomington, Ill.

SEND NO MONEY WITH YOUR ORDER, cut this ad. out and send to us. and we will send you OUR HIGH GRADE DROP CABINET BURDICK SEWING MACHINE by freight, C. O. D. subject to examination. You can examine it at your nearest freight depot and if found perfectly satisfactory, exactly as represented, equal to machines others sell as high as $60.00, and THE GREATEST BARGAIN YOU EVER HEARD OF, pay your freight agent our **Special Offer Price $15.50** and freight charges. Machine weighs 120 pounds and the freight will average 75 cents for each 500 miles. **GIVE IT THREE MONTHS' TRIAL** in your own home, and we will return your $15.50 any day you are not satisfied. We sell different makes and grades of Sewing Machines at $8.50, $10.00, $11.00, $12.00 and up, all fully described in our Free Sewing Machine Catalogue, but $15.50 for this DROP DESK CABINET BURDICK is the greatest value ever offered by any house.

This illustration shows the machine open, ready for use.

BEWARE OF IMITATIONS by unknown concerns who copy our advertisements, offering unknown machines under various names, with various inducements. Write some friend in Chicago and learn who are reliable and who are not.

THE BURDICK has every MODERN IMPROVEMENT, EVERY GOOD POINT OF EVERY HIGH GRADE MACHINE MADE, WITH THE DEFECTS OF NONE. Made by the best makers in America, from the best material money can buy.

This shows the machine closed to be used as a center table, stand or desk.

SOLID QUARTER SAWED OAK DROP DESK CABINET, piano polished. One illustration shows machine closed (head dropping from sight) to be used as a center table, stand or desk, the other open with full length table and head in place for sewing, 4 fancy drawers, latest 1899 skeleton frame, carved, paneled, embossed and decorated cabinet finish, finest nickel drawer pulls, rests on four casters, adjustable treadle, genuine Smyth iron stand. Finest large High Arm head, positive four motion feed, self threading vibrating shuttle, automatic bobbin winder, adjustable bearings, patent tension liberator, improved loose wheel, adjustable pressure foot, improved shuttle carrier, patent needle bar, patent dress guard, head is handsomely decorated and ornamented and beautifully nickel trimmed. **GUARANTEED** the lightest running, most durable and nearest noiseless machine made. Every known attachment is furnished and our Free Instruction Book tells just how anyone can run it and do either plain or any kind of fancy work. A 20-Years' Binding Guarantee is sent with every machine.

IT COSTS YOU NOTHING to see and examine this machine, compare it with those your storekeeper sells at $40.00 to $60.00, and then if convinced that you are saving $25.00 to $40.00, pay your freight agent the $15.50. WE TO RETURN YOUR $15.50 if at any time within three months you say you are not satisfied. ORDER TO-DAY. DON'T DELAY. (Sears, Roebuck & Co. are thoroughly reliable.—Editor.)

Address, **SEARS, ROEBUCK & CO. (Inc.) Chicago, Ill.**

FIRE **BRICK**

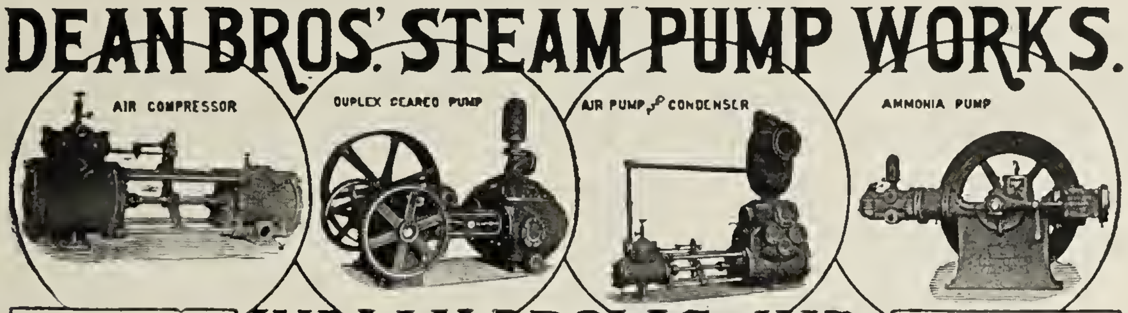
Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio.

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va.,

Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

DEAN BROS.' STEAM PUMP WORKS.



PUMPING MACHINERY FOR ALL PURPOSES

INDIANAPOLIS, IND.

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Do You Want

CREDIT REPORTS on men who make BRICK, on men who buy BRICK, on men who sell BRICK? Trustworthy service at lowest prices; ordinarily $1.00 for each report.
RELIABLE LIST of BRICK manufacturers and Supply men, in any State, in any Country? These can be furnished at small cost, usually $1.00 for any single list.
ADVANCE REPORTS that are advance reports of all contemplated construction work calling for BRICK?
TO KNOW how to sell BRICK to the Government? Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, **ASSOCIATED TRADE & INDUSTRIAL PRESS,**

ESTABLISHED NINE YEARS. Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.

We carry a stock of goods valued at $1,500,000.00

We receive from 10,000 to 25,000 letters every day

We own and occupy the tallest mercantile building in the world. We have over 2,000,000 customers. Sixteen hundred clerks are constantly engaged filling out-of-town orders

OUR GENERAL CATALOGUE is the book of the people—it quotes Wholesale Prices to Everybody, has over 1,000 pages 16 000 illustrations, and 60,000 descriptions of articles with prices. It costs 72 cents to print and mail each copy. We want you to have one. SEND FIFTEEN CENTS to show your good faith. and we'll send you a copy FREE, with all charges prepaid.

MONTGOMERY WARD & CO. Michigan Ave. and Madison Street CHICAGO

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write
J. ST. KOSLOWSKY,
or Industrial Agt., St. Louis, Mo.
E. W. LABEAUME,
G. P. and T. A., St. Louis, Mo.

Indiana, Decatur & Western

RAILWAY.

Short line between **INDIANAPOLIS** and **KANSAS CITY.** **The only line running Reclining Chair and Sleeping Cars between CINCINNATI, INDIANAPOLIS, DECATUR and SPRINGFIELD, ILL.**

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express	8.15 a m
Accommodation	3.45 p m
Fast Express	11.10 p m
Chicago Fast Line	11.50 a m

ARRIVE.

Fast Express	3.35 a m
Accommodation	10.40 a m
Mail and Express	4.40 p m
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Indianapolis, Ind.

LAKE ERIE & WESTERN RAILROAD. NATURAL GAS ROUTE

Solid Train Between
Sandusky and Peoria
—AND—
INDIANAPOLIS and MICHIGAN CITY,
FT. WAYNE and CONNERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger	7:00 a. m.
*No. 22 Passenger	1:20 p. m.
No. 24 Passenger	7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger	10:20 a. m.
No. 23 Passenger	2:50 p. m.
No. 25 Passenger	6:20 p. m.

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Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on A. H. SELLARS, Agent,
Lake Erie & Western R R.

C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

WEST and SOUTH

run the lines of the Illinois Central Railroad and the Yazoo & Mississippi Valley Railroad, reaching into the eleven States of

South Dakota Kentucky
Minnesota Tennessee
Iowa Arkansas
Wisconsin Mississippi
Illinois, Indiana, Louisiana,

Presenting an unequaled territory for diversified industries, and possessing

Fine Sites for New Mills, Best of Freight Facilities--Coal Fields--Close Proximity to Distributing Centers. Intelligent Help of all Kinds. Many Kinds of Raw Material.

To sound industries, substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered Textile Industries in the South by a number of good places. GEORGE C. POWER, Industrial Commissioner I. C. R. R. Co., Chicago.

ONLY $2.75

SEND NO MONEY. Cut this ad. out, and send to us, state your weight and height, also number of inches around body at bust and neck, and we will send this **BEAUTIFUL FUR TRIMMED BEAVER CLOTH CAPE** to you by express, C.O.D., subject to examination. You can examine and try it on at your nearest express office and if found perfectly satisfactory, exactly as represented and the most wonderful value you ever saw or heard of, pay the express agent our special offer price $2.75, and express charges. Express charges will average 40 to 60 cents for each 1,000 miles. **THIS CAPE IS LATEST STYLE FOR FALL and WINTER,** made from an extra fine and heavy all wool black or blue genuine Rariton Beaver cloth, 27 inches long, very full sweep, 13-inch upper cape, extra full. Upper cape and large storm collar, beautifully trimmed with black Baltic seal fur; upper cape trimmed with three rows and collar with two rows of fine mohair braid; cloth button ornaments. This cape is fine tailor made throughout and equal to capes that sell at more than double the price. Write for free Cloak Catalogue.

SEARS, ROEBUCK & CO., CHICAGO

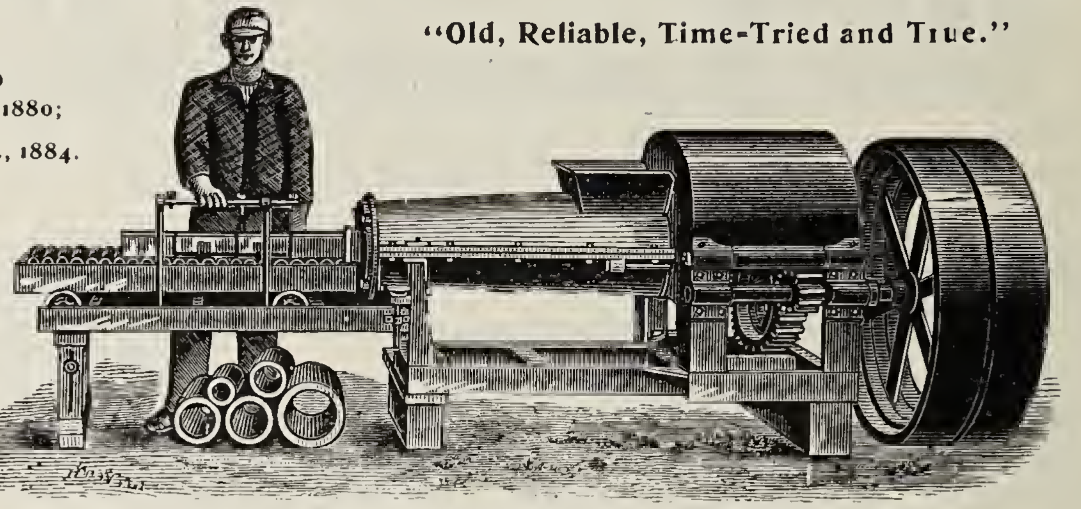
(Sears, Roebuck & Co. are thoroughly reliable—Editor.)

COPPER, ZINC AND WOOD
THESE ARE WHAT WE ENGRAVE ON.
REMEMBER: ONLY FIRST QUALITY.
INDIANAPOLIS ENGRAVING AND ELECTROTYPING COMPANY.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
June 22nd 1880;
and
February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞For Illustrated Circulars, Prices, Etc., address

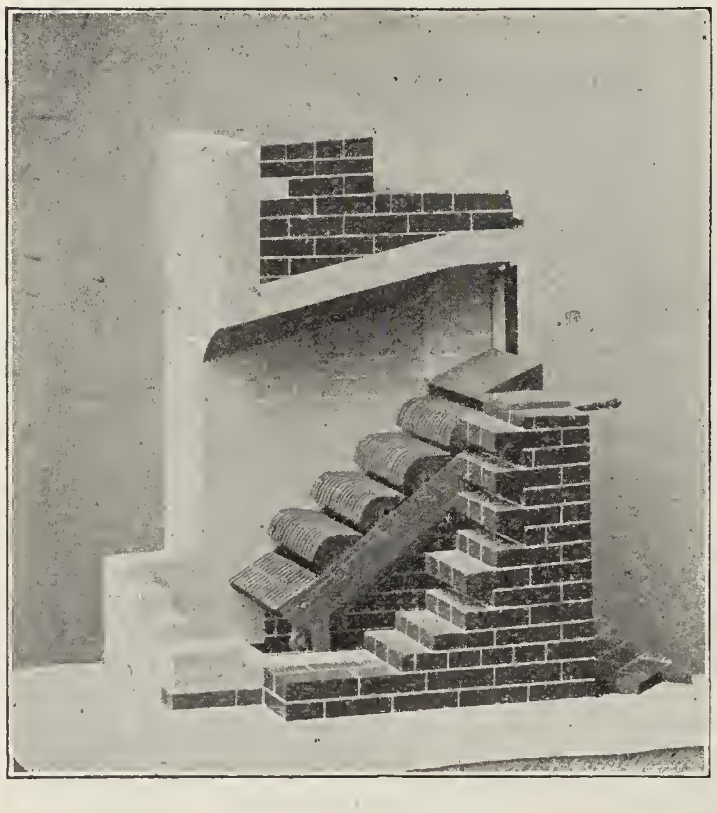
KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,
PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

The ALSIP IMPROVED.... KILNS

Have more points of superiority than any others on the market. Will be pleased to tell you all about its merits.



"PATENT APPLIED FOR."

The ALSIP KILN Furnace Grate,

Can be attached to any style of kiln furnace.

It is a coal coker and a gas generator.

Is self cleaning and has a gradual feed.

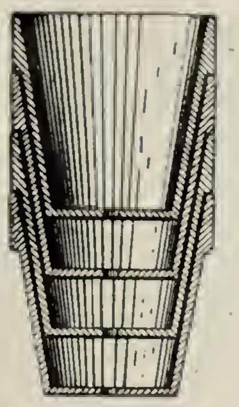
Is simple and durable.

Nothing but coal slack needed for fuel.

Guaranteed to save labor and fuel.

Investigate and be convinced.

S. H. ALSIP, *Belleville, Ill.*



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St., INDIANAPOLIS, IND.

ARE YOU SATISFIED WITH YOUR PRESENT INCOME?

If you are earning less than $75.00 per month and appreciate an independent position at which you can earn $150.00 and expenses per month (and many of our active men make more) you should communicate with us immediately.

IT COSTS YOU NOTHING TO WRITE US AND LEARN OF THE EXCEPTIONAL OPPORTUNITY WE OFFER TO THE RIGHT MAN.

WE WANT MEN EVERYWHERE. We want an active, industrious, reliable salesman in every town. We furnish FREE OF CHARGE everything required to place you immediately in position to earn **BIG WAGES** at high grade employment and keep you busy every day in the year, except Sundays.

Men in Every Walk of Life

AGENTS OF SUNDRY ARTICLES
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Clerks in General Stores
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AND MEN WHO HAVE HAD
NO PREVIOUS EXPERIENCE

ARE ON OUR LISTS OF SUCCESSFUL AGENTS.

NO MONEY
NO CAPITAL
NO EXPERIENCE
NO EXPENSE
NO INVESTMENT
NO RISK
NO COMMISSION PLAN
NO HOUSE-TO-HOUSE CANVASS

NO COMPETITION

NO MORE TIME and attention than you would put in to make a living at anything, will make for you

NO LESS THAN $5.00 A DAY SURE.

WE ARE THE WORLD'S LARGEST TAILORS. We buy our cloth direct from the LARGEST AMERICAN AND EUROPEAN MILLS. We control the entire output of several of these mills. We own our materials at the lowest possible cost, and operate the most extensive and economic tailoring plant in existence, and cut to measure and make to order **Suits and Overcoats from $5.00 to $15.00** (mostly $5.00 to $10.00). **Pants from $1.50 to $5.00. Fancy Vests from $2.00 up.** The days of ready-made clothing are numbered. **AT THESE PRICES** everyone will prefer to have his garments cut to **his** measure and made to his order. NO DIFFICULTY IN GETTING ORDERS.

OUR PLAN. If your references are satisfactory we start you out at once. We furnish you **FREE** a complete AGENTS' SAMPLE BOOK AND OUTFIT. Our large, handsome, leather-bound Sample Book contains our entire line of **Suitings, Overcoatings, Trouserings and Vestings**; full instructions for taking measurements (which you can learn in 5 minutes from the large photographic illustrations in the book), **colored lithographed fashion plates**, full description of the material underneath each sample, and prices left blank for you to fill in, fixing your profit to suit yourself. This Sample Book is put up in a **Fine Canvas Carrying Case**, which also contains **Tape Measure, Order Blanks, Business Cards, Stationery, Advertising Matter and Agents' Guide and Instruction Book, with Net Confidential Price List**, also complete **"Salesman's Talk."** Our instructions are so plain, our suggestions to the salesman so thorough that anyone can immediately make a success of the work. **You require nothing.** Just take the orders, send them to us, we make the garments promptly and send them by express C. O. D., subject to examination, and if not perfectly satisfactory they can be returned to us at our expense. Neither the agent nor his customer assumes the slightest risk. **We take all the chances of the transaction.** We either ship direct to your customers, collecting your full selling price and send you weekly check for all your profit; or, if you prefer, we ship direct to you at your net confidential price, allowing you to make your own collections. **You can add a liberal profit to your confidential price.**

NEARLY ALL OUR MEN MAKE $40.00 EVERY WEEK IN THE YEAR.

THE OUTFIT IS ABSOLUTELY FREE. **We make no charge for our complete Agent's Sample Book and Outfit**, but in order to protect ourselves against many who might impose on us by sending for the outfit (which costs us between $5.00 and $6.00), with no intention of working, but merely out of idle curiosity, we require each applicant to fill out the blank lines below, giving references, and further agree to pay **a temporary deposit of One Dollar and express charges** for the outfit when received, if found exactly as represented and really **a big money maker.** While this nominal deposit of $1.00 for the outfit is not one-fifth of its cost it insures the good faith of applicants, **and we promptly refund your $1.00 as soon as your sales amount to $25.00**, which amount you can take the first day out.

AMERICAN WOOLEN MILLS CO.

REFERENCES:
Corn Exchange National Bank
Any Express or Railroad Company
Any business man or resident
OF CHICAGO.

Fill out the following lines carefully, sign your name, cut out and send to us, and the outfit will be sent you at once.

AMERICAN WOOLEN MILLS CO., West Side Enterprise Building, **CHICAGO, ILL.**

GENTLEMEN:—Please send me by express, C. O. D., subject to examination, your Sample Book and Complete Salesman's Outfit, as described above. I agree to examine it at the express office and if found exactly as represented and I feel I can make good big wages taking orders for you, I agree to pay the express agent, as a guarantee of good faith, and to show I mean business (merely as a temporary deposit), **One Dollar and express charges**, with the understanding that the One Dollar is to be refunded to me as soon as my sales have amounted to $25.00. If not found as represented and I am not perfectly satisfied I shall not take the outfit or pay one cent.

....
Sign your name on above line.

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Name of Postoffice, County and State on above line.

Your age..

Married or single...

....

....
On above two lines give as references, names of two men over 21 years of age who have known you one year or longer.

....
In above line give name of your nearest express office.

Address your letters plainly to
AMERICAN WOOLEN MILLS CO., West Side Enterprise Bldg., **CHICAGO, ILL.**
(American Woolen Mills Co. are perfectly responsible, we know them personally.—Editor.)

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

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The only Direct Line to Manitou and Colorado Springs.

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ALSO BEST LINE TO DENVER.

Acknowledged by all to have the Best Dining Car Service.

Buffet Library Smoking Cars.

If you want a delightful trip on a strictly "Up-to-date" train travel by the GREAT ROCK ISLAND ROUTE.

For handsome book, "MANITOU AND THE MOUNTAINS," address
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The Philadelphia Commercial Museum,

DR. WILLIAM P. WILSON, DIRECTOR,

Supplies DETAILED, SPECIFIC INFORMATION concerning the TRADE CONDITIONS of the WORLD'S MARKETS.

It tells WHERE THE MARKETS ARE and by whom supplied.

Who the RESPONSIBLE BUYERS ARE, and HOW TO REACH THEM.

It can ascertain FOR YOU the particular REQUIREMENTS of any or all markets in THE LINE OF GOODS YOU MAKE.

It has inaugurated a most valuable method of REGISTERING AMERICAN MANUFACTURERS in Foreign Countries by means of

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Placed in the CHAMBERS OF COMMERCE in FORTY-FIVE of the PRINCIPAL COMMERCIAL CENTERS OF THE WORLD.

This is a movement in the Interest of American Commerce with which YOU SHOULD BE IDENTIFIED.

Write for particulars to

The Philadelphia Commercial Museum,

233 South Fourth Street,
Philadelphia, Pa.

Thurber Brick

Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas. Ft. Worth, Texas.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

Correspondence solicited.

Office and Works: Clinton, Ind.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING.

SYRACUSE, N. Y.

IOWA BRICK COMPANY,

MANUFACTURERS OF

Paving Brick

...AND...

Sidewalk Brick.

Equal to any brick made, as the many tests have proved.

Samples sent on application. Write for prices.

IOWA BRICK CO.,

Des Moines, Iowa.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT,
COALDALE, ALA.
TELEGRAPH OFFICE,
WARRIOR, ALA.

BRANCH OFFICES,
BIRMINGHAM, ALA.,
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The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

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OFFICE: 306 Opera House,
TERRE HAUTE, IND.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO., Publishers.
INDIANAPOLIS, IND., U. S. A.

J. L. HIGLEY & CO.,

CANTON, OHIO.

—•—

Four of the largest and best paving brick plants in the world.

Canton Paving Block,

Head the list for uniformity, finish and wearing qualities.

Samples sent free on application.

Write for prices.

T. B. McAVOY,
PRESIDENT.

FRANK B. McAVOY,
SEC. AND TREAS.

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McAvoy Vitrified Brick Co.,

of PHILADELPHIA,
PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA.
WORKS:—PERKIOMEN JUNCTION, PENN.

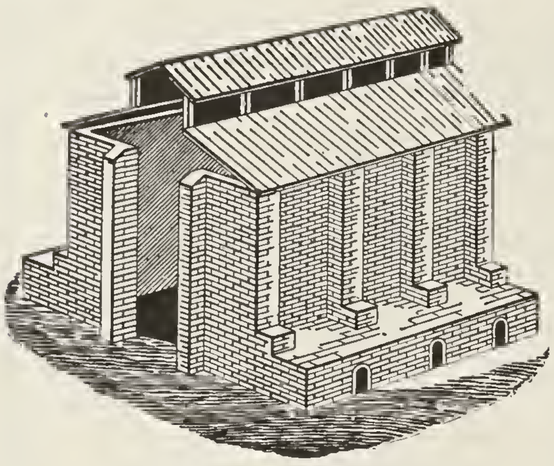
HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**

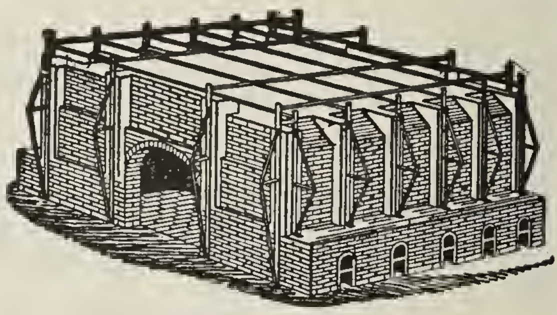


Up-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, **2,422 Chestnut St.,** ***Kansas City, Mo.***

MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,

P. O. Box 335. ***ROME, GA., U. S. A.***

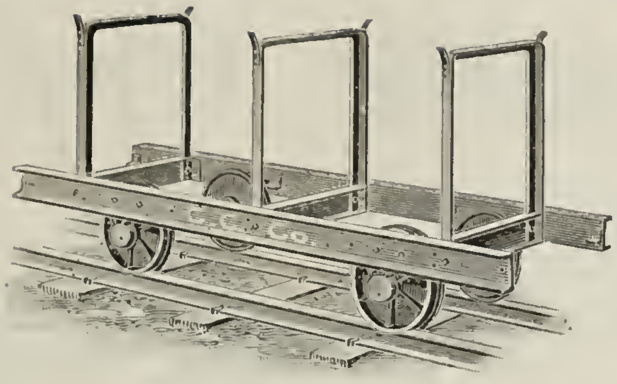
The Bushong Down Draft Kiln

Is so constructed that the **heat** is **equally distributed** to **all parts** of the **Kiln.**

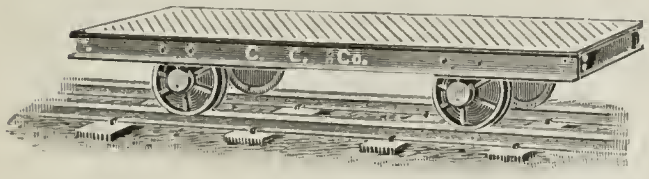
For **uniform** and **all hard burning** this kiln leads them all. Built any size desired. This kiln is now being used by some of the largest brick plants in the country.

For further particulars, address

M. M. BUSHONG, - Phoenixville, Pa.



No. 231 DOUBLE DECK.

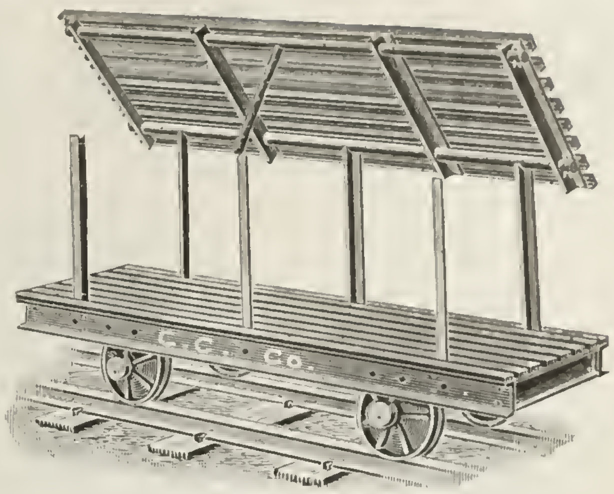


No. 214 SINGLE DECK.

CHANNEL
STEEL
BRICK CARS.

Quality Unexcelled.
Prices Reasonable.

Cleveland Car Co.,
150 Scranton Ave., CLEVELAND, OHIO.



No. 232 DOUBLE DECK, with Steel Decks.

Please Mention The Clay-Worker.

Have You Ever Considered This?

That a Very Small Quantity of

Dixon's Ticonderoga FLAKE GRAPHITE.

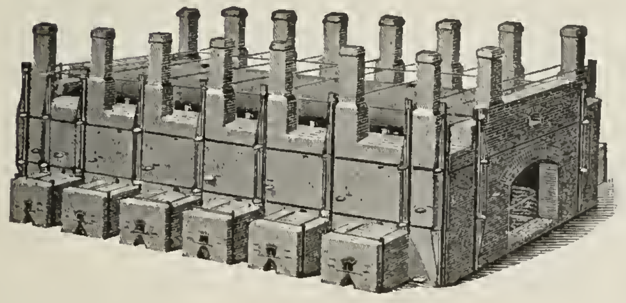
Say 5 to 10 per cent. added to the grease or oil that you are now using, will make you oil or grease do three to six times as much work and do it much better.

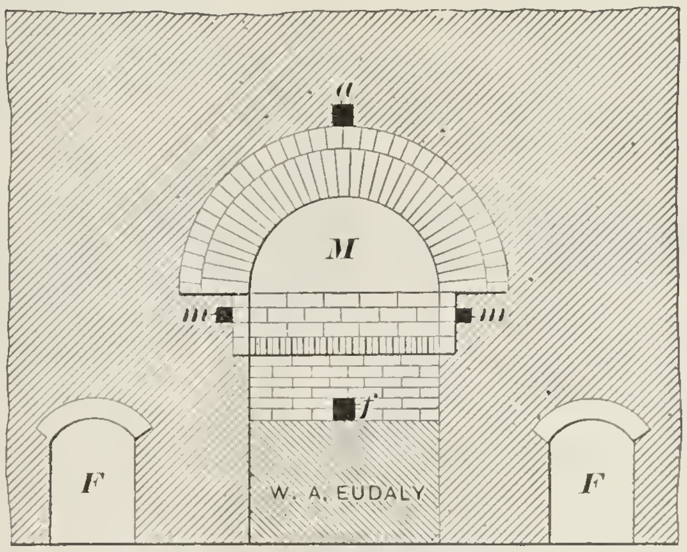
This has been fully demonstrated but if you want to prove it for yourself we will send you samples free of charge and a pamphlet giving full particulars.

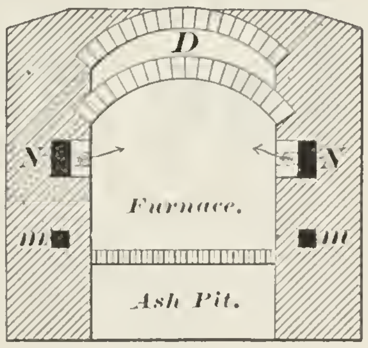
JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.







These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

9 Outfits in One Month. Why?

They are { BUILT RIGHT,
SOLD RIGHT.

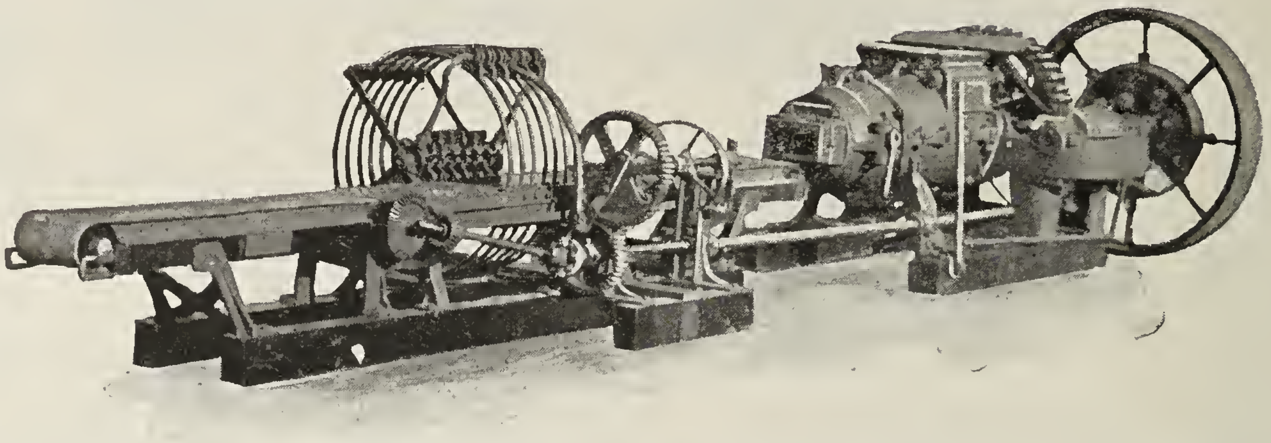
Pendleton, S. C., April 19, '99.

GENTS:

The Automatic Side Cut Table is the finest thing of the kind I have ever seen.

J. C. STRIBLING.

END OR SIDE CUT BY CHANGING REEL FRAME.



X-tra and Automatic Side Cutter.

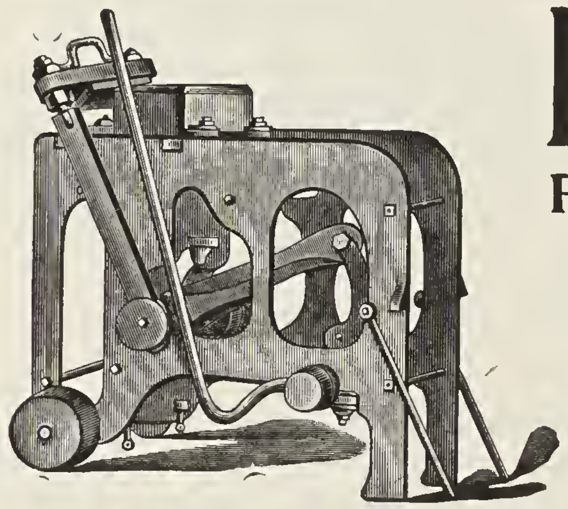
J. C. STEELE & SONS, Manufacturers of The "NEW SOUTH" BRICK MACHINERY, **Statesville, N. C.**

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.

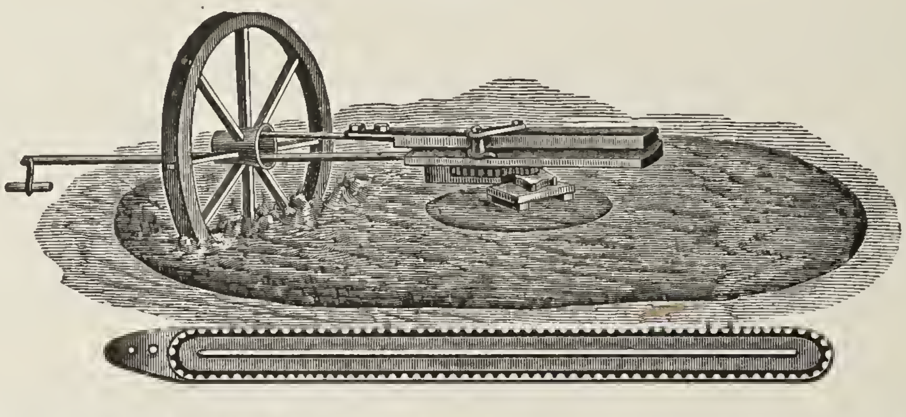


RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

☞ Send for Circular and Price-List.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

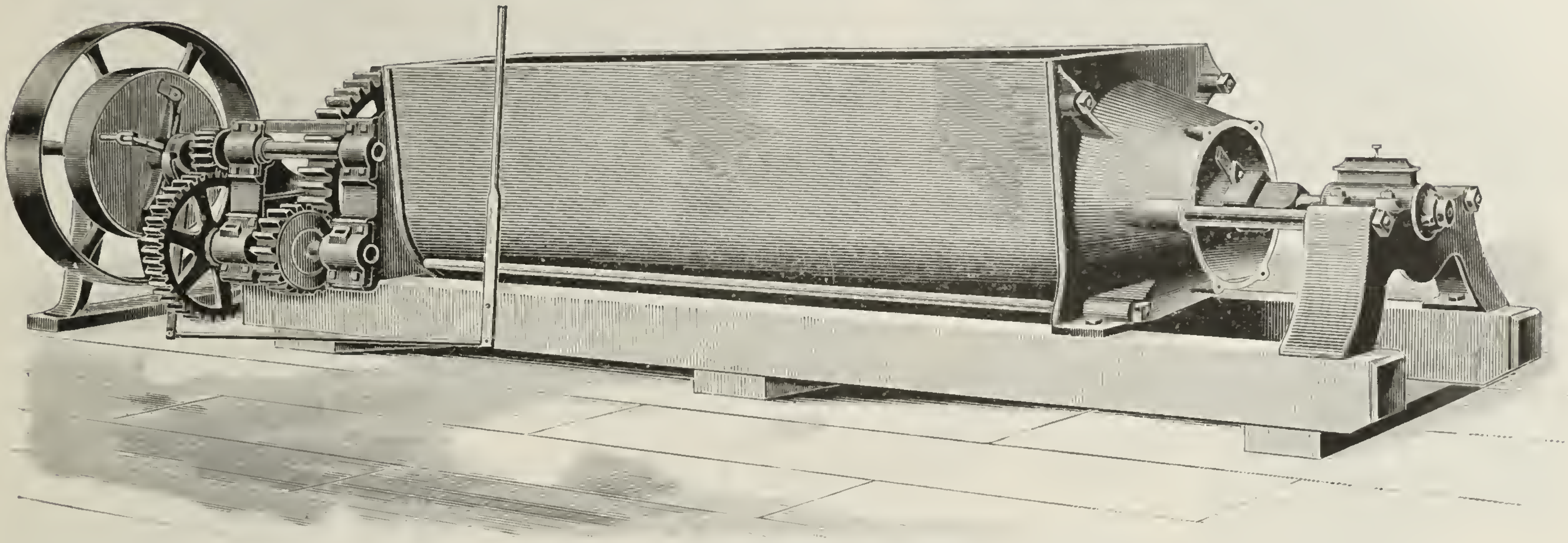
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.

A GOOD THING.



Leader Pug Mill, Size No. 9.

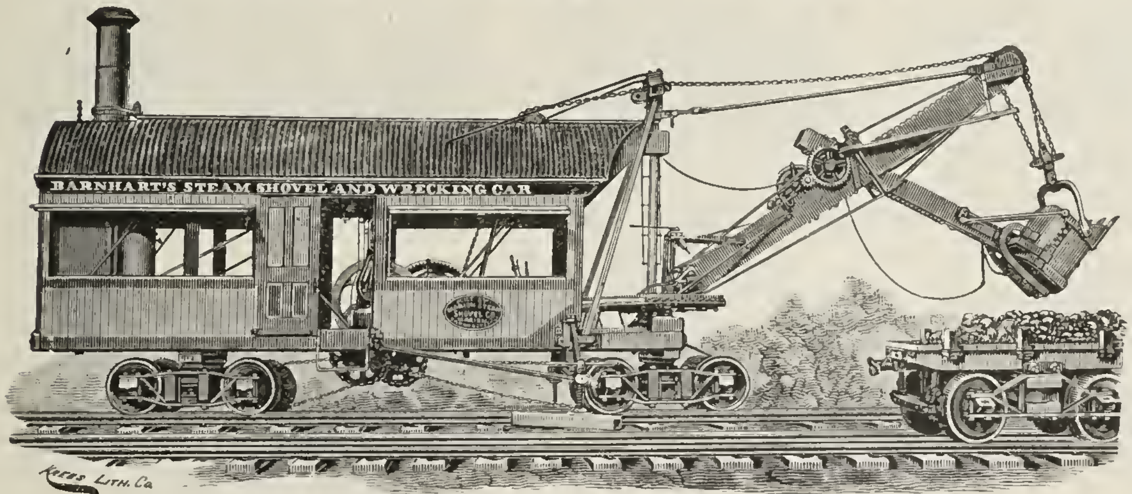
Send for circulars of our **Leader Machinery.**

Brick Machines, Pug Mills, Crushers, Disintegrators, Automatic Cutters, Etc., Etc.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.


BARNHART'S STEAM SHOVEL AND WRECKING CAR

STYLE A—1½ YD.

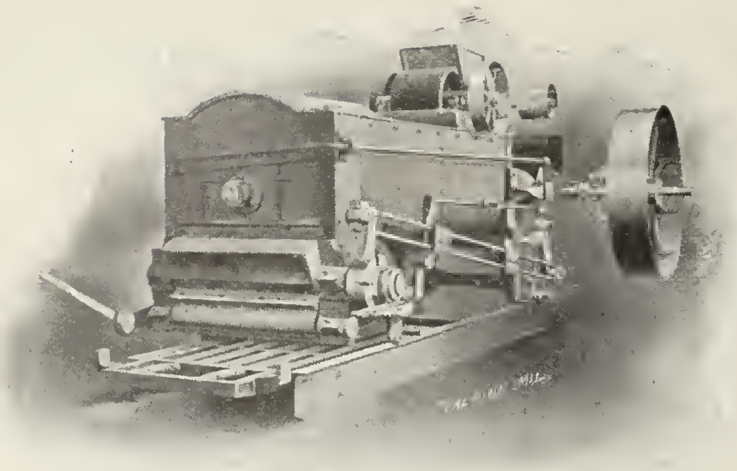
We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**

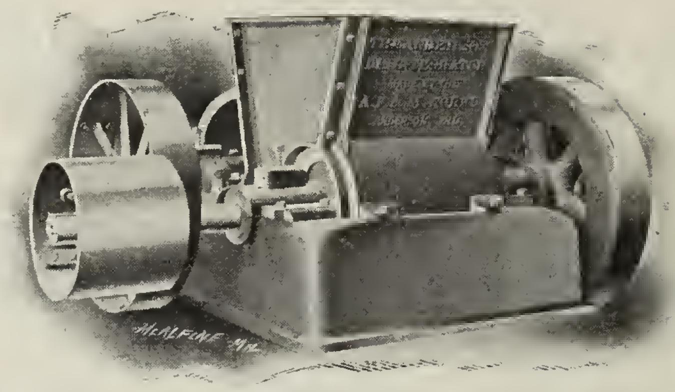
STYLE C—¾ YD.



Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



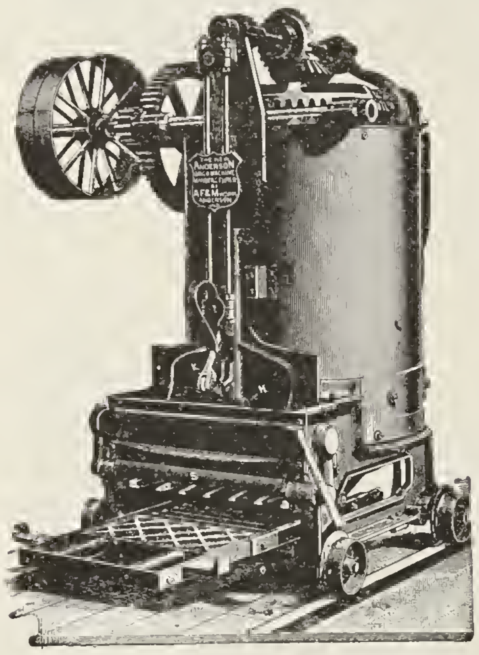
Best Disintegrator on the Market.

MANUFACTURERS OF....

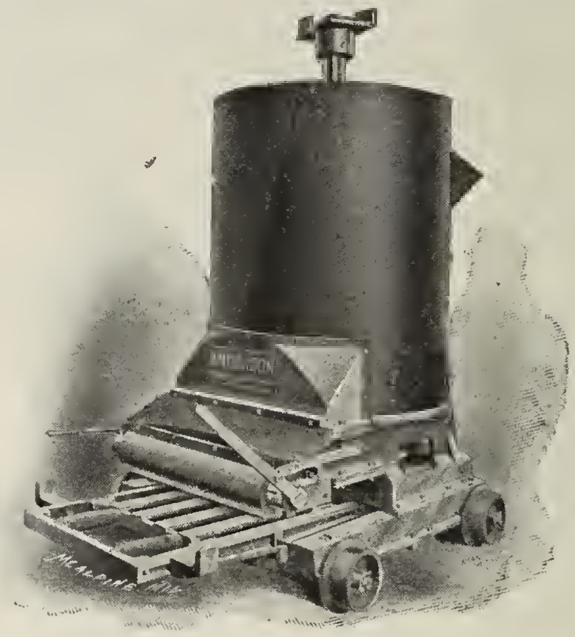
New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,
And all Brickyard Supplies.



Steel and Iron Upright Stock Brick Machine.



1899 Horse Power Machine.

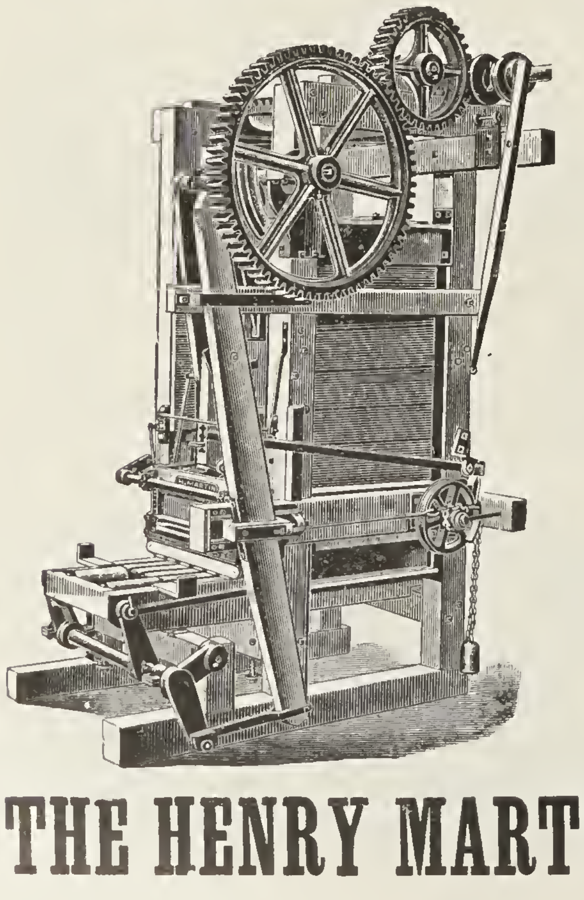
The Anderson Foundry and Machine Works,
Anderson, Ind.

60,000 First Class Soft Mud Brick in 10 Hours

ON A

"MARTIN" STYLE "A" STEAM POWER BRICK MACHINE,

Is the record of one of our Customers in Philadelphia, Pa.



Another in Oregon says:

"Your machine is King of all."

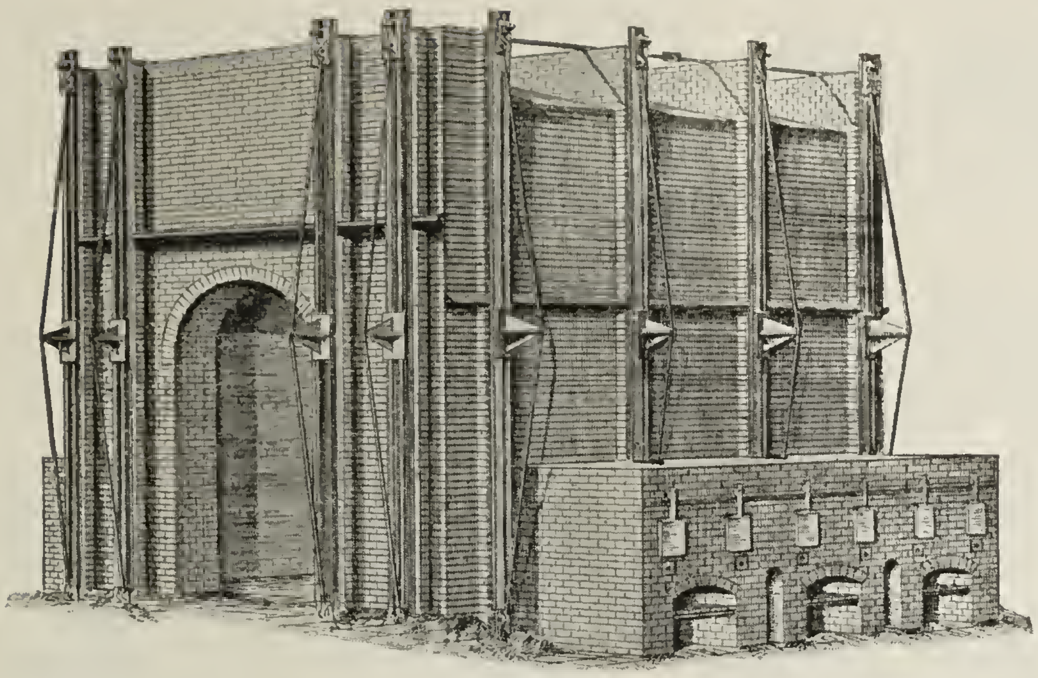
Still another in Nebraska:

"Have just secured a contract for 2,000,000 brick and distanced all competitors; not in price but quality. Thanks to the "Martin."

Many Others are Equally as well Satisfied.

Our catalogue sent on request.

THE HENRY MARTIN BRICK MACHINE MFG. CO., LANCASTER, PENN., U. S. A.



PATENTED.

The GRATH
IMPROVED...,.
DOWN=DRAFT
KILN

With Gas and Coking Furnaces Attached.

This kiln will burn a larger percentage of face, also vitrified brick, than other kiln in the market. **The GRATH KILNS** are in use at the works of the American Hydraulic Press Brick Co., Collinsville, Ill.

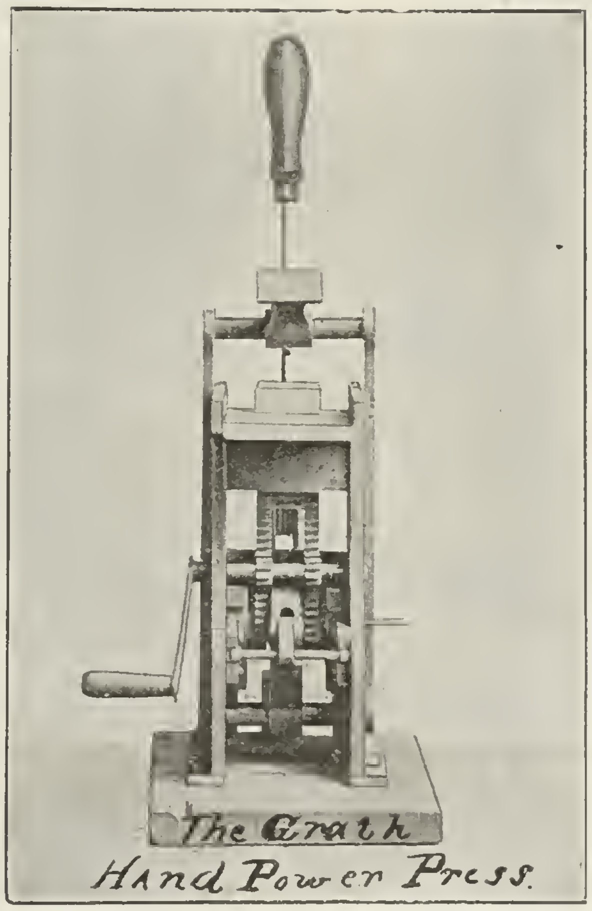
The Grath Gas and Coking Furnace

Is the Simplest, Best and most Durable Coking Furnace in the Market. Can be attached to either **Down** or **Up** Draft kilns and is guaranteed to give satisfactory results.

◆

The Grath Dry or Semi=Dry Clay Hand=Power Press

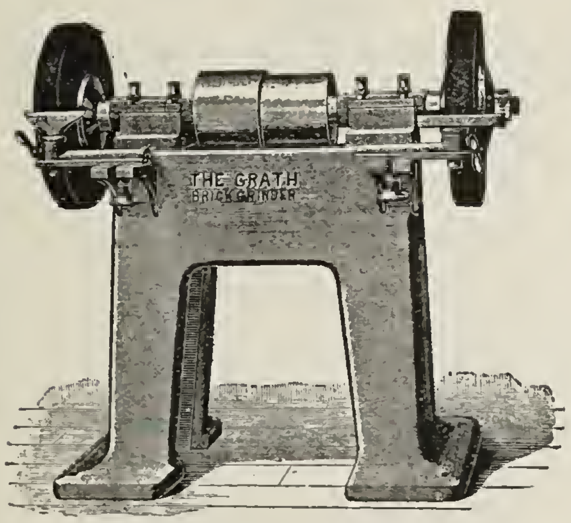
For plain or ornamental press brick, The only successful press of its kind in the market. Simple, durable and powerful. No brickyard complete without this press.



◆

The Grath Brick Grinding Machine

For grinding Arch and Radius Brick of any hardness, even to a Vitrified brick. Simplest and Best in the market. No sand, no discoloration, which means satisfaction.



The Cheapest Grinding machine in the market

In use by American Hydraulic Press Brick Co., Collinsville, Ill.

◆

Simplicity and Durability,

IS OUR MOTTO.

◆

FOR FURTHER INFORMATION ON ABOVE, ADDRESS

The ILLINOIS SUPPLY & CONSTRUCTION CO.,
St. Louis Mo.

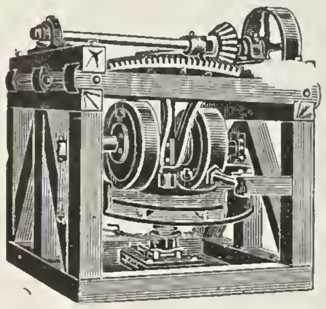
STEVENSON & CO., WELLSVILLE, OHIO, U. S. A.

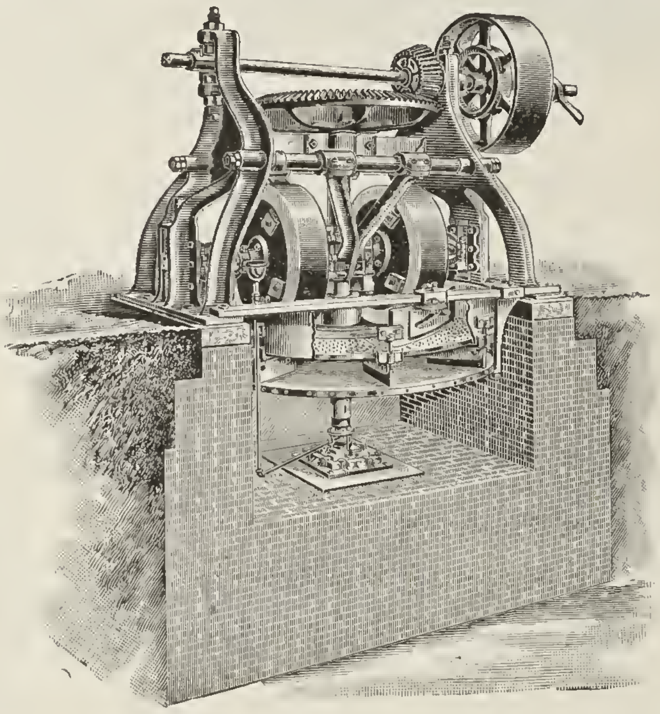
MANUFACTURERS OF

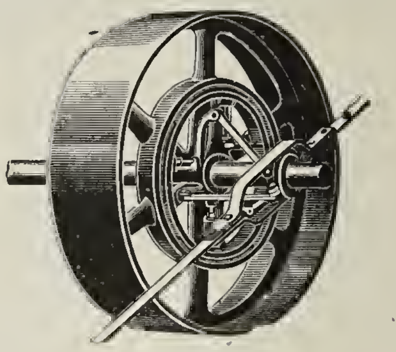
Brick Machinery.

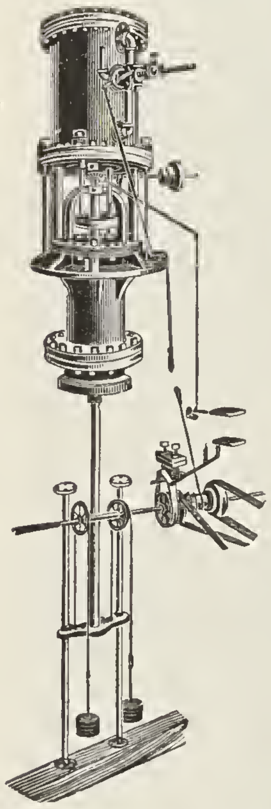
COMPLETE EQUIPMENTS.

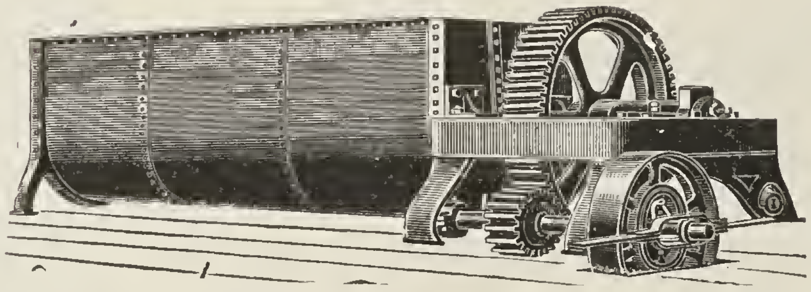
Tile Machinery

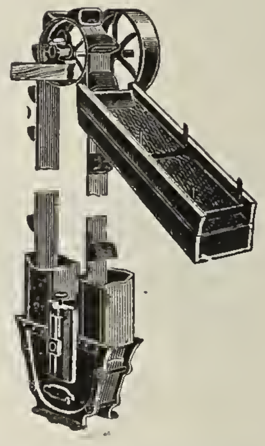












Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.

We Lead! Others Follow!

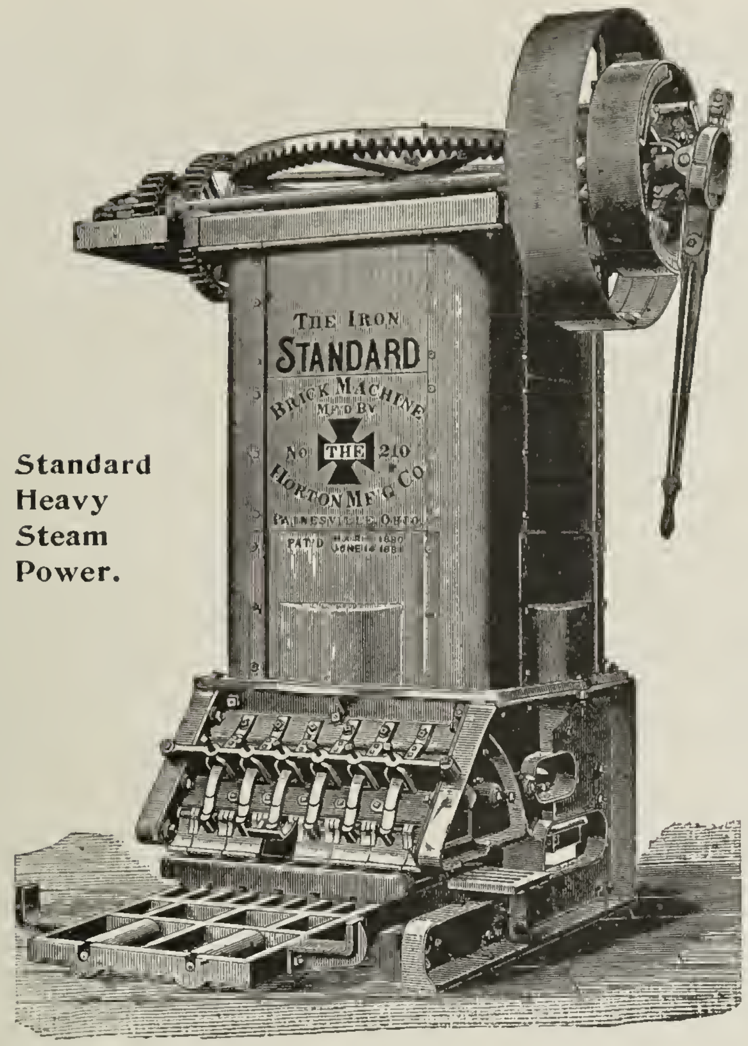
• • •

The Hercules!

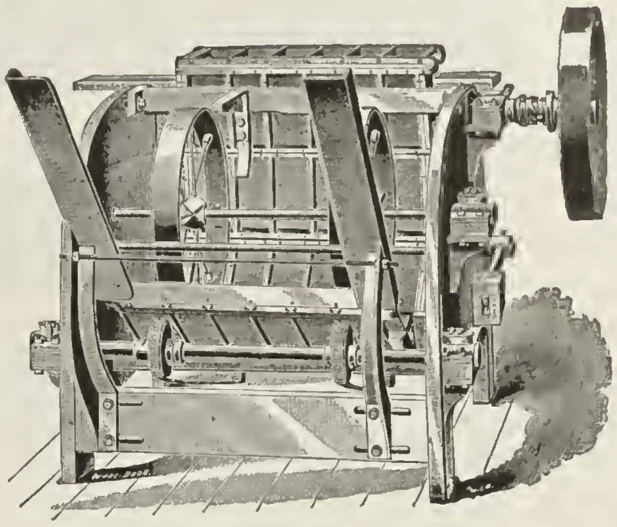
Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

The Standard Machine is just what its name implies.

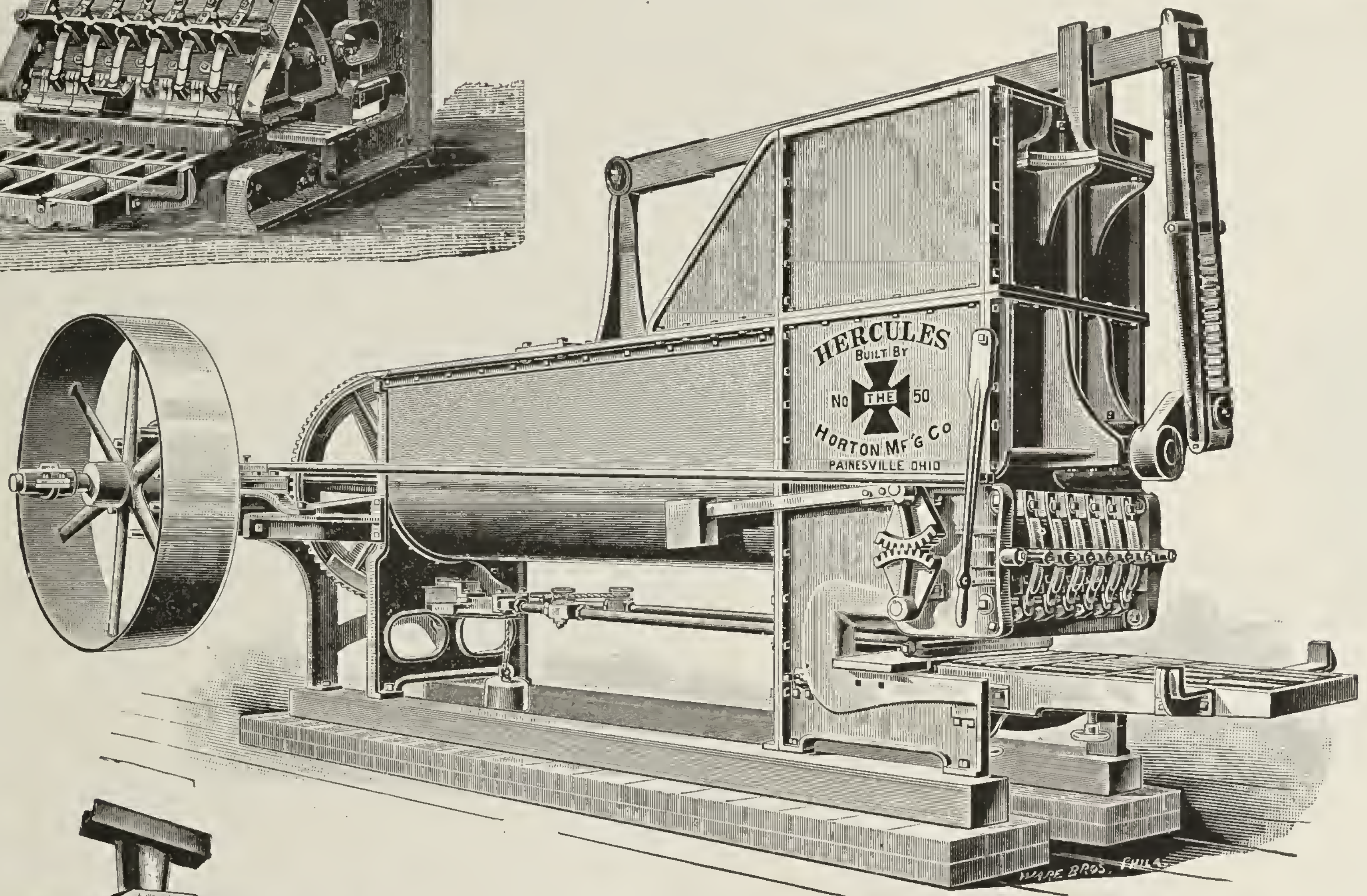
SEND FOR
1899 CATALOGUE.



Standard
Heavy
Steam
Power.

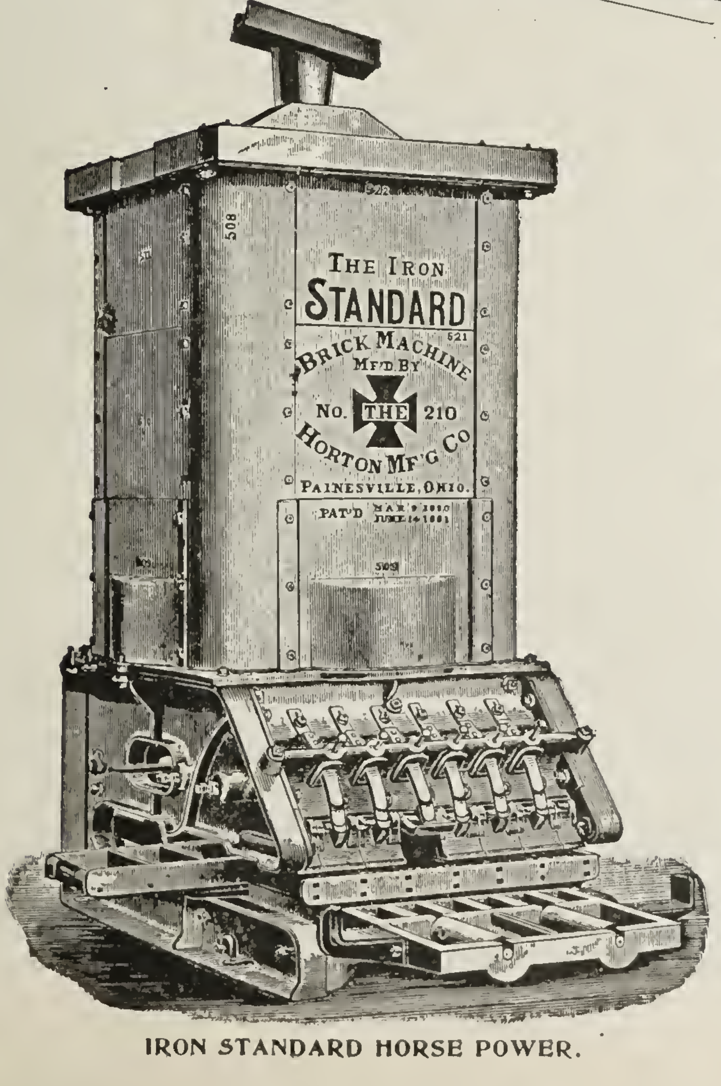


HORTON MOLD SANDER DIRECT FEED.

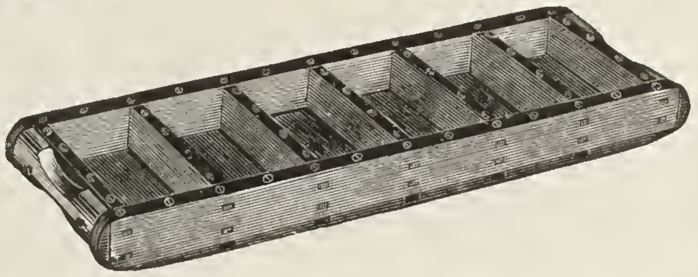


Hercules capacity 40,000
to 50.000.
Weight 15,000 pounds.

We are making a special drive on Molds this season. Send for our new circular on molds.



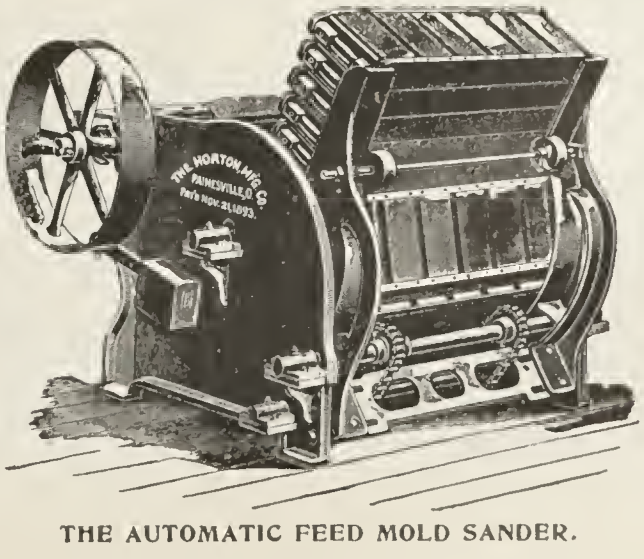
IRON STANDARD HORSE POWER.



WE HAVE recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.

The HORTON MANUFACTURING COMPANY,

PAINESVILLE,
OHIO.



THE HORTON MF'G CO
PAINESVILLE, O.
Pat'd Nov. 21, 1893.

THE AUTOMATIC FEED MOLD SANDER.

Built Right
Run Right.

• • • •

OCTOBER, the Indian Summer month, is upon us. Nature pours forth her choicest fruits to those who have striven hardest to gain her favor.

What has been the fruits of your labors? Has the past season been a successful one? Has it been as satisfactory as your could desire? Perhaps your equipment has been faulty, your machinery may be out of date or out of repair. No matter where the trouble is we can remedy it for next season by the introduction of our superior line of machinery and your next season's profits will show a satisfactory improvement.

The
Machinery
that never
Disappoints

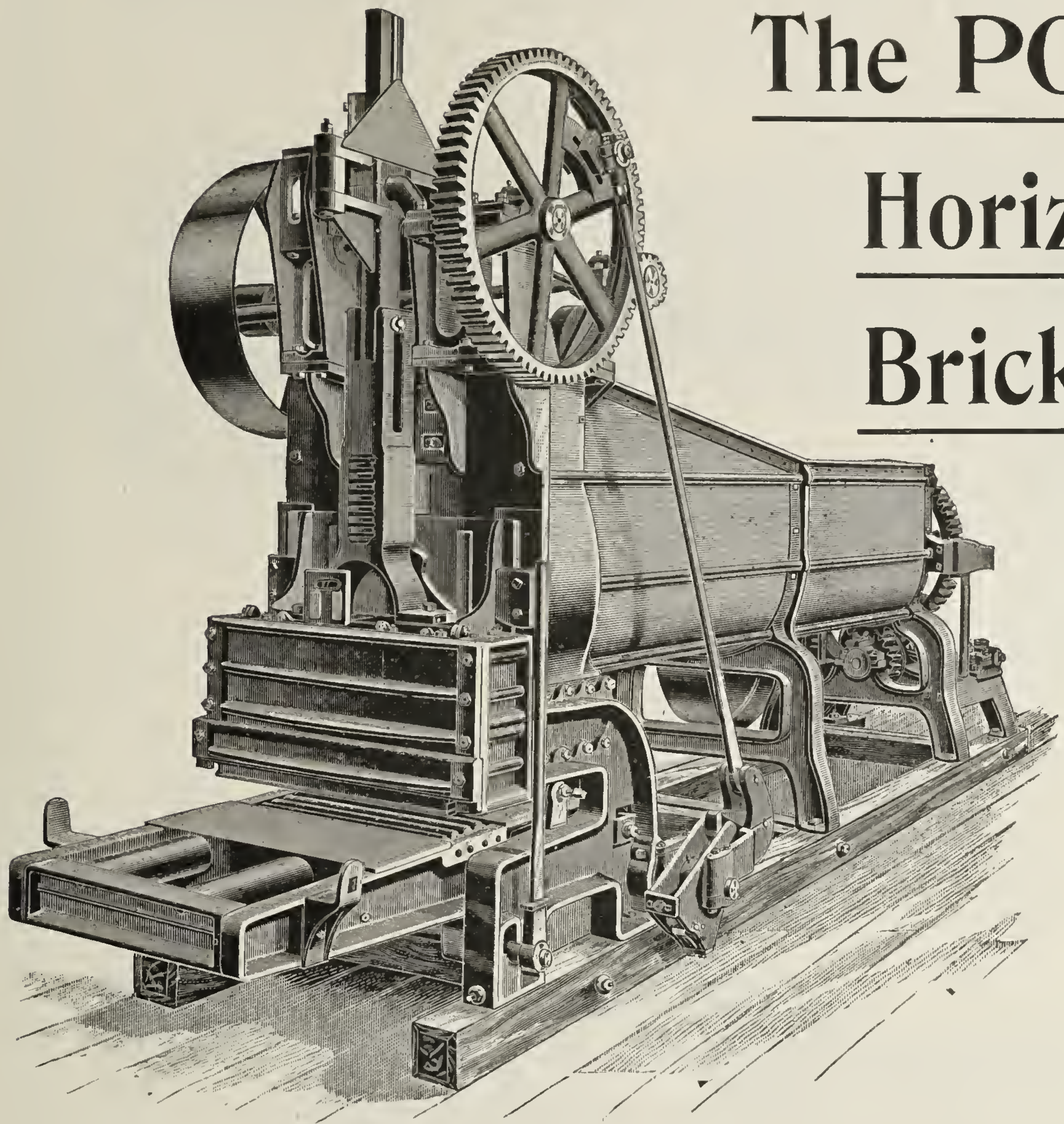
Its a simple problem: We increase the quantity and quality of your product and reduce your expense of operation. The saving is profit. Its all because our machinery is

Built Right
AND
Runs Right.

• • • •

We build all capacities of Clayworking Machinery.
WRITE TO-DAY.

We make a Specialty of erecting Complete Soft Mud Plants.



The POTTS Horizontal Brick Machines,

DISINTEGRATORS

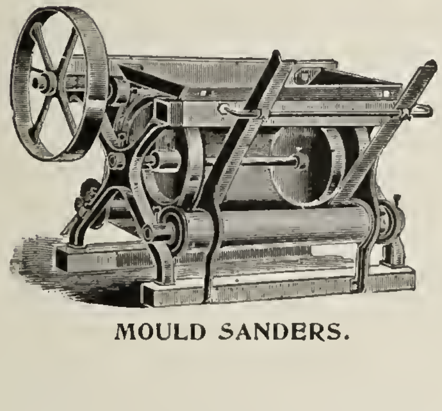
....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

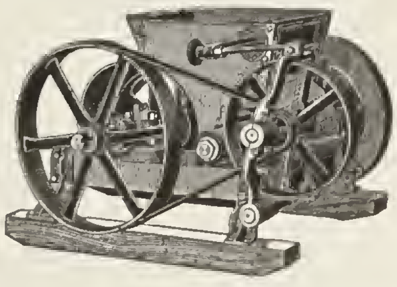
The best built, heaviest and strongest Machinery made.



MOULD SANDERS.

WE MANUFACTURE EVERYTHING NEEDED ON THE BRICKYARD.

WE MAKE A SPECIALTY OF BRICK MOULDS.



DISINTEGRATORS.

When in need of Machinery or supplies, we can save you money.

C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE
JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

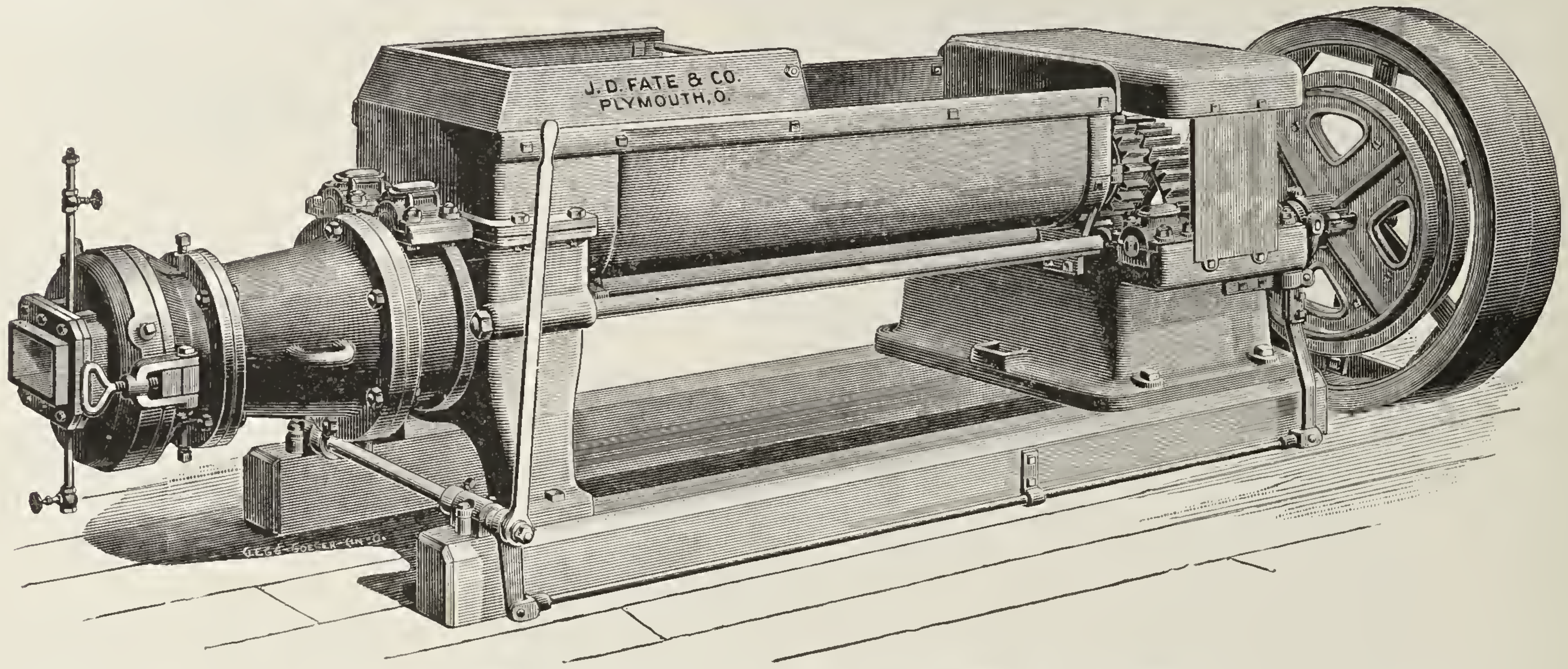
J. D. FATE & CO.,

Manufacturers of

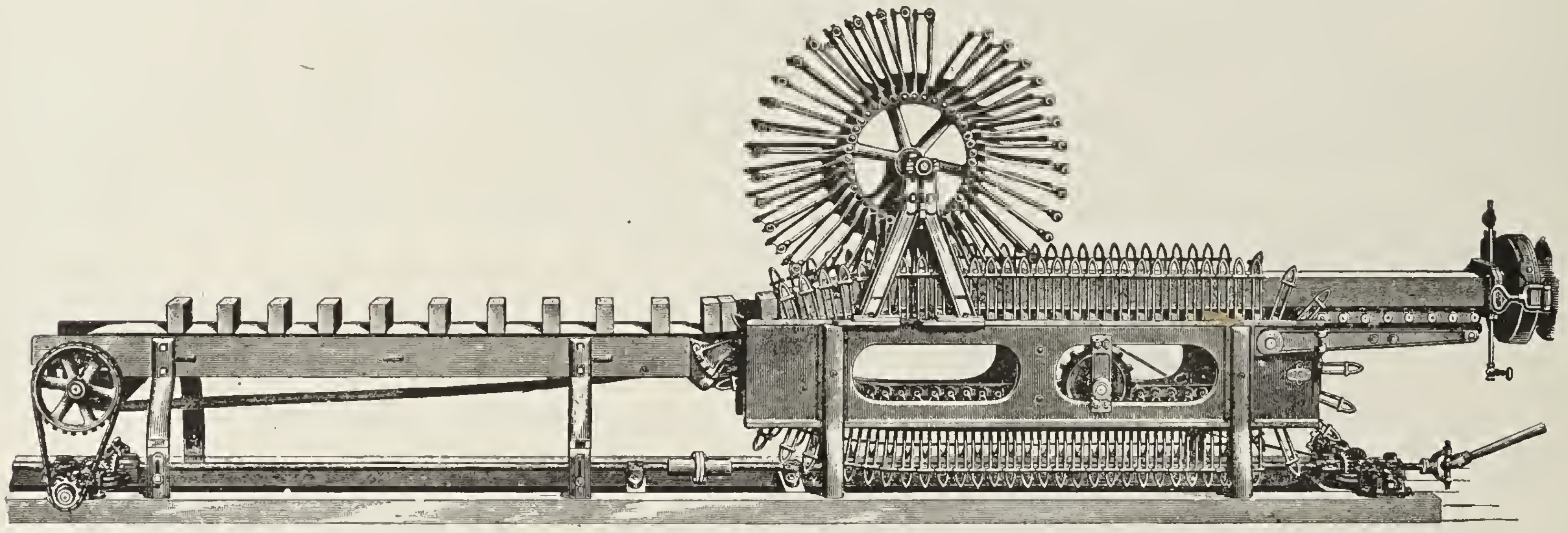
BRICK AND TILE MACHINERY.

PLYMOUTH, OHIO.

Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.


J. D. FATE & CO.
PLYMOUTH, O.

"HUMMER" COMBINED PUG MILL AND BRICK MACHINE.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.

Des Moines, Iowa, May 11th, 1899.

J. D. FATE & CO., Plymouth, Ohio.

Gentlemen:—We are so well pleased with the Automatic Side-cut Brick Machine that we purchased from you this Spring that we feel it our duty to send you a testimonial. We feel safe when we say it has no equal, but we are sure when we say it has no superior, because it is perfect when it comes to making a nice, square brick. We have tried it in all kinds of clay that we have here, and it makes no difference, it runs just the same. We can now make a fancy face brick, which we could not do before. We do not use power to drive the wheel—the column of clay runs it nicely. We feel that it is the best investment we ever made. If you have any prospective customer in our neighborhood, send him to our yard to see the machine, and we will venture to say he will buy your machine.

Very respectfully yours, NEWMAN BRICK & COAL CO.

Correct in principle and mechanism.

Simplicity itself—nothing can get out of order unless broken by carelessness.

Strong and of long life—all its motions being continuously rotary.

The parts work together without jarring.

There is no halt or hesitation—every motion is prompt and positive.

Requires no expert to keep it running or in repair.

The column of clay, assisted by friction, runs the table, but all movements are regulated by clay column. When the column goes, table moves, and stops when it stops.

Breaks less than one-tenth the cutting wires that others do, and if wires are broken may be easily replaced without stopping.

The brick cut are square and true, with sharp edges and corners, and equal to the finest Press Brick.

The first brick is as good as the last, and the last as the first.

Cutting capacity practically unlimited.

"Soft Mud" Brick Machinery, both Steam and Horse Power in addition to our full line of "Stiff Mud" Machinery.

ASK FOR CATALOGUE AND PRICES.

JULY 4,
1859.

FORTY

YEARS OF

SUCCESS!

H. BREWER & CO.,

TECUMSEH, MICH.

WIRE CUT and MOLD PRESS,

Brick Machines.

Best
Tile
Machines
IN
America.

Milledgeville, Ga., May 16, 1899.

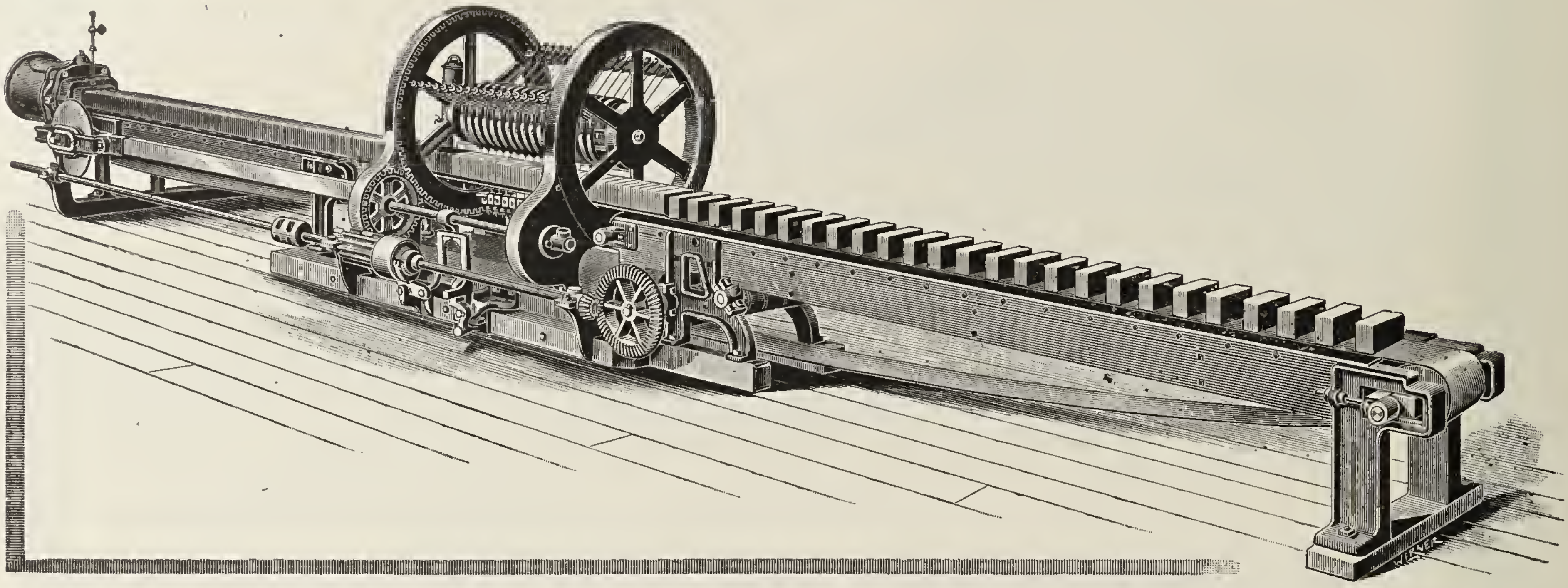
MESSRS. H. BREWER & CO.,

I was raised at the brick business, and my father before me. Have been to many brickyards in different parts of America and in the old country, and have never seen a brick machine that makes as nice and good brick from stiff clay as your No. 12 Mold Machine. I have worked wire cut machinery for 18 years, and made brick as good as were demanded, but your No. 12 Mold Machine for the clay I am now working makes finer brick than I ever made on a wire cut.

Very respectfully,
J. W. McMILLEN.

FINALLY

Side Cut Brick Automatically Cut With SMOOTH EDGES.



A New Rotating Cutter for Side Cut Brick.

POINTS.

Of simplest construction. Entirely automatic and positive in operation.

A combined downward and lateral movement of the wires insures brick with **smooth edges.**

The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.

Cutting wires are short and make a square and straight cut.

New wires easily put on without stopping, stooping or poking end of wire through a hole.

More than twice as much time is afforded for renewing wires as in other cutters.

Movement of all parts is slow.

Clay does not propel cutting wires.

No auxiliary or friction belts used.

No tensions to regulate.

No regulation or adjustment required.

No crank or pitman rod used.

No reciprocating wire frame used.

No machinery underneath.

Absence of all complicated gearing.

Cannot miss a cut or cut a crooked brick

All the brick are of the same thickness.

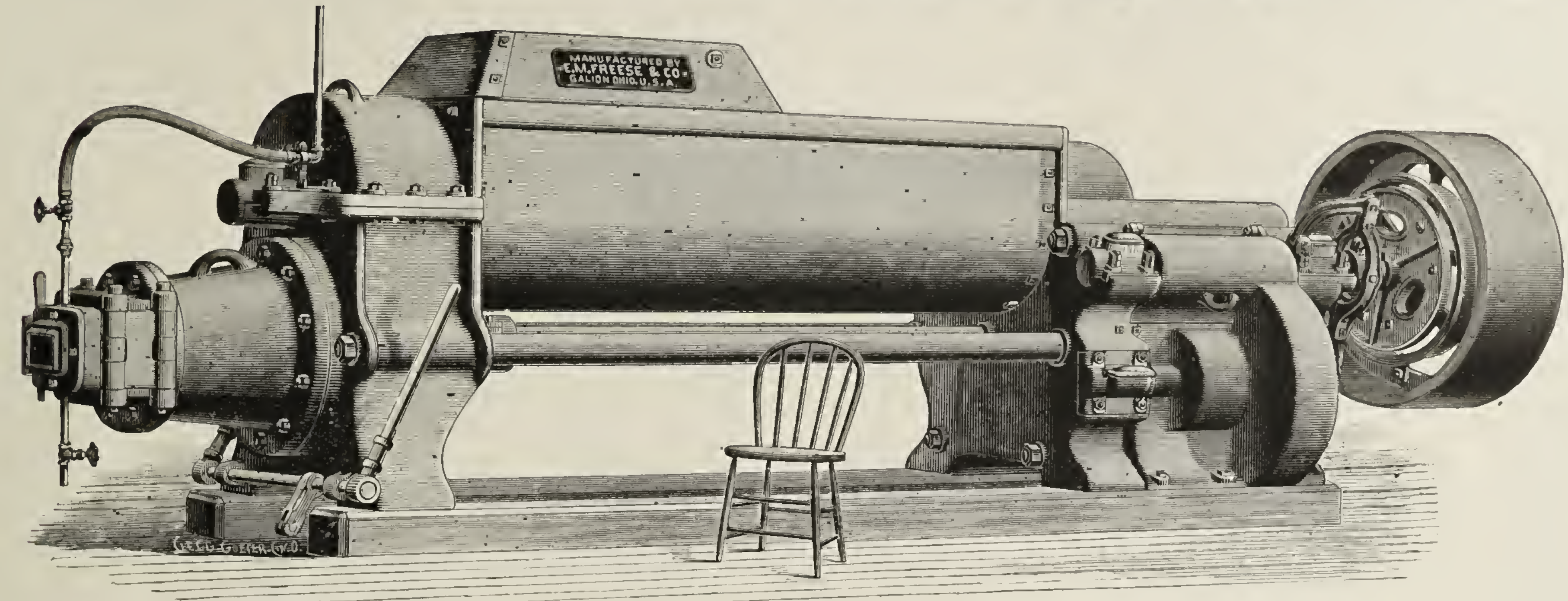
Substantial and durable in all parts.

Capacity ample for any brick machine.

E. M. FREESE & CO.,

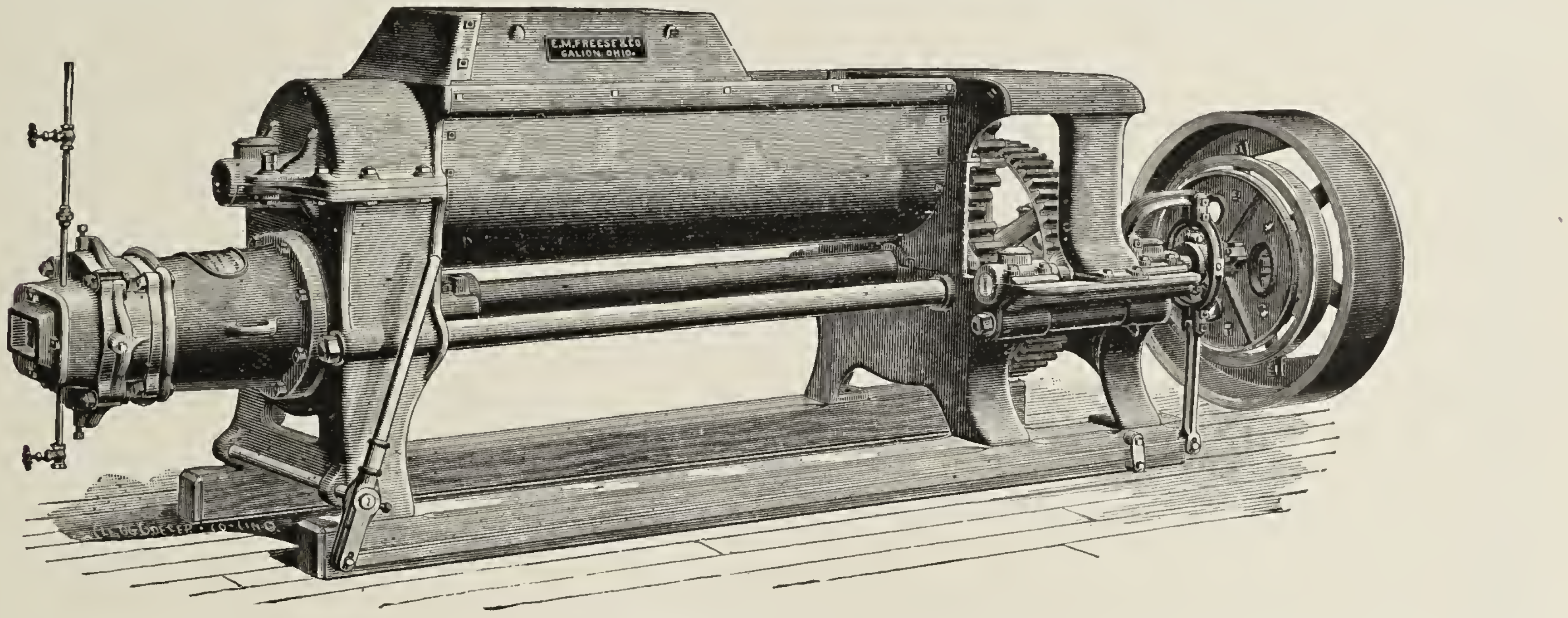
Galion, Ohio.

The Original Union Brick Machines


MANUFACTURED BY
E.M. FREESE & CO.
GALION OHIO U.S.A.

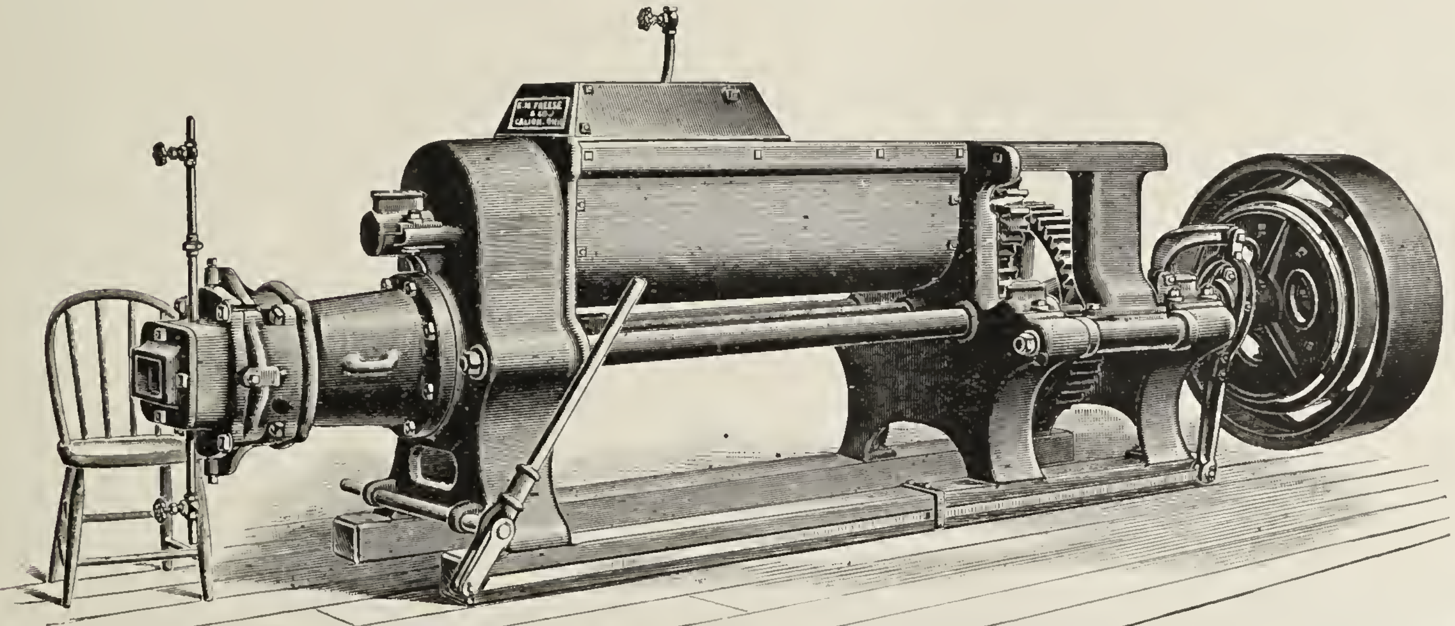
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

* * *

These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

* * *

E. M. FREESE & CO., Galion, Ohio.

"New Haven" Brick Machines

Are at This Time the

Leading Soft Clay Brick Machines of America.

SIMPLY BY REASON OF THEIR GREAT STRENGTH, THOROUGH CONSTRUCTION, SIMPLE DESIGN and EFFICIENCY.

DON'T YOU THINK it's about the right time to find out if the above statement is true.

Come and see the machines we are building or go and see those in use.

A list of some brickmakers having our machinery in use may be had for the asking.

INVESTIGATE AND YOU WILL BUY OF

The Eastern Machinery Co.,

NEW HAVEN, CONN.

DO YOU WANT THE

BEST BRICK DRYER?

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel. It is a fuel saver and hence a money maker.

If you want the best and most economical brick dryer don't fail to get our prices. If you want a cheap dryer, its no use to write us for we don't build that kind.

◆

Read what H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE: 60TH AND HAVERFORD STS. TELEPHONE 147, W. P.

H. C. CARROLL & SONS,

Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS:
57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

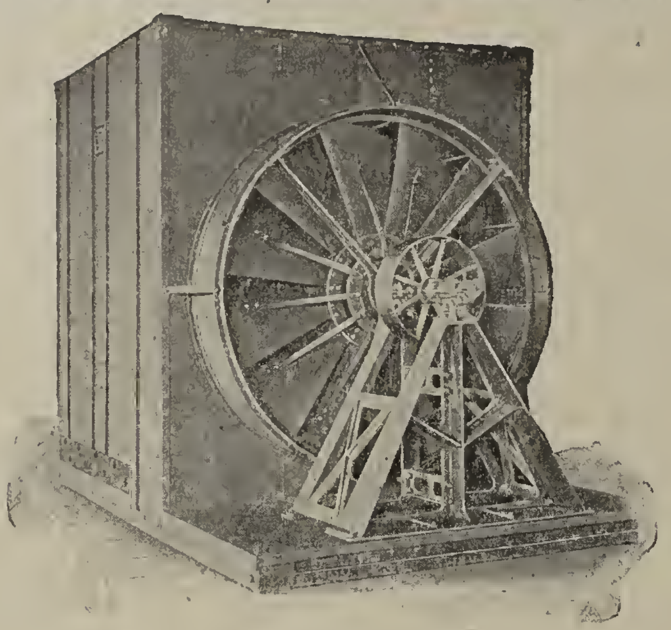
◆

The Cummer Clay Dryer is now in successful operation at many places in the United States. Like our brick dryer it is fully guaranteed to perform its work in the most effective manner possible and in any desired capacity. The **Cummer Dryer** succeeds where others fail. It will afford us pleasure to demonstrate its superiority over all other dryers.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell you troubles to"

The F. D. CUMMER & SON CO.,

CLEVELAND, OHIO.



Do You Want to Increase Your Profits?

You'll find upon investigation that a positive means to that end is an

"A. B. C." BRICK DRYER.

MANUFACTURED ONLY BY

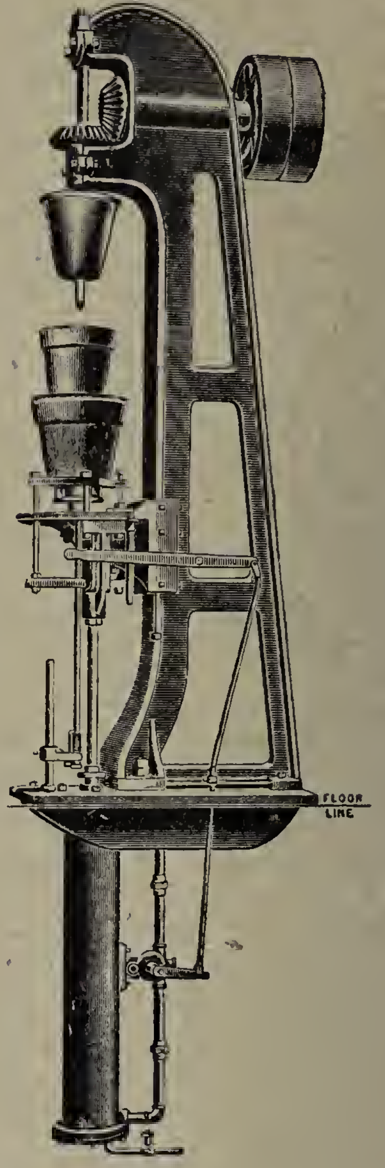
American Blower Company.
DETROIT, MICH.

The Turner, Vaughn & Taylor Co.,

CUYAHOGA FALLS,
OHIO, U. S. A.

MANUFACTURERS OF
ALL KINDS OF

Clayworking Machinery.



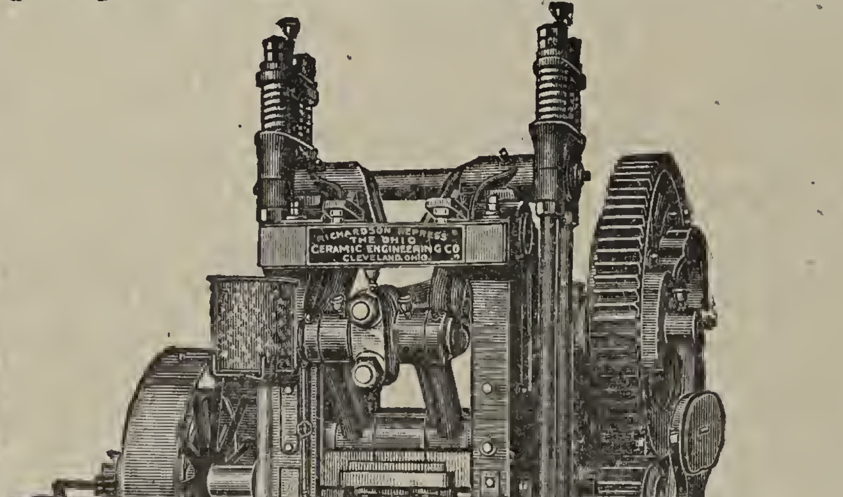
The accompanying cut shows our improved machine for making

Bessemer Converter Nozzles, Sleeves, Runner Brick, Bowls and FLOWER POTS of ALL SIZES.

We also make the BEST

SEWER PIPE PRESSES,
GRINDING PANS (Wet and Dry.)
PUG MILLS, Etc., Etc.

DONT FAIL to get OUR PRICES if You Want the BEST MACHINERY.



THE RICHARDSON REPRESS.

RESULTS

That's what you want your Brick Machinery to produce.

WE BUILD THAT KIND.

SEND FOR CATALOGUE.

The OHIO CERAMIC
ENGINEERING COMPANY,
. . . . Cleveland, Ohio.

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THE CLAY WORKER
A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS.
INCLUDING BRICK TILE TERRA COTTA SEWER PIPE POTTERY ETC.
T. A. RANDALL & CO., PUBLISHERS.
CHANDLER SC. INDPLS.

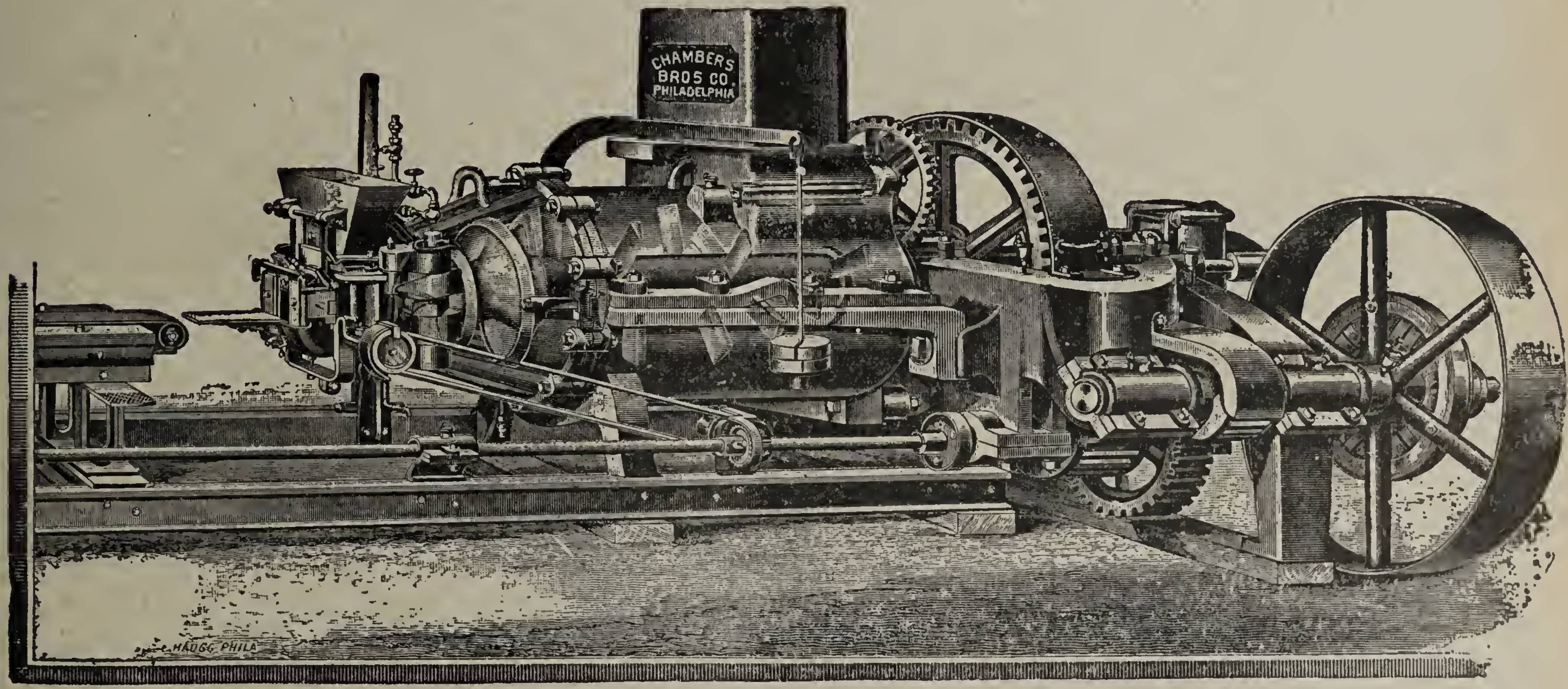
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXII, No. 5. INDIANAPOLIS, IND., NOVEMBER, 1899. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

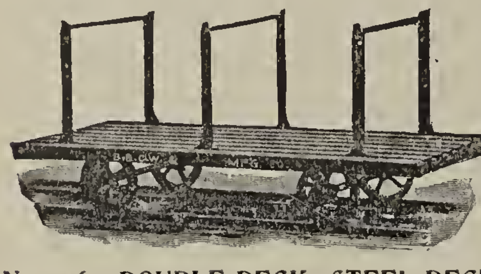
PHILADELPHIA, PA.

The Atlas Bolt & Screw Co.,
Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

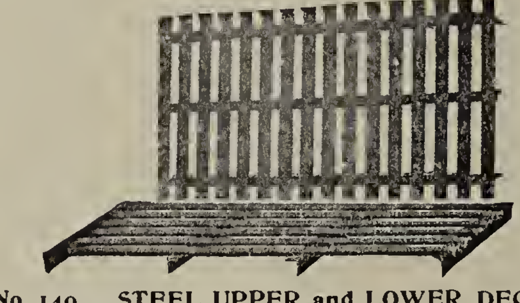
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

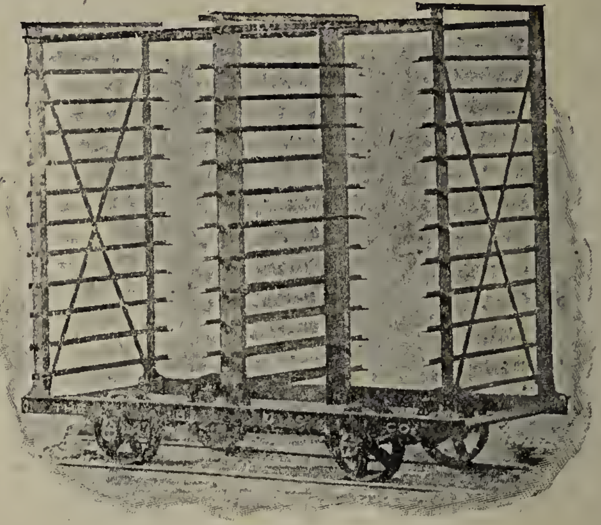
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

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WHEN WRITING TO ADVERTISERS
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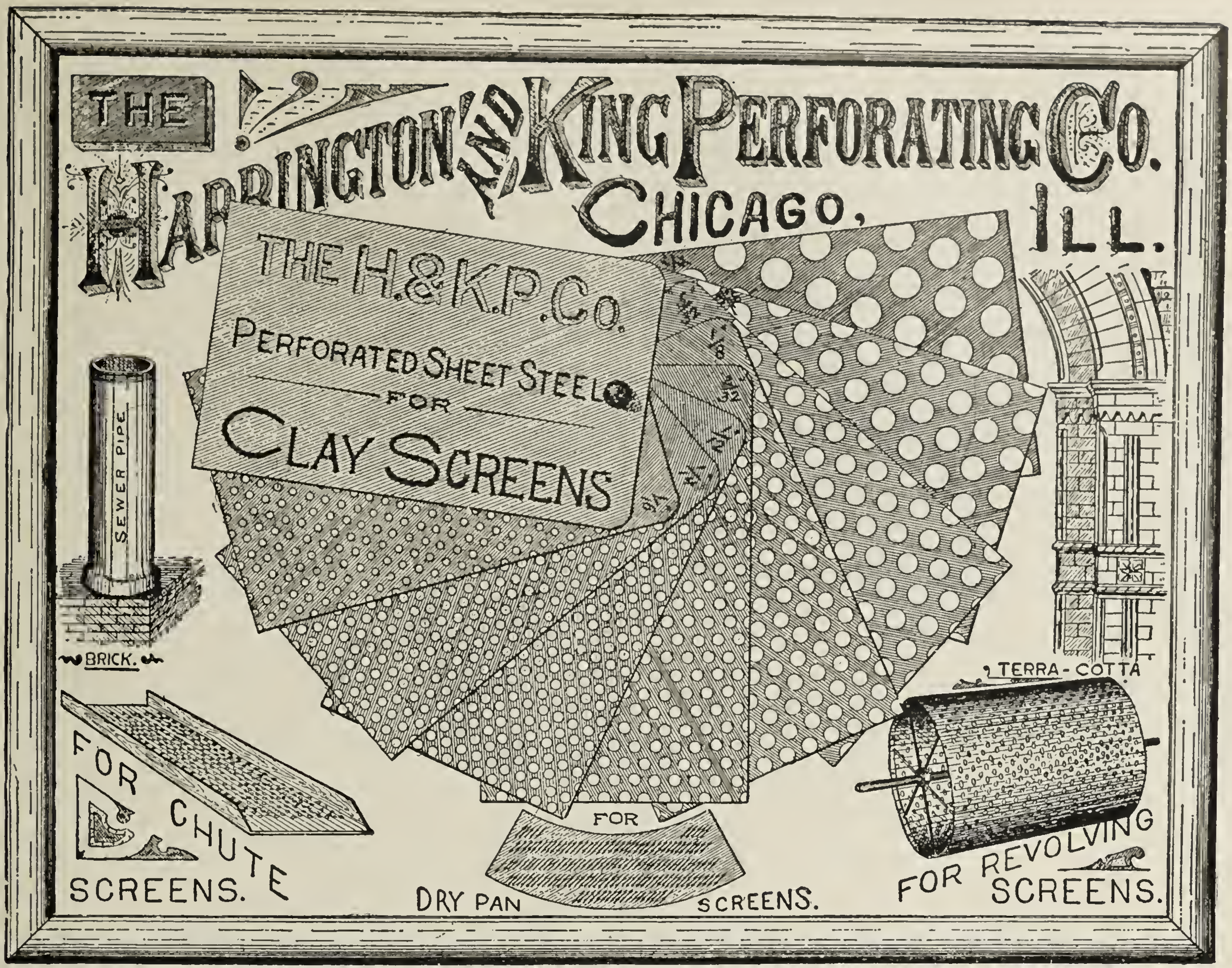

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CHICAGO, ILL.

THE H. & K. P. CO.
PERFORATED SHEET STEEL FOR CLAY SCREENS

FOR CHUTE SCREENS.
FOR DRY PAN SCREENS.
FOR REVOLVING SCREENS.

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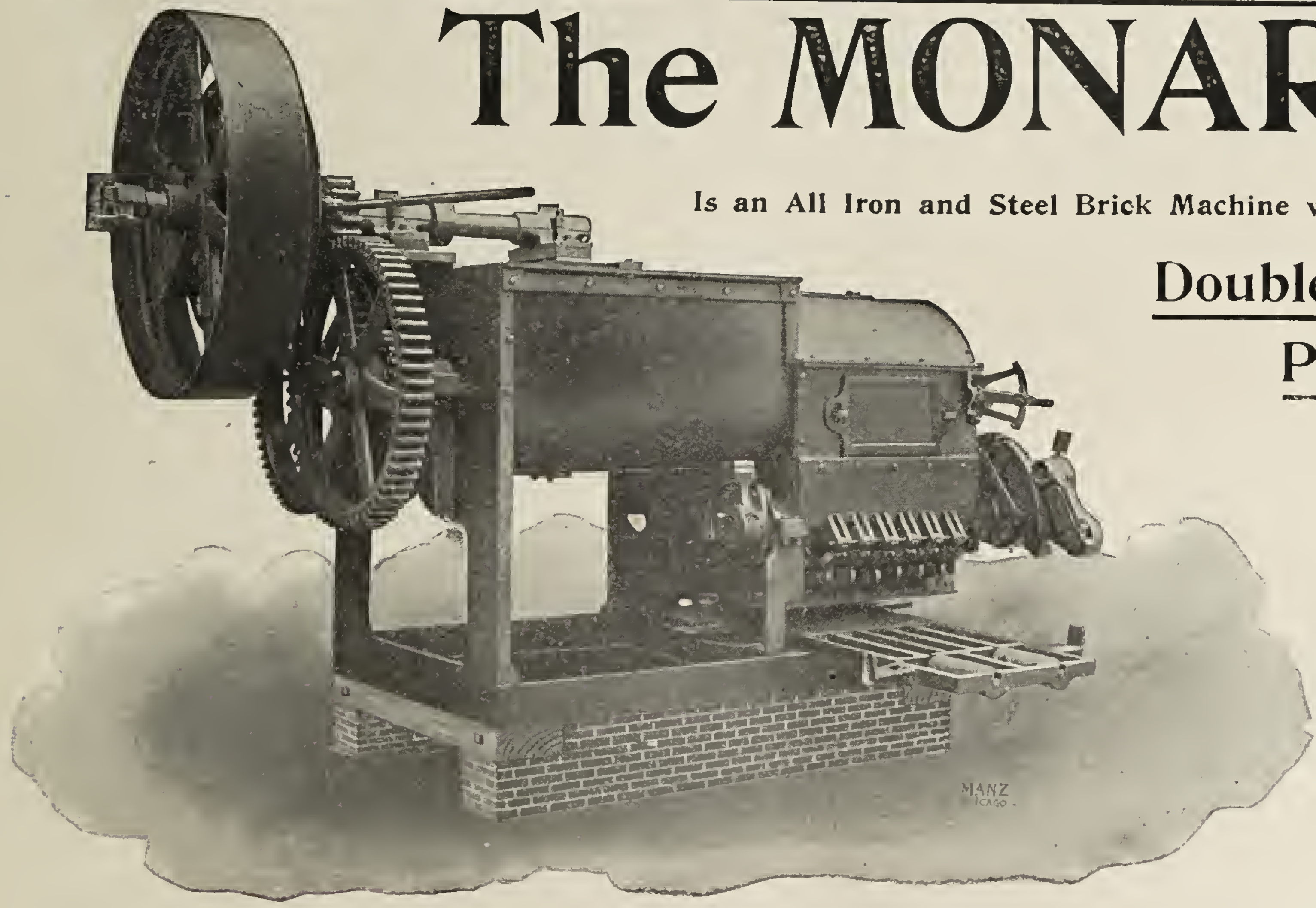
The MONARCH



Is an All Iron and Steel Brick Machine with

Double Pug Mill.

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SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

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Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for 1899 Catalogue.

JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.

America's Greatest Brick Machine

A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

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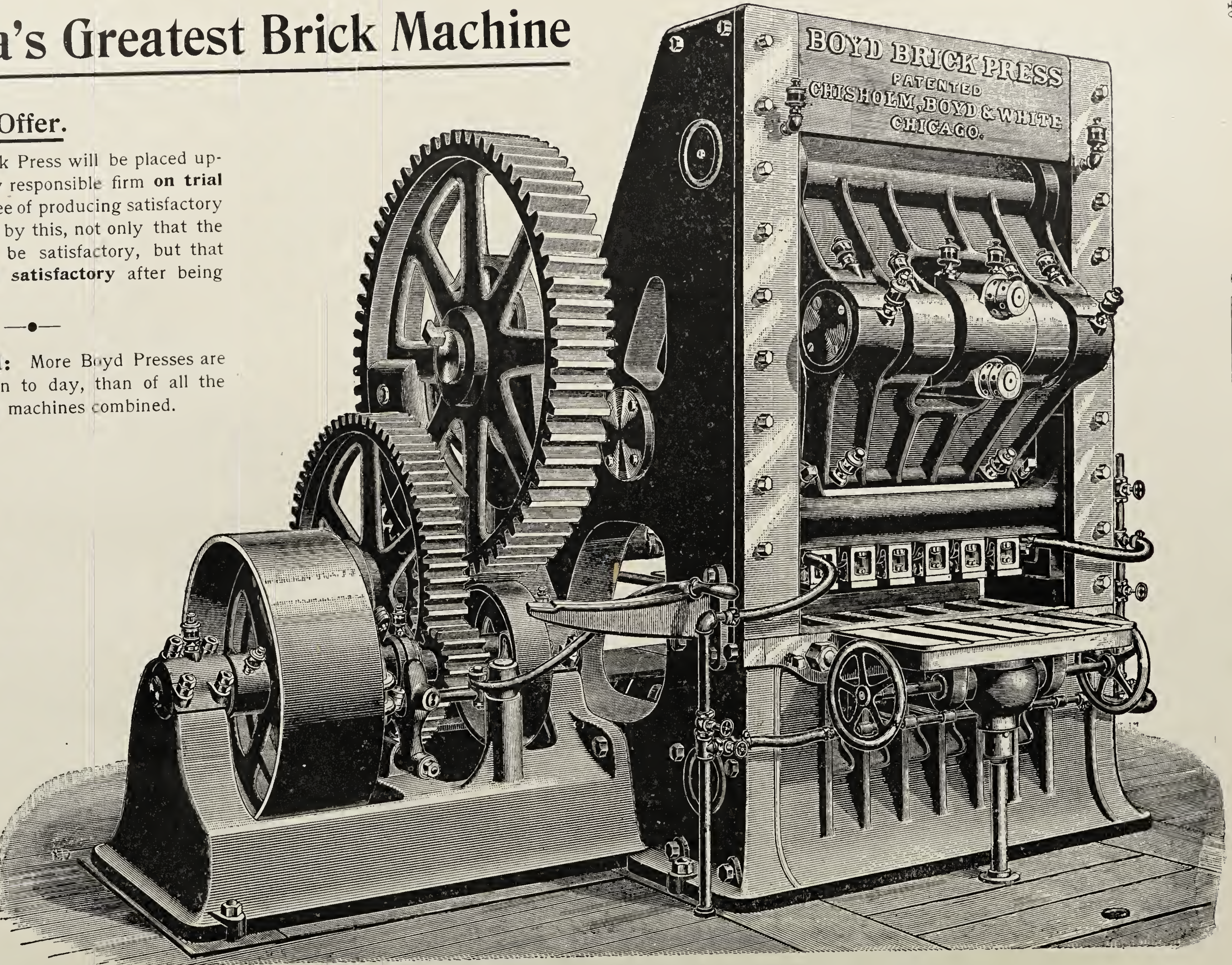
Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



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57th and Wallace Streets.

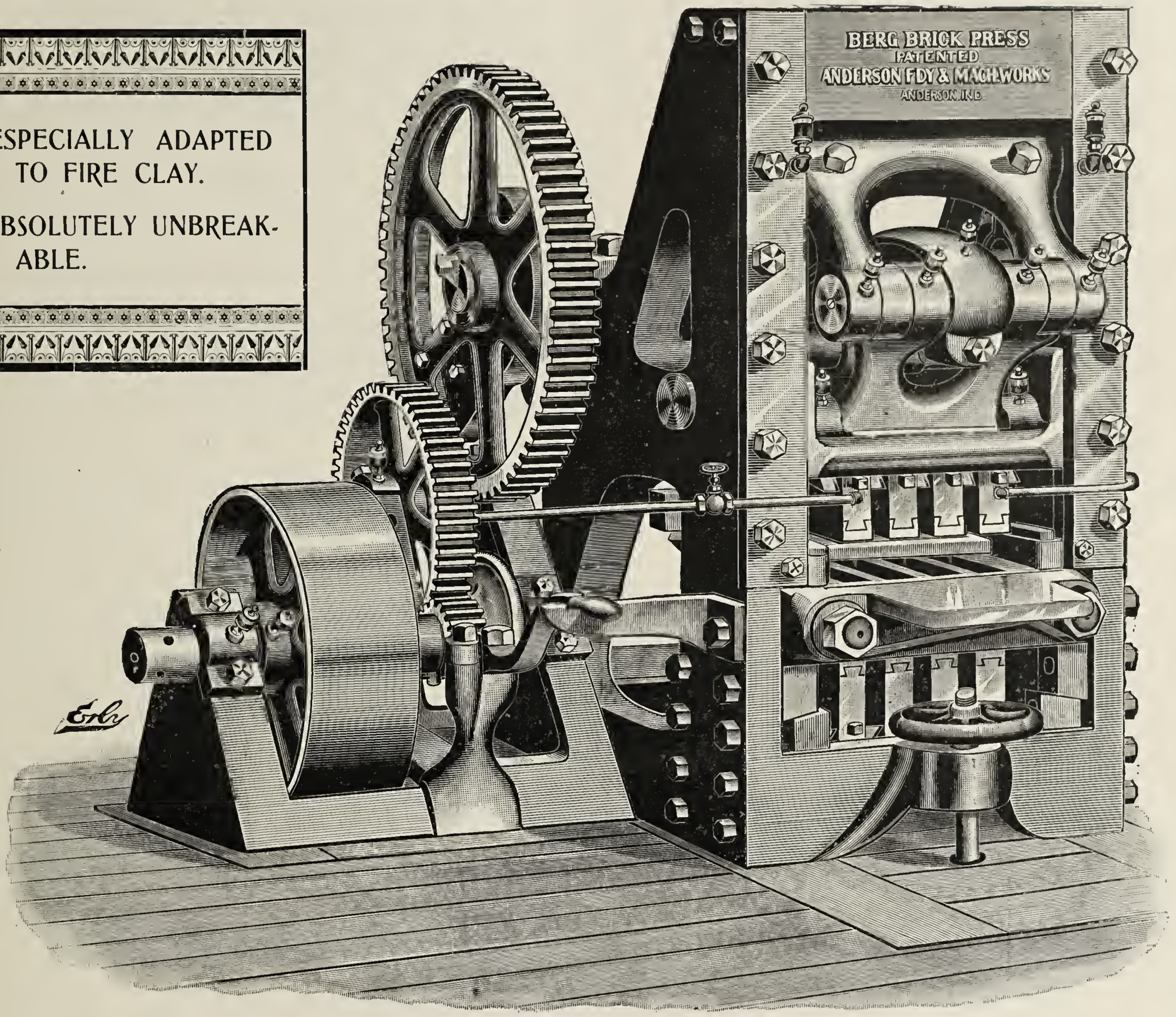
CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

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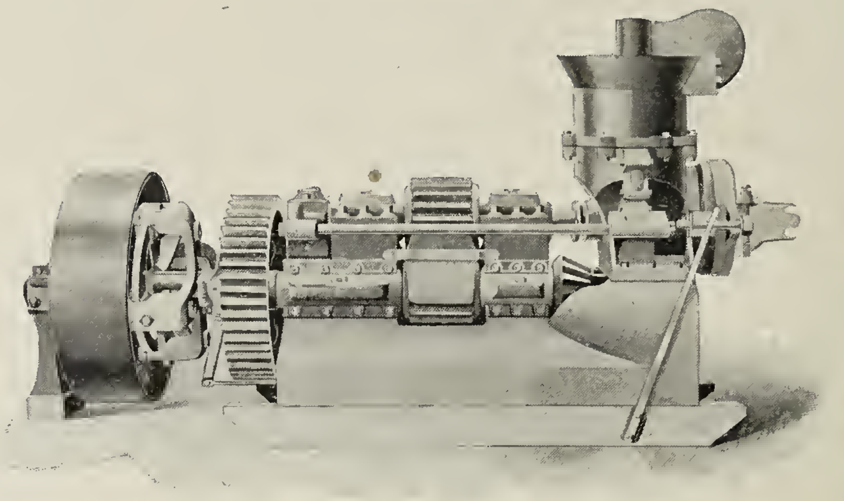
MANUFACTURED BY

The Anderson Foundry & Machine Works,
Anderson, Indiana.

END AND SIDE CUT AUTOMATIC BRICK CUTTER.



WONDER BRICK MACHINE, made in four Sizes Ranging in Capacity from 25,000 to 100,000 Brick per day of 10 Hours.

Wonder Brick Machinery

IT IS CONCEDED that the best brick paved streets are in Terre Haute, Ind. We invite you to call on the Terre Haute Brick and Pipe Co., and see the **Big Wonder** make the brick. . . .

The Wallace Mfg. Co.,

Frankfort,
Indiana.

WESTERN AGENTS:
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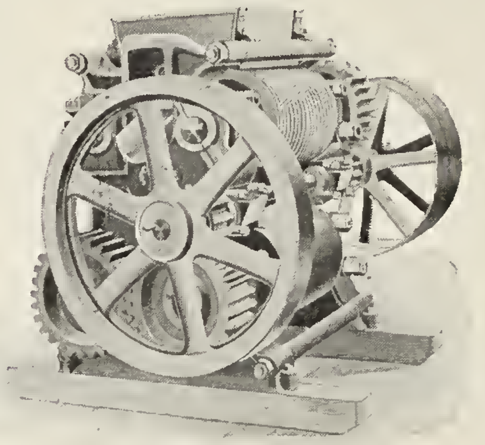
CHICAGO, ILL.



CRUSHERS AND STONE SEPARATORS, made to Suit Conditions under which they are to work.

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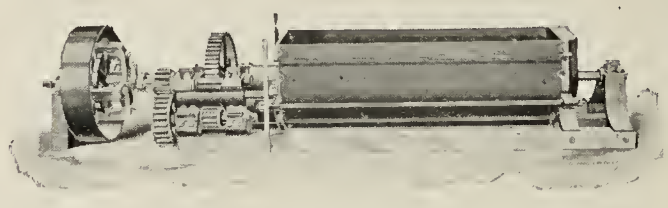

OPEN AND CLOSED TOP PUG MILLS. Capacity to suit your Requirements.

A RECORD BREAKER.

THE **Battle Ship Oregon** was not built by the oldest and largest Ship Building Works in the World, but she was a record breaker for low cost for repairs. So with the **Wonder Brick Machines** as the following letter testifies. This is the second Season this machine has been run.

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THE WALLACE MFG. CO.,
Frankfort, Ind.

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We are making 50,000 brick per day regularly on the Big Wonder. Have not started up any of our other machines this season, as the one machine fills our yard completely, which holds as you know 500,000 brick, requiring two gangs of wheelers and setters. We have never broken so much as a bolt, closed down the machine a minute for readjustment, or paid out one dollar for repairs since starting. We wish you abundant success.

Very respectfully yours,
GRAND RAPIDS CONSOLIDATED BRICK & TILING CO.

You will find seven **Wonder Brick Machines** in Grand Rapids and vicinity.

The Wallace Mfg. Co.,

CHICAGO AGENTS:
CHICAGO BRICK
MACHINERY COMPANY,
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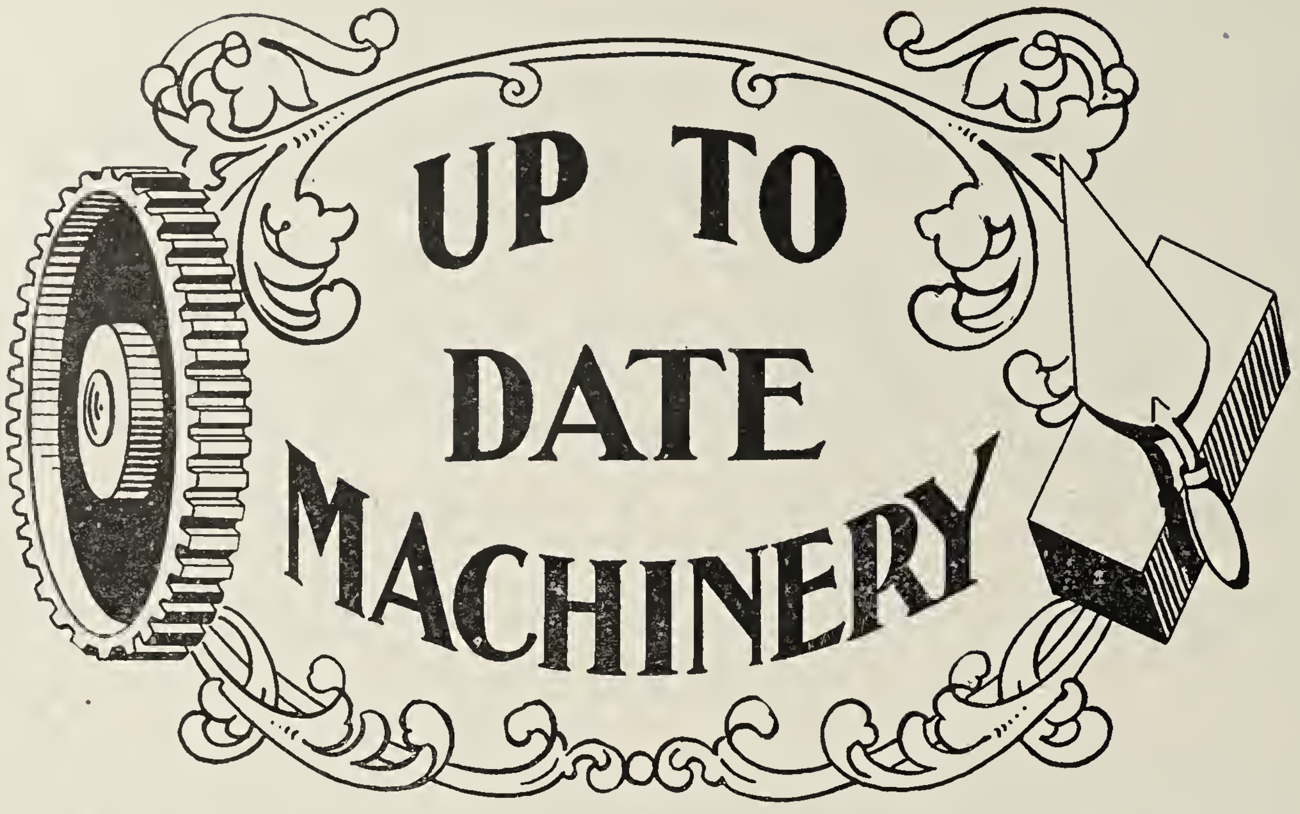
Frankfort,
Indiana.



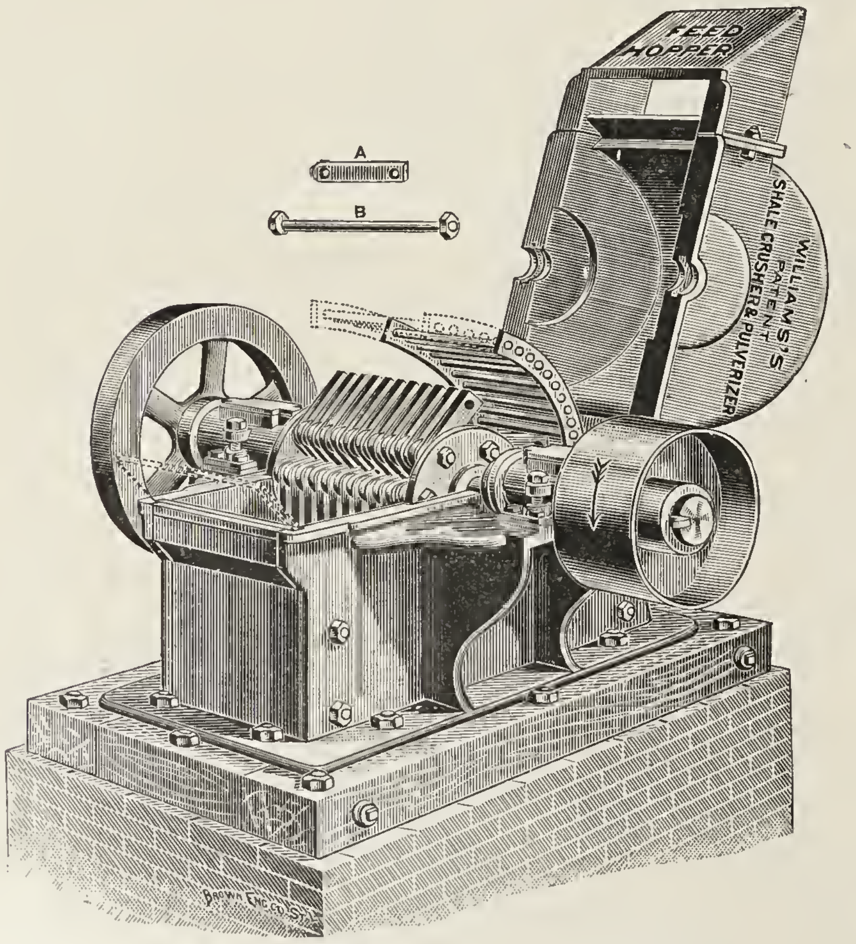
When Buying New Machinery

Why not get it strictly **UP-TO-DATE?** Machines go out of date soon enough anyway, without buying a back number to start with. All the latest conveniences and improved appliances for making Sand Moulded Brick, Wire Cut Brick, Paving Brick, Drain Tile, Fire Brick and Pressed Front and Ornamental Brick, can only be found on our machines. Chicago is a strictly Up-to-Date town, and we are right in the middle of it.

CHICAGO BRICK MACHINERY CO., 225 Dearborn Street.

The WILLIAMS PATENT CRUSHER & PULVERIZER CO.,

of St. Louis, Mo., U. S. A.


FEED HOPPER
A
B
WILLIAMS'S PATENT SHALE CRUSHER & PULVERIZER

Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

BY THE USE of one of their Up-to-date Shale Breakers, they will guarantee to double the output of any Dry Pan by using it ahead of the Pan. Or by the use of one of their Tailings Pulverizers after the Pan will guarantee also to double the output.

FOR FURTHER INFORMATION WRITE TO

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2701, 2703, 2705 and 2707 North Broadway,
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Branch Offices:
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PHILADELPHIA OFFICE: Stephen Girard Bldg.
WEST VIRGINIA OFFICE: Bramwell.
LOUISVILLE OFFICE: 1301 West Main Street.

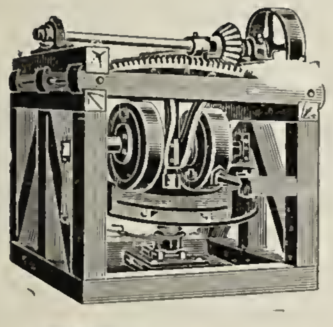
STEVENSON & CO., WELLSVILLE, OHIO, U. S. A.

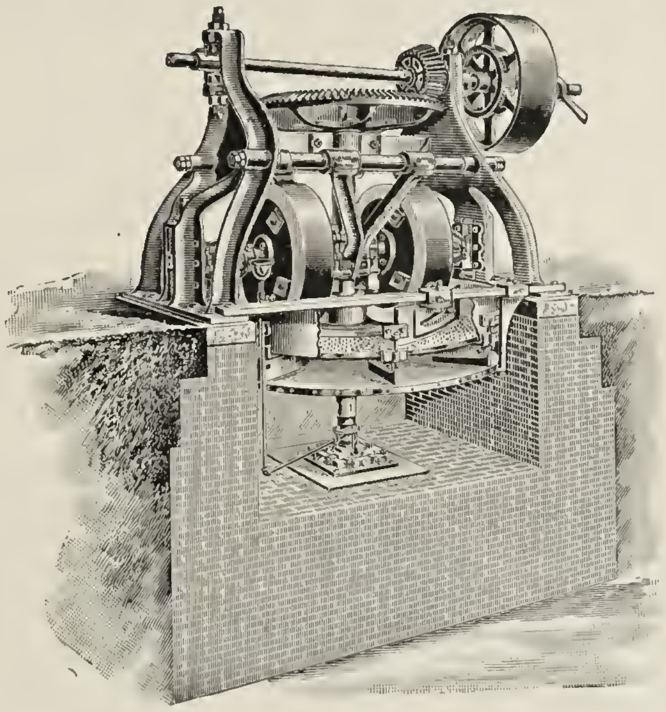
MANUFACTURERS OF

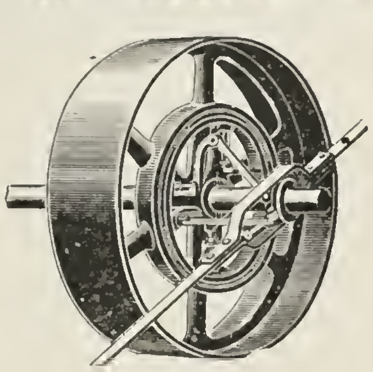
Brick Machinery.

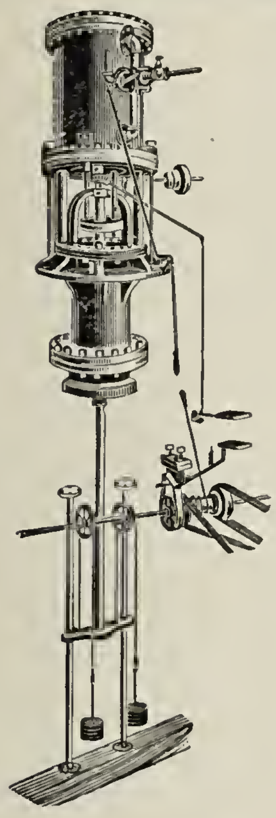
COMPLETE EQUIPMENTS.

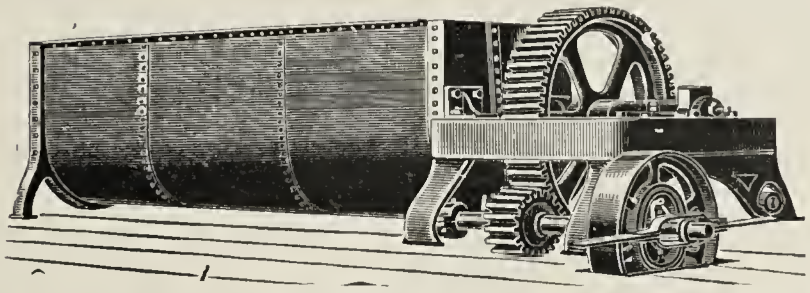
Tile Machinery

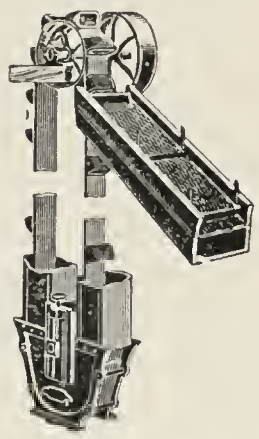












Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

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The Standard Drier

FOR BRICK AND TILE.

The STANDARD DRIER purchased from you some time ago is giving entire satisfaction. With it, we consider our plant perfect. Without it, we would be compelled to shut down at this time of the year; but as it is, we are making brick the same as during the finest Summer days. We find that with your Drier the expense of running has been reduced and the repairs are not worth mentioning.

We consider the "STANDARD" DRIER a great success.

GROMAN BROS.

South Bethlehem, Pa., Oct. 7, 1899.

EVIDENCE OF SUPERIORITY.

Hundreds of Testimonials. Ask for them.

ADDITIONAL PROOF.

What others say is What Counts. Ask for Catalog. It tells all about THE STANDARD DRIER

We are drying from 20 to 23,000 brick per day in our three track "STANDARD" DRIER; using exhaust steam in the daytime and live at night. We find that drying by your system has removed the saltpetre or whitewash from our brick entirely.

We take pleasure in recommending the "STANDARD" to anyone who desires a first-class Drier.

THE COLUMBIA BRICK CO.

Columbia, Pa , July 24, 1999.

The Standard Dry Kiln Co.,

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Written for THE CLAY-WORKER.

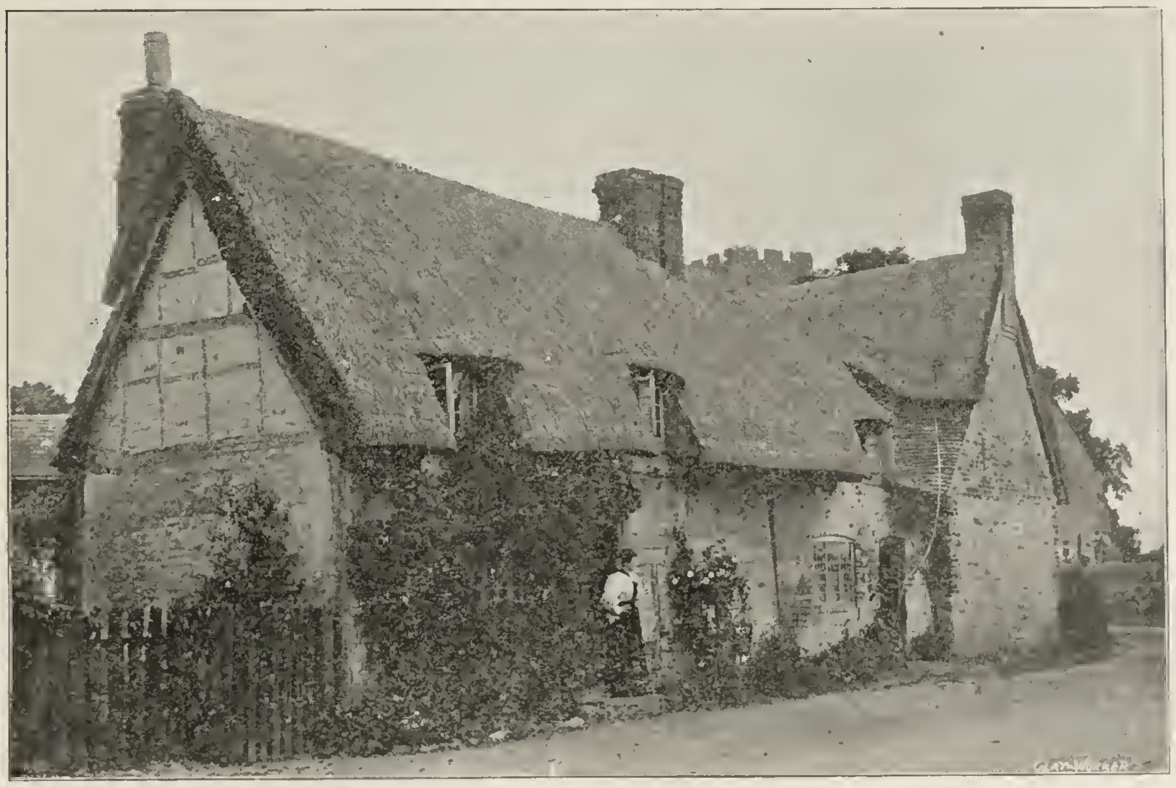
OLD ENGLISH BRICK COTTAGES.

Economy of Brick Construction—Homes of the Common People as Well as Those of the Rich built of Brick—Still in Good Condition Though Hundreds of Years Old.

> "Dear lovely bowers of innocence and ease,
> Seats of my youth, when every sport could please,
> How often have I loitered on thy green,
> Where humble happiness endeared each scene!
> How often have I paused on every charm,
> The sheltered cot, the cultivated farm,
> The never failing brook, the busy mill,
> The decent church that topt the neighboring hill,
> The hawthorne bush, with seats beneath the shade,
> For talking age, and whispering lovers made."

I THINK IT must have been while walking through the old village streets and across the old village green and thence up to "the decent church that topt the neighboring hill" that Goldsmith got the inspiration to pen those lines forever sweet, which he called "The Deserted Village." It was while standing in or near the village churchyard on the hillside, no doubt, where he could see the children on the green frolicking and playing, and the laboring swain returning from his day's labor to his humble cot, and hear the old mill wheel groaning under the little rushing stream, and perhaps hear the church bells close behind him calling the villagers to render their evening song of praise to Him who had cared for them during the day, that he penned those first lines—

> Sweet Auburn! loveliest village of the plain," etc.



AN OLD ENGLISH THATCHED COTTAGE.

This first picture is a typical scene in an English village. What a charming spot! Made more charming by the presence of the shepherd's daughter in the doorway. I think the person who has seen an English village through the photographer's art only cannot realize the poetry there is in these old village associations. There is poetry in poverty, and yet I think none so sweet as that of rustic life which finds contentment in uncomplainingly doing its daily labors and receiving its scanty pay. What England needs to-day before the rustic life, which is fast fading away, is gone is an English Burns. Enshrined around the hearthstones of these old thatched cottages is poetry which has never been expressed, except in the lives that have passed away and are fast passing.

The time will soon come when the last vestige of life once truly noble will be gone forever. The old scenes which speak of an isolated life before modern intrusions were introduced are being made to suit the conventionalities of the times. I do not know that much mourning, however, should accompany its dissolution because it is giving place to conditions and changes more conducive to comfort and health; and yet the memories will always be precious and the halo continue to brighten.

Picture No. 1, like those to follow, is taken from a moderate sized village in one of the Midland counties. Buckinghamshire is in the western part of England and is dotted, in the southern part especially, with just such villages as the one from which these views are taken.

The note I made on the cottage, published in my article in the April CLAY-WORKER on "Old Brick Buildings in England," may be made of those in this article. These cottages became necessary as the country's population increased four hundred years ago, and better living conditions were demanded. It is true they did not all come into being in one year, or in fifty, or even in a hundred years.

It is possible to trace out their history and age by a careful study of their make-up. For instance, the history of building shows that in northern climates the steep roof is always the oldest. This would be manifestly so when skilled labor and mechanics were hard to get. That roofs would be tested in winter by the weight of the snow, and in the spring by the rains. A thatched roof contains a great deal of moisture after rains.

Looking at the first picture, one notices how steep the roof is. This may be accounted for as suggested above, or by the incapability of the builder to calculate the strain the framework of the roof would stand. Furthermore, he probably did not know the varying strength of the different woods he would have to use. In the oldest houses the wood was hewn and is mostly oak, showing that the less endurable material had gone. Oak was plentiful in those days in the British Isles. From time to time, as occasion has required, new thatch has been added, making some of the roofs often a foot and a half or two feet thick. Much of the old straw is taken off when any amount of the new is required, so as to reduce the weight on the rafters. The first thatch put on a house is, of course, the most difficult and expensive. It has to be sewed with heavy twine or with willow twigs pierced through the straw and wrapped around the framework of the roof. The twine and willow twigs show in many bedrooms to-day, never having been covered with plaster. The bedrooms are plastered between the rafters as high as the ceiling. I have seen only a few full two-story thatched houses. The upstairs should be called the garret. The ceilings, as you see, are not very high—too low, often, to be healthful. A man should not be very tall if he wishes to stretch far. The downstairs ceiling is usually bare, never having been plastered; a coat of whitewash only covers it. The walls are plastered and usually papered, though that is a modern intrusion; the old custom was to whitewash the whole of the inside.

The wooden framework visible in the walls of the first picture may arouse some curiosity. Before starting to lay any bricks the frame of the house was all mortised and fitted together. The walls were then built in the frame, often only the width of the brick in thickness. Without such a framework the thin walls would never have stood more than a small portion of the time they have.

This brick nogging may suggest to what extent bricks were made, and their cost. While I have never seen a statement to that effect, and have never heard, except what the villagers themselves say, these houses supplanted the rude huts, often of mud, sometimes of turf, in which the people lived before the art of brickmaking was practiced in the rural districts.

In the part of the country from which these views are taken no stone is found, so I think the only buildings that disappeared at the advent of this better kind were the ones above mentioned. An old man, quite intelligent, too, told the writer once that tradition, which purported to be true, has it that his native village was one long street of mud huts before the brick houses were built. The principal street still bears witness to that tradition in its name, "Whole Street Lane."

The brick were very well made from clay that burns a light red color. They are not impervious to moisture, by any means. Often I think the facilities for burning were not good, and so a good many not well-hardened bricks got in. The walls being so thin, the houses are often damp in a wet winter, of which England has not a few. This, however, has been counteracted by a wash, usually limewash or whitewash. As will be seen in two of these pictures, the walls are white; that comes from this wash. This wash helps to keep out the dampness, as well as add neatness and cleanliness, which are not seen about the more modern buildings. Around some of these cottages vines are trained, often the English ivy. This beautifies the appearance, but does not help the house much. The English have a natural love for flowers, so around every cottage you see little flower beds and rose bushes. In the ordinary cottage of the kind presented here there are about four rooms and a pantry. In the first picture are three cottages. Among the English large families are considered more of an honor and comfort than among Americans, hence they have them; but living is crowded, for that reason, among the village folk.

I said in the April Clay-Worker that these houses are of the time of Queens Mary and Elizabeth. I have been unable to discover when they began to come in, but the villagers say that during that time many of the present ones were built. That makes them nearly four hundred years old—quite old for such houses. I do not know how these old houses impress one who has never seemed *in loco*, but to one who has lived and moved and had his being among them they grow dearer with acquaintance.

The row of houses in the second picture is not uniform throughout. The right end ones, which run crosswise, are apparently older, though no woodwork is seen in their walls. They were once probably stone huts, but, when bricks became common, were enlarged. Their walls are very much thicker than the others, which accounts for the absence of any woodwork. Their roofs are even more steep than those which are older, but made so in order to give more room upstairs, also because straw was cheaper than brick.

These houses stand hard on the road, but wherever there is a morsel of ground belonging to the property it is fenced in—I suppose to keep it from swimming away. But, by the by, the Britisher has ceased to throw out the anchor before going to bed, for he has great faith in the stability of his island. He does not think either the French or Boers would make much success in trying to purloin it while he sleeps. I suppose the old man in the dooryard would prosecute me if he knew I was publishing his photograph without special sanction. But since he will not live to wear out the old house, he will not be subscribing for The Clay-Worker to learn the price of bricks for a new one.

Photograph No. 3 shows a step later in the history of brick building. It has quite a modern appearance, compared with the first two. How far the building dates back I do not know. The brick in its walls are of a much finer grade than those in the others. The walls are a good thickness and solid. The bricks are of a mixed color—that is discernible in the photograph. The walls make a motley, but very good, appearance. The floors are made of brick, as are the floors of all such houses. And the same may be said of all new houses, excepting, perhaps, the room used for a sitting room. It seems strange, I know, to an American to see that brick wall so neatly made around the little strip of garden in which the occupants are standing, but every inch of land must answer some purpose and be protected from encroachment. Inside the wall will be found a very pretty and well-cared-for flower garden, containing little beds, with many varieties of flowers. Thus neatness and a native domestic atmosphere are added with little labor and at little expense.

These houses are heated from grates. In the kitchen is a cooking range, built in like a grate, and well suited for culinary purposes. It is seldom that fireplaces are found upstairs. This house, by the way, is a farmhouse. The farmer and a part of his family stand in the garden. I say "a part of his family," because if that is all he falls below the average, and that would be a strange thing for a good old Buckinghamshire farmer to do. At the back of the house is a set of farm brick buildings, quite as well built and neat looking as the house.

(To be continued.)

Humors of the Iron Market.

The people who traded their old lamps for new ones with an eccentric merchant, and were immortalized for it in the "Arabian Nights," no doubt thought themselves sharp in their day and generation; but some modern bargains beat that. Some Eastern railroad companies last year contracted for new steel rails at $17 a ton at mill; the rails have been delivered, and laid, and in one case, at least, the old rails which they replaced have been sold at $26 and $28 a ton. It is not every day—nor every year—when a railroad company can thus get a premium on a new track which pays all cost of freight and relaying and leaves a neat profit besides; but this is an actual case. It is one of the humors of the iron market.—The Engineering and Mining Journal.

Written for THE CLAY-WORKER.

A BRICK FACTORY IN A WOODEN TOWN. No. 18.

BY L. C. M.

WE WERE honored not long since with a visit from our competitor in the brick business. Of course, we were glad to see him and to show him all over the place, for this was his first visit to our factory. We had much to show him—new machinery, new kilns, and a brand new burn, of which we were especially proud. The machinery, from the engine down to the trucks, was behaving to perfection and turning out bricks at the rate of 25,000 per day. That J. D. Fate automatic side cutting table was doing particularly fine work, slicing the column of clay into such smooth, even sized bricks that repressing would mar rather than enhance their beauty. But we could not interest him in any of these things. There seemed to be a weight upon his mind, and so great a one that there was no room for ordinary matters. Soon he unbosomed himself and stated his business, with the following preamble:

All kinds of business were on a boom excepting the brick business. Building materials of all kinds excepting bricks were on the advance, and that bricks, too, were enjoying the same privilege in all towns excepting our own. Why should we lag behind the procession when, by simply saying the word, we could fix the price of our commodity and realize $1 more per thousand than we now get?

He stated that they were now getting at least $1 more per thousand than we were because their bricks were nine inches long, whereas ours were only eight inches, and intimated that theirs were also preferable from the standpoint of quality. While he claimed that their trade was quite satisfactory, still his customers used our prices as a lever to force them down a notch on theirs. He thought an understanding between us on the quiet would be very desirable and of great advantage to both concerns. He had his say and then we had ours.

Theoretically, I am opposed to trusts; but on the quiet I do not object to confessing to you that I think a trust or combine is a good thing—if I have it in my own hands. If the other man owns it, then that is a gray horse of another color. The advantages of a combine such as you suggest are much to be desired at present, and I could have no objections to enjoying them were there no drawbacks, no chances for that little scheme to rebound upon the schemers to their own undoing. The first objection to your scheme is that, should we raise the price of bricks to the figures you name, then our neighboring factories at K. and C. would find this a profitable market, and ship bricks here, and we would be obliged to cut prices to drive them from the market. Your scheme would have to be broadened and take in all the factories on our lines of railroad that are not too distant to give us trouble. You would find it a difficult task to make your combination reach far enough to cover all the territory in which we find a market. There are manufacturers anxious to invade our territory, and the railroads would encourage them to do so by giving them low rates of freight. Our present prices draw customers from a great distance, and we cannot afford to lose them, which we would do if we followed your advice on raising prices. Much as I desire better profits, I cannot afford to disturb the trade which I have built up by so many years of labor and care. But, my friend, have you never attempted to find some other plan than consolidation or combination by which you can make the balance come upon the right side of the ledger? You have told me what it costs you per thousand to make bricks. Your figures seem to me very high, but I am satisfied you have told me the truth as nearly as you can figure it out. But did you never try to cut down your expenses, stop some of the leaks and thus reduce the cost of production? Let us take the various steps in your *modus operandi* and see if a plain talk upon the various phases of your work will not show you the need of a more economical management.

Your yard is a small one, not making over one-half million per season. On such a small yard as this there is no room for an idle man with store clothes—one who calls himself manager, bookkeeper or some name other than workman. Every man in such a small concern should take off his coat and labor as hard as if he were working for wages, for good wages is all one should expect from a business of such dimensions. Too often it turns out that the men get the wages and the proprietor gets the glory. This, it seems to me, is error No. 1.

You use the same methods of manufacture that were used at the building of the Tower of Babel. Now, I am not so sure that you can afford to throw away your crude appliances and install a costly plant. In fact, I am sure such a plan would prove your ruin. Too many have gone over that rugged path and stumbled into the pit of bankruptcy. But see if some improvements cannot be made in your outfit that will lessen the cost of production by stopping the ruinous waste, which you confess reaches 15 per cent., and which I am convinced is even higher than that. Last spring was a very rainy one, and you placed thousands of bricks upon your open yard that had to be carted back and ground anew or thrown into the waste heap. There was one month in which you lost the output of three weeks in succession. You were thus thrown back with your work to such an extent that it was the 1st of August ere you had a brick to sell. Builders were afraid to contract with you because they saw that you would not be able to deliver in time for their work. As a consequence all of the good contracts fell to me, without your being able to compete in any way. For several months I had a corner on the contracting business. The clouds and I went into a combine to keep you out of our market. Even the small purchasers grew tired of driving out to your yard in search of bricks. I would not advise you to quit your open yard, but, in addition to that, put up sheds in which to dry a portion of your bricks, so that you may not be wholly at the mercy of the elements. The sheds will not cost you much, and you have plenty of room for them. This is error No. 2.

Group of Thatched Roofed Brick Cottages Probably 400 Years Old.

(To be continued.)

Written for The Clay-Worker.

MODERN AMERICAN FRONT BRICK. No. 22.

TESTING OF PLASTICITY.

ALTHOUGH we possess no definite knowledge in regard to the cause of plasticity of clays, it has been found by observation that the following facts are connected with the phenomenon:

First—The more plastic a clay the more it assumes a characteristic greasy "feel," which furnishes to the practical man a crude yet often sufficient test.

Second—In the great majority of clays the greater the plasticity the more water is required in working them, although there are exceptions to this rule.

Third—It is a generally known fact, observed in connection with auger machines, that plastic clays can be forced through a die in greater lengths than it is possible to do with lean ones. Hence we might say that the plasticity of a clay is directly proportional to the length of, say, a cylinder of the clay forced through a die.

Fourth—It has been found by a great number of experiments that clay, when dry, has a tensile strength in proportion to its contents of plastic clay substance, or, in other words, in proportion to its plasticity.

Fifth—It has been shown that the plasticity of a clay increases with the fineness of its particles, and also that the mineral character is of great importance in this respect, since particles of quartz must have a different effect than particles of mica.

Old English Brick Cottages. View 3. Page 348.

From these facts we ought to arrive at tests which should give us more or less information. But since, in all modern research, it is invariably sought to arrive at definite tests whose results cannot be questioned, and which give us definite data, expressed as numerical values, we can never rest contented until such a test of plasticity has been worked out. Let us now trace the relation between the above facts and the tests derived from them.

All of us are acquainted with the time-honored feel test. All of us have worked clay between the fingers, have looked solemn and pronounced it plastic or otherwise. And, after all, it is not a bad test, although it is liable to deceive one. To one equipped with a reasonable share of practical experience it forms a pretty fair test.

The amount of water necessary to render a clay workable may or may not form a test of comparison; in most cases it does, and it may be reasoned quite properly that if, of two clays, one requires 15 and the other 25 per cent., by weight, of water, the latter is more plastic than the former in, roughly, about the proportion of their water contents, provided that this conclusion is verified by the feel test. It has been found that the amount of water is determined largely by the fineness of grain, and a clay containing a large amount of immensely fine sand might require more water than a plastic clay of coarser grain. The water test is, of course, very easily carried out by weighing a quantity of dry clay and weighing the water used in making it plastic, or by taking a piece of clay in the plastic condition, weighing, drying and finally reweighing it, the loss in weight being equal to the weight of water contained in the clay. By calculating the weight of the water in terms of the percentage of dry clay a numerical value related to the degree of plasticity might be obtained. We say might, since this does not hold true of all clays, the kaolins and similar clays being especially liable to give rise to errors in this respect.

In regard to testing plasticity by observing the length of a cylinder of clay forced through a die, it seems that this should be a very satisfactory test if the comparison of clays could always be made under exactly the same conditions; that is, the clays should be of exactly the same consistency, the volume of clay should be the same in each case, as well as the pressure applied and the rate of pressing. That this is not a very easy thing to do is evident, and hence such a test would require accurate and time-consuming work in order to be acceptable.

Of more value than the preceding test is the one derived from the experimental fact that the tensile strength—that is, the measure of the load required to pull a piece of dry clay in two—is a measure of plasticity. The writer has in mind a series of experiments which were made in order to determine the truth of this, and, with the exception of a ball clay, all the clays tested were reasonably consistent with the above fact. The test is best made by using the apparatus applied in the testing of cements, consisting of a set of brass molds making briquettes in the well-known shape of the cement test pieces, resembling the number 8 in outline, and a testing machine. The latter, in the main, consists of two metal jaws, which engage the two halves of the briquette, and, by a gradual increase in pulling power, finally break it. The load is applied either by means of a weight sliding on a graduated lever, from which the load expressed in pounds can be read, or by means of a bucket, which is slowly filled with water or shot till the test piece breaks, when the supply is shut off automatically. The weight of the bucket, plus load, multiplied by a number depending upon the length of the lever from which the pail is suspended, will give the total load applied. The space between the dry briquettes and the jaws of the machine must be filled up by means of strips of pasteboard. Each briquette must be measured accurately around the place of rupture—that is, the middle of the test piece—so that the strength can be expressed in terms of the square inch. Testing machines for tensile strength can be bought quite cheaply from various firms, such as the Fairbanks Scale Company. Care must be taken, however, to see that the machine has its lines of pressure strictly parallel to the axis of the briquette, or else side strains will occur, which vitiate the result. In making the briquettes the clay is to be molded carefully in the standard brass molds, and the drying must be done very slowly, so that no drying strains and subsequent fractures or cracks are produced.

According to Professor Wheeler (Vol. XI, Missouri Geological Survey, page 111), kaolins possess an average tensile strength of twenty pounds per square inch, fire clay and potter's clay 150 pounds, red loers brick clays 150 and gumbo clays 340 pounds. Shales and clays showing a strength of fifty pounds or less are very lean; a strength of from fifty to one hundred pounds indicates a lean clay; one from one hundred to two hundred pounds a plastic clay, and one over two hundred pounds very great plasticity.

From what has been said in a previous article, it appears reasonable that a good idea of the plasticity of a clay can be obtained from the mechanical analysis, and hence its results would give a satisfactory test of plasticity by furnishing a numerical value of the clay substance or extremely fine particles present. But since, as yet, mechanical analysis is a laborious process, not to be performed by the untrained hand, it cannot be considered a convenient test. However, where it is possible to apply it, it furnishes conclusive evidence, and it is a pity that its use is so restricted. The following mechanical analyses show how strikingly the difference between plastic and lean clays is brought out:

	Plastic.	Lean.	Medium Plastic.
Coarse sand	.58 per cent.	.34 per cent.	1.50 per cent.
Fine sand	3.00 per cent.	28.46 per cent.	8.80 per cent.
Silt	3.52 per cent.	13.84 per cent.	10.90 per cent.
Rock dust	11.16 per cent.	20.24 per cent.	12.88 per cent.
Clay substance ..	82.18 per cent.	37.00 per cent.	65.88 per cent.

These figures have been taken from Zwick's "The Nature of Brick Clays."

Now, out of the tests considered, which can be applied most readily? Evidently the "feel" test, the determination of the water contents and that of the tensile strength are the ones to be selected. By combining the three tests a fairly accurate value of plasticity can be obtained. In addition, there is a sieve analysis; that is, the washing of the clay through a set of sieves, from 150-mesh down, should be carried on.

BONDING POWER.

Intimately connected with plasticity is the bonding power of clays. By this term we mean the ability of the clay to hold nonplastic matter without being impaired in its working quality. We should naturally expect a lean clay to possess a numerically lower bonding power than a fat one, since, as a rule, the latter is supposed to contain itself but little nonplastic matter, and hence can be diluted until the limit defined by its working quality has been reached, while the lean clay is already diluted to an extent approaching the limit. The application of this simple process of reasoning is self-evident, for we add sand or grog to clays having a high bonding power and add plastic clay to lean materials deficient in bonding power. In the pottery industry we have a good illustration of different bonding powers. Some pottery bodies are composed of kaolin, quartz, feldspar, whiting and ball clay. Kaolin is a clay of low bonding power, but produces the white color required; feldspar and whiting are required to make the mixture less refractory, in order to produce vitrification; quartz is desired in order to furnish silica for the lime and to hold up the body to the proper strength. The last three materials, feldspar, whiting and quartz, or flint, are strictly nonplastic, and hence by adding them to the kaolin, already low in bonding power, a mixture would result which could not be worked on the wheel. In order to overcome this defect ball clay, which is high in bonding power, is brought in, although, owing to its contents of iron, it introduces a tendency to discoloration.

Hence it is quite desirable to know the bonding power of a clay; that is, to know how much nonplastic matter it can stand. This is best ascertained by using the same apparatus applied in the test for plasticity, but proceeding differently in the making of the briquettes. In place of the unmixed clay, thorough mixtures of the clay and varying proportions of a well-selected sharp sand are used. For instance, we could start with ninety-five parts of clay and five of sand, increasing the sand up to the limit set by the working quality. In this way the bonding power, as well as the degree of plasticity at the proper working quality, can be determined. Of course, the same practical result can be had by simply making a number of mixtures of clay and the nonplastic material intended to be used, and trying the various mixtures for working quality.

SHRINKAGE.

What is the cause of shrinkage? Without accepting either the spheroid or the plate theory, we know it to be a fact that between the particles, whatever may be their shape, there is a more or less thin film of water, so that when the water is evaporated the particles touch and no more shrinkage takes place. This is amply proven by the fact that the cubical shrinkage is equal to the volume of the water evaporated during the shrinkage. For instance, if from a plastic mass of clay ten cubic inches of water have been evaporated during shrinking the cubical shrinkage is also equal to ten cubic inches. This is true up to the point when the particles touch each other, and no more shrinkage can take place. But all the water has not been evaporated at this stage, for whatever be the shape of the particles they cannot touch each other all around, except their outlines be bounded by straight lines, which we cannot conceive to be the case, and hence there are spaces or pores left between the particles which are yet filled with water. We are, therefore, justified in saying that clays contain two kinds of mechanical water, that which is between the particles, keeping them from touching, which is called shrinkage water, and that which fills the pores, after shrinkage has ceased, pore water. But since the particles of clay substance are extremely small, and since the capillary tubes or channels between them are necessarily also very fine, the water on drying must follow their tortuous paths. This explains why so many clays dry difficultly, and why warping and cracking results if the water does not escape uniformly or is expelled too rapidly. Strains evidently are produced by the unequal escape of the water, by particles approaching each other at one place while still separated by a film of water at another, and these strains give rise to checks and cracks.

How do we explain the effect of sand or other nonplastic material upon clays?

Before we can try to answer this question let us keep clearly in mind the actual results obtained by adding nonplastic materials, say sand to clay. The result depends largely upon the degree of fineness of the sand, and the quantity in which it is added since these determine whether the sand is to displace pore water or only shrinkage water or both. Extremely fine sand on being added to a clay up to a certain quantity may, to a large extent, displace only pore water, and the result will be increased shrinkage. This may sound quite heretical to some of our practical fellow-clayworkers, for is it not generally accepted as a fact that sand always and invariably reduces shrinkage? When, however, the sand is not of such a high degree of fineness, or is added in large quantities, then shrinkage water is displaced and shrinkage is reduced, for we must keep in mind that the shrinkage is always equal to the volume of the shrinkage water, so that for a large volume of shrinkage water evaporated the shrinkage is also large.

Old English Brick Cottage. View 4. Probably 200 years old. Page 348

Perhaps an example will make the above clearer. If 100 volumes of pure dry clay are mixed with 25 of water to a plastic consistency, and these 125 volumes of clay mass are dried till all the shrinkage water has been evaporated, leaving five volumes of water as pore water, the volume of the mass will be equal to 125, minus 20 volumes of shrinkage water, or 105 volumes. Upon complete drying the pore water will escape also, but the volume of the clay mass will remain 105 volumes, of which five are now pores. Again, let us imagine a mixture of 100 volumes of clay and very fine sand mixed with 25 volumes of water, the fine particles of sand filling up the pores between the clay particles. Since in this case no pore water can occupy the spaces already filled up by the fine sand, the 25 volumes of water will behave like shrinkage water, and the decrease in volume will be equal to the 25 volumes of shrinkage water, so that on complete drying there will be left 125, minus 25 volumes, or 100 volumes of dry clay. In this case the shrinkage has been greater than in the first, notwithstanding the addition of sand. Of course this is a theoretical case, since if there are no pores left maximum density would result, and this is an impossibility, but it serves to show the principle which actually underlies the addition of sand.

If the sand is added in larger quantities, or is of a coarser grain, it will displace shrinkage water, and thus reduce shrinkage, and this is usually the case.

In order to obtain a clear picture of the function of sand we must imagine the grains of sand surrounded by an envelope of clay particles. The more sand there is present the thinner will be this envelope of clay, and finally there will not be enough clay left to surround the grains of sand. When this state has been reached the clay does not cohere sufficiently to form a bond, and hence has lost its working quality. Sharp grains of sand, with jagged edges, are covered with clay more difficultly, and hence sharp sand reduces shrinkage more readily than well worn grains.

In regard to the influence of the size of grains added to a clay, it has been found that the larger the grain the smaller will be the shrinkage. If nonplastic matter is added to a clay in the shape of grog the conditions are somewhat different, since grog, unlike sand, is able to absorb water from the clay, and hence reduces the contents of water present more readily. Assuming equal volumes of dry sand and grog of the same grain, it will be found that the grog will reduce shrinkage more than sand.

—Measuring Shrinkage.—

We must keep in mind that the true measure of shrinkage is the cubical decrease in volume, but for many practical purposes the determination of linear shrinkage is sufficient. The measuring of linear shrinkage is a very simple matter which any one knows how to execute, and which depends upon individual precision for accuracy. One way is to mark off a fine line on a green test piece, determining its exact length to, say, the fiftieth of an inch by means of a good scale and a reading glass, and repeating the measurement after drying, or the distance between two edges of a test piece may be measured and the shrinkage thus determined.

The determination of the volume of a piece of clay can be accomplished either by measurement and calculation of the volume, or directly by saturating the test piece with heavy petroleum, or coating it with a thin coating of paraffine and measuring the volume of liquid displaced. This can be done readily in a volume meter, which can be bought cheaply from any dealer in scientific instruments. This apparatus is also very useful in determining the porosity of a clay, under which head we shall have occasion to refer to it again.

AMERICUS.

AMERICAN IMPORTS AND EXPORTS OF BRICK AND CLAY.

THE FOLLOWING exports and imports of brick and clay are just completed for the month of September, the latest period for which the official figures have been compiled by the Treasury Department:

Building brick were exported in September to the amount of 337,000, valued at $3,541, against 337 thousand, valued at $2,570, exported in the same month of 1898. During the nine months' period ending with September, 1899, the exports amounted to 6,048,000, valued at $47,091, as compared with $19,399, the value of 2,666,000 brick exported in a like period of 1898.

Fire brick was exported to the value of $20,550 in September, 1899, against $18,954 worth exported in September, 1898. The total exports for the nine months of 1899 were valued at $154,444, as compared with $113,570 worth exported during the same period of last year.

The dutiable imports of clay for the month of September, 1899, amounted to 8,339 tons, valued at $54,275, as against 6,548 tons imported in September, 1898, valued at $44,660. The nine months' total imports amounted to 89,514 tons, valued at $597,062, as compared with 80,535 tons imported during the same period of 1898, valued at $556,970.

The dutiable re-exports of clay amounted, in September a year ago, to two tons, valued at $20, there being no re-exports of clay this September.

Written for The Clay-Worker.

BUTTON-HOLE TALKS.

AS I WALKED slowly down the aisle of the crowded car I was surprised to see a big fat man clutch his bundles out of the seat beside him, and bundle them up in his lap, to make room for me in the seat beside him. His doing this amazed me, as I have said, for a casual glance had led me to think him a seat hog, and one who would not discommode himself under any circumstances. I could not but feel flattered that he had detected something in me that was attractive to him; that he wanted me near him. I had long felt that there was a subtle something about me that showed worth and dignity, and here was the proof. Wedging myself down in the little that was left of the seat, I turned toward him, or rather turned so much of myself as was movable, after the wedging process, and thanked him heartily for his kindness. At this he at first just grunted, and then looked disgustedly in my direction and growled out: "Oh, that's all right. I saw I had to take some one in, and you were the thinnest fellow in sight. Knew that if I didn't get you in quick that big fat fellow behind you would insist on coming in, and he'd be just glad to crowd me way up in the corner.

"This State fair business just more than fills up the trains. Fellow could just have a jolly study of human nature if he didn't have to have folks crowd into his seat and occupy the room he needs himself. See that little old dried-up woman that just got on at that little station? She was the belle of the township not many years ago, but her romance is pretty well hidden and forgotten. She has been up since 4 o'clock this morning, cooking bacon and coffee for her flock and getting ready for this trip. She has dressed the little children, spanked the middle-sized ones, and been snubbed and sassed by the oldest daughter, and is now on her way for an outing that is the one big day of the year for her. She is going to see the big pumpkins and eat gingerbread. She hasn't quite so much of a flower garden on her hat as the big fat woman over there sitting on that meek little man, but she has quite a few. In fact, she has all she could get.

"Talking about flowers on bonnets, just look down that aisle and take in the floral display. Whole beds of flowers on each hat. Never could see why these State fairs don't have committees on floral hat displays and make awards. They certainly would have abundant material for inspection, and a variety and arrangement that would keep them busy and tax their powers of comparison and judgment.

"See that sassy looking woman over there? Her husband's deaf, and she's been trying to talk to him through that flexible tube. They left their boy at home. Wouldn't let him come. Had an awful time with him. He got hold of that tube and plugged it up for revenge, and the old man is now frightened to death for fear he's losing what little hearing he did have, and his wife's flustered and mad because she has to shout into the thing.

"Way down at the end of the car that sleepy looking man and worn-out woman have just put up two tickets which pass the two of them and their seven small children. Children go free, you know, because they are no bother. These have stuck molasses candy over everybody in that end of the car already, and drank the water tank dry.

"Oh, there's lots of fun watching human nature on the train. Folks are very funny specimens. All different, though. Some skittish, some sad, some sick, some well, some good, some bad, some wise—yes, there are a lot of wise ones, but there are just acres and acres of fools. After all, it's a good thing the fools are here. It would be awfully lonesome without them. If the fools were all dead, you know, you and I wouldn't be here."

GATES.

PHILADELPHIA BRICKYARDS.

Present Methods Compared with Those of By-Gone Days.

ALONG THE LINE the words are: "Well, we've had a pretty good season," and this is justified by the permits issued from the Bureau of Building Inspectors, a conservative department, that, no matter what faults it may have on the outside, has a redeeming virtue by speaking the truth inside.

Some little time ago the owner of a small hand yard ventured to say he "didn't think the small man had any show." In a general sense I agreed with him, but, singling out an instance, I showed him where he was wrong. Coming back again, however, in a dogged, persistent manner, he answered: "Why, even the papers don't give us any show." Here I planted one: "THE CLAY-WORKER gives every one a fair show, and I make no distinction between the big machine yard that's turning out a hundred thousand daily and the hand yard that's hustling out ten or twelve thousand daily."

Immediately his facial lines softened, the hard aggressiveness of his tone disappeared, and he immediately became more human, and stood a malleable piece of God's humanity, ready to listen, and became convinced that the world, like the mountain, was hard and flinty externally, but beneath that rough exterior, fixed and stationary for all time, were the good things that answered to the demands and requirements of men. As we parted he shook hands and left his instructions in a kindly voice: "Don't forget to keep on sending me THE CLAY-WORKER.

This prompted me to start out the other morning, when the wind howled and everything was waterlogged after a three days' rain. The first to claim my attention was the old and partly dismantled yard of the late and well-respected James Dingee. Since his death practically nothing has been done there. An unfed man and an unfed brick machine are analogous: they soon fall to pieces. This was an all-important center, a short time since, where 250,000 could, at a pinch, be turned out in one day. To-day it is dead and silent.

W. F. ALBRECHT'S PLANT,

Located at Thirty-first street and Lehigh avenue, I found being hemmed in like the British at Ladysmith. East and west of him the small two-story houses have left him a dividing line of about thirty feet, and on the south side and within fifteen feet of the kilns he has started an operation of twenty two and three-story houses. This will take a half million bricks right out of his own yard. Scarcely an acre is thus left to him to work his pug mill and maintain the four up-draft ten-arch kilns, and a Chambers machine, which he runs up to its 25,000 daily capacity. This formerly took in about five

PHILADELPHIA BRICKYARDS—1. Peter Byrne and Son Frank. 2. A Row of Residences going up Near the Kilns of W. F. Albrecht. 3. The Kiln Sheds. 4. The Alternating Tempering Wheel and Pit.

acres and was a well-laid-out yard, where the bricks were run on tracks from the kilns and dried by hot air, and eighty to one hundred men were kept hustling. The force is now reduced to fifty, but during the past season Albrecht managed to burn nearly six million. But the coming of spring means the closing up of this yard, and he will fall back on his model yard at Langhorne, Pa., where, during the past six years, he kept four hand gangs going, turning out the usual complements. Being of a progressive type, he controls and places his own stone, sand and brick not otherwise disposed of. On my road down I passed the trim little yard of Benjamin Bertolet & Sons, at Twenty-ninth street and Lehigh avenue. The hackers were working blithely, and whistling "He certainly was good to me." Mr. Bertolet's office chair being empty, I passed, and later found myself face to face with the sign,

PETER BYRNE & SON, BRICK MANUFACTURERS, TWENTIETH AND CAMBRIA.

I knew that, as a veteran brickmaker, with his knowledge topographical, coupled with a practical experience of forty years, I was in for a pleasant chat and a few reminiscences of the past. And so it proved.

Mr. Byrne started in soon after the war, at Twenty-fifth and Diamond streets, now entirely covered with substantial residences, and held by a very conservative class of Quaker City folks, who objected strongly and effectively to the invasion of the trolley, along their well-kept highway, at least, as being fatal to life and detrimental to peace and comfort.

"Yes, sir; from here down to Girard avenue, within ten blocks of the City Hall, brickyards used to be thick. In those days men were paid better wages than they are now. Men used to get $2.50 and $3 per day. Why, wheelers used to get $2 and $2.25, and I have known boys to get as high as $1.75, although $1.50 used to be the regular pay. The first year I sold brick I got $10 per thousand. Now we only get $5, and I have known press brick to fetch as high as $60 per thousand. Now you can buy them anywhere for $16. My nine gangs, however, make as many as twelve gangs formerly, because they used to use the single mold only. Here we use some single and three molds, and consequently I get 3,333 brick from a gang consisting of a molder, wheeler and offbearer, as against 2,332 in the old days—1,001 bricks more from each gang, aggregating 9,009. Outside of this, we make brick in the same old way. Our tempering pits are about the same, and we use horses."

The plant covers about seven acres, Mr. Byrne having disposed of seven, and on this are four eight and nine-arch kilns, four tempering pits and the usual drying racks and sheds.

In company with the son, Frank J. Byrne, I looked over the grounds. The clay bank is good, and the high, rising ground makes it a good one for drying, and all they ask for is wind or sun.

"You see, our kilns are not very big. I don't like big kilns. When you have a bad burning, you have an awful pile of bad brick. So we concluded the smaller kiln is best. My son Frank is a good worker, and knows as much about brickmaking as I do. We've turned out between four and five million this year, and by this I mean we've sold them. We generally reckon to close down the second week in October, but we are a little later this year on account of the past season."

"When is Philadelphia going to have a convention?" This is a question put to me several times of late, and it causes some reflection on my part as to whether the caterers of this city needed three months' notice before preparing a good, stiff dinner, or whether we have a hall large enough to shelter the entire delegates and members. Anyway, it's to be Detroit next year, where the air is salubrious and the river runs deep and clear. Maybe I'll reserve my annual bath until then. Meanwhile we'll endeavor to find out how many of the fraternity are ready and willing to test Detroit's well-known hospitality and enjoy her well-paved streets, carriage drives and well-equipped railroad service.

W. P. Lockington.

THE IOWA CONVENTION.

The Twentieth Annual Convention of the Iowa Brick and Tile Association will be held Wednesday and Thursday, Jan. 17 and 18, 1900, in Mason City, Ia. A most cordial invitation is extended to all clayworkers, clayworking journals and machinery men to be present. Mason City has ample hotel accommodations of high class to care for all, and the railroad facilities are such that direct routes are open from every direction. We promise a good meeting, a pleasant and profitable meeting, and want everybody to come. Respectfully,

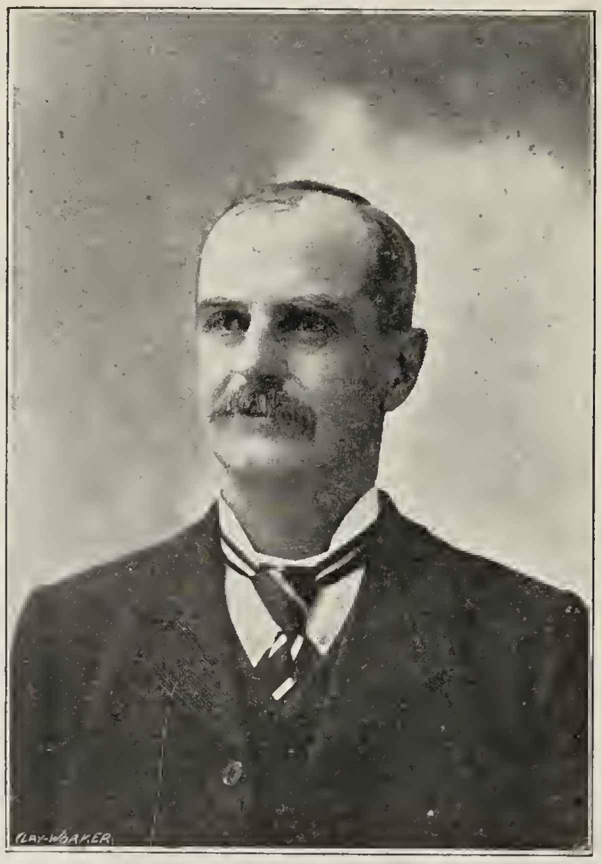
O. T. Denison, President, Mason City.
Robert Goodwin, Jr., Secretary, Redfield, Ia.

RANDOM THOUGHTS ON BRICKMAKING.

In THE BEGINNING there was no light and darkness was on the face of the deep. In the beginning they put straw in the brick. What! You heard that before, did you? Well, how many paces farther have you gone now in brickmaking for profit?

There is still "no light" on the subject of profitable brickmaking such as there should be. Make better brick now do we than in the beginning? Perhaps we do, but one fact is certain, the cost price and the selling price are entirely too close together. One trouble in this businesss with most brickmakers is they don't know how much their brick cost them, hence they don't know what the selling price ought to be.

They calculate the labor cost from the pay rolls, supplies and fuel from the expense account, and think if they get 25c. to 50c. per thousand above this they are making brick profitably; but it is all a sad mistake, for at about the end of ten years they will find their factory a complete wreck and worth about 5c. on the dollar of its original cost, with the clay bank and bank account exhausted also.



O. T. Denison, President Iowa Brick and Tile Association, Mason City, Iowa.

It afforded a living for the owner while it lasted, but the first cost of the plant would have paid him a fair salary for the same time and saved him much hard work and some gray hairs.

I don't think there is any manufacturing business that runs generally in such a "topsy-turvy" manner as brickmaking. No business that is operated with less system than brickmaking. No business more alluring and inviting to capital as to profits which can be obtained, and no business more ruinous in final results than brickmaking, unless in the hands of the greatest skill obtainable. Even then failure may come, for none of us know what we should to be sure of our end in this business.

To prove there is but little system to our methods of brick manufacturing, go with me from Maine to California and from the Great Lakes to the Gulf of Mexico and you can scarcely find two brick factories alike in their arrangement, buildings, dryers, kilns or machinery.

All are different, and at each factory you will find the "Boss" with a "knowing" wink in his eye and an expression of "I know but won't tell" on his face who could give you cards and spades and then win out against any other fellow brickmaker. Every man feels that his way is the best, and so he does it that way whenever he gets a chance. As we have found no best way to build our brickyards which meets the approval of the craft, hence this great lack of uniformity in their construction.

The only reason to be given for all our failures, our illy constructed factories and our inability to make money out of brickmaking is, we don't understand our business thoroughly. So please let us have more conventions and a freer exchange of knowledge and more ceramic schools. ITHAMAR.

Written for THE CLAY-WORKER.

THE EVOLUTION OF BRICK PAVEMENTS.

Some Fine Examples of What Brick Streets Should be—Ten-Year-Old Pavements in Cleveland Still in Excellent Condition—How They Were Laid.

WE HAVE FOUND the study of pavements a most interesting one. It has been pleasant, among other things, to note the readiness with which communities adjust themselves to their local conditions and surroundings.

In Chicago we found ourselves in a region of either fine, shifting sand of the lake shore or the muck of the prairies, lying but a few feet above the level of the lake; her black, murky soil a veritable swamp in wet weather, and everything afloat on the breaking up of spring. Under such conditions, and with no material of her own suitable for a roadbed, with one hand she seized upon the product of the forests which lined the shores to the north of her for paving, and at the same time bridging her inky depths. With the other hand she laid hold of the limestone lying but a score of miles south of her limits, which both canal and railways brought cheaply to her doors, for macadamizing her sandy regions. And so we find her to-day with nearly 800 miles of roadway from forest material, and about 400 from the near by quarries, with but about 10 miles of granite from the more distant region of central Wisconsin, to which she has but recently added asphalt from far-away Trinidad or California, and brick from the shales of her own State.

Ex-Pres. F. H. Eggers contemplates the Vitrified Paving Block going down on a new street with satisfaction.

At Terre Haute we found quite a different condition of things. With much better natural foundations for a roadway, she long contented herself with gravel or macadam until, to better her condition and to put herself in line with sister cities of her class, and having no developed home resources, she brought paving brick from near 400 miles east of her some nine years ago and laid the pavements described in a previous paper.

Cleveland, on the other hand, lying high and dry above the lake, with her sandy loam foundation, in the main with less difficulties to contend with than her sister of the swamps and shifting sands, carved out no new paths, because the necessity was not laid upon her. She found a very excellent material in Medina stone about 200 miles away, and, following the fashion of older cities to the east of her, she built her roadways in the main of it. It has proved an excellent material for this use. In character it is a very hard sandstone, not so hard as granite, but very near it, and quite superior to it in that it does not by wear become as slippery as granite. Over 300 miles of these pavements may now be found doing service in this substantially built city. Over 250 miles of this pavement is made from what is known as dressed stone, the face and sides having been brought by dressing to a degree of trueness not generally seen in granite blocks. Some 50 miles is paved with "common Medina," so called, it not being "dressed," but left more in the rough, and of this 50 miles about 17 miles are cement filled, while the balance is sand filled, these being the terms used in the office of the city engineer.

Any one visiting Cleveland and noting her stone-paved streets will be willing to concede that they are of an excellent character, with a better face than is common to stone pavements found elsewhere, and very uniformly in excellent condition. The stone is of so good a character for the purpose that at an early day Chicago laid several miles of pavement in the use of it, superseded by the granite paver found perhaps five hundred miles nearer home. Cleveland men had too substantial ideas to take kindly to macadam, having to-day only about one mile of it and some six miles of cinder. Neither did she look with favor upon wood block pavements, although the lake was a highway for bringing the material cheaply to her doors. She required no pontoons in the guise of pavements, and we find her to-day with but about twenty miles of wood block pavement, all laid previous to 1876.

Bolton Ave. between Euclid and Haugh Aves, Cleveland. Fire Clay Pavers.

We are now ready to take an intelligent view of the city's position with regard to the laying of

BRICK PAVEMENTS.

The end of the present year will find her with about fifty-five miles of such pavements, some eighteen of which will have been laid in 1898-9, being a gain of about 50 per cent. during the past two years, and we may note in passing that during this same period but about 4 per cent. has been added to the mileage of stone pavements, which makes it very plainly evident that Cleveland is also emerging from the "stone age" and stepping into the "age of clay."

It may be well to ask here, Why this change? We may answer, not because her stone pavements were not good, but because brick was shown to be both a smoother and a handsomer pavement, and because, with this brace of considerations in its favor, it promised to be less noisy, and, not the least important item in the list, it could be laid at a lessened cost.

We wish to note here the courtesy shown to us, while making our investigations, by Mr. J. P. Bayne, assistant city engineer, who kindly placed at our disposal such books and papers as we needed, and very cheerfully answered our many inquiries. With this aid we ascertained that the first brick pavements laid by the city in 1889 were paid for at the rate of 13 8-10 cents per square foot of surface. We do not know what the then current price for stone paving was, but find that at the present time 27 cents per square foot is being paid for dressed Medina stone, a difference, as will be seen, of nearly 50 per cent. in favor of brick. A year later and the prices for brick were 14 and 15 cents per foot, while in 1894 the prices paid reached the low water mark of 9½ cents per square foot, but it must be remembered that the conditions attending the laying were the same as attended the laying of the stone pavements, viz., the brick were laid on a well-settled and rolled sandy bed, without the need of hauling out any bedding or foundation material.

Giddings Ave. between Euclid and East Prospect St., Cleveland. Shale Brick laid in 1894.

We note in this connection that a few pieces of brick block paving, laid in 1897, having a six-inch concrete foundation, employing Louisville (native) cement, were paid for at the rate of 17¾ to 18½ cents per foot, and if our comparisons be between dressed Medina stone, laid on a sand bed, at 27 cents per foot, and clay paving blocks, 3½x4x8½ inches, laid on a six-inch bed of concrete, at 18 cents, we find a 33 per cent. saving in the use of the latter, which is as much as saying that, great as the advance is that has been made by brick pavements the past two years, it must, in the nature of things, be relatively greater in the future.

But what of asphalt? We find that hard-headed Cleveland officials have not followed the example of Buffalo in this regard, and are not consequently at the present time confronting the grave problems which perplex the city fathers of that very enterprising municipality. There will be at the end of the present year but about nine and three-quarter miles of asphalt pavements in Cleveland, and, if we compare the relative cost with brick, we find the price of asphalt to be 25 cents per square foot for Trinidad asphalt, with a cut of 5 cents per foot in a recent bid by the Alcatraz asphalt promoters.

The first piece of brick pavement laid in this city was on Bolton avenue, between Euclid and Summer, in 1889. The brick employed were of the ordinary size, and were made of Ohio's excellent plastic fire clay. The foundation was the sandy soil of that section of the city, and the filler was of Portland cement. The next year three more pieces of pavement of the same character were laid in the same section of the city. These were all residence streets, in an excellent neighborhood, where good improvements prevail. So far as we examined these pavements we found them in as perfect order as though laid within a twelve-month.

These pavements are the first of this character that have come under our notice, differing, first, in the material of which the brick are made, all our previous investigations being confined to shale clays, and, second, differing in the fact that in connection with a sandy foundation a cement filler is employed. Again, here was but one course of brick of common size, on a sand foundation, while in Chicago two courses were employed on a similar foundation and in connection with a sand filler. One such pavement, laid in 1892, we described. We noted, in connection with that pavement, that there were "slight depressions, a little loss of perfect contour here and there, noticeable where one is searching for defects." In the Cleveland pavement now under consideration we saw not the slightest evidence of flatting or depression, although two years' longer service had been borne, while the character of the street traffic must have been about the same.

Of course, it must be admitted that conclusions reached, based on the facts already presented, would not be accepted as conclusive by others, since we do not know whether there was equal care in the preparation of the two foundations, but in our own mind the testimony was accepted as satisfactory that one course of brick, laid on a sand foundation, with a cement filler, well applied, will result in the production of a more enduring and noiseless pavement than one of two courses, laid upon the same foundation, and having a sand or tar filler. No doubt our experience and observations made at Terre Haute, as already presented in former papers, aided us in arriving at this conclusion. We would not give this matter so much space if we did not deem it a very important one.

We are well aware that the laying of double courses of brick is well past, but the day of laying pavements of brick upon a sandy bed in the residence streets of our large cities and in the business streets of our small towns has but just commenced, and the best way of doing this is worthy of any attention that may be given it. Nowhere have we seen the problem so well worked out as in Cleveland, covering, as it does, an experience of ten years of service, and, at the end of that period, perfect condition of the pavements under consideration. Now, while these residence streets are not subject to the continuous heavy traffic which is common on our business streets, it must be borne in mind that they must bear more or less of this heavy traffic, as witnessed in the shape of heavy coal wagons and trucks hauling stone, brick and other heavy building material for neighborhood improvements. Only warehouse and manufacturing districts will see heavier loads than are at times to be seen on these streets. Ten years of service, then, and perfect condition, such as we found, furnish most valuable testimony, not only for the paving brick maker, but for the paving brick user.

Many a neighborhood blessed with the right kind of soil for a foundation may see its way clear to the laying of such a cemented brick pavement, laid upon a natural bed, where the cost of a concrete foundation would render it inadmissible. Some of the problems which confront the city engineer of today concerning brick for pavements, sewers, etc., are hardly solved. It takes years to reach safe conclusions, and it is because the facts we have presented concerning this special class of brick pavements are not generally known that we feel the need of dwelling upon them. Only yesterday we learned from

Intersection of Genesee St., and Crawford Road, Cleveland.

a vitrified-brick maker that he had closed a contract with the city of St. Louis for a supply of vitrified brick for relining some of its brick sewers. When the sewers were built such brick were unknown.

It is only a few years since F. B. Many, of Cleveland, induced the authorities of that city to use a few courses of vitrified brick in the bottom of sewers then being built, while now the same gentleman informs us a single sewer (Walworth run) is being constructed that will require the use of about forty million of such brick. But to return to our subject of paving brick laid upon a foundation of sandy or gravelly loam. We have a letter before us, signed by Engineer Bayne, of Cleveland, in which, answering our inquiry, he says:

Spangler Ave., Cleveland.

“WE ARE SATISFIED

With sand foundations and a cement filler, except in clay soil, when we use concrete foundations.” We present some other considerations in favor of such pavements before taking up other matters: First, a cemented pavement on a soil or sandy foundation is necessary, as against a sand filler, from a sanitary standpoint. The litter and befouling of the pavements should not be allowed to be washed into the soil, but be carried by the gutters into the sewer system, and thus disposed of. Again, a well-cemented pavement is, as we have shown (or may be made), a comparatively noiseless pavement, closely approaching asphalt in this regard. We refer to our first Terre Haute paper for evidence on this point.

As against these favorable considerations, some one may suggest the greater difficulty of removing a section of the pavement in the making of repairs to water pipes and our other underground systems. This charge is allowed to stand, but we would ask, Should the ninety-nine days of more effective service wait upon the special needs of the one day? But we would further answer that such objection only, to our mind, presents another argument in its favor, for the very difficulty of removing and then properly relaying a cemented pavement should put a stop to the loose ways of treating such removal of a section of a pavement as result in depressions and unevenness, and hence the unsightly, uncomfortable and destructive features associated with so many pavements. The more difficult the repairs the more likely that skilled men will be called in to make them, and the more likely an intelligent city government will be to demand it.

Believing it will be a matter of interest to those reading an article of this character, as it has been to us, we present brief extracts from the specifications which govern the laying of this character of pavement in Cleveland. These specifications seem to us unique in this regard: the frequent repetition of the phrase, “as the chief engineer shall direct,” or “as directed by the chief engineer.” We make our extracts as brief as possible, aiming to cover only the most material points. It will be noticed, we think, that unusual care is taken to make the sand foundation a perfect one, and this is vital, and to it is no doubt largely due the excellent condition of these pavements after a decade of service.

FOUNDATIONS.

Ballasting.—Upon the subgrade, when properly prepared, shall be placed a bed of ballasting of bank sand or gravel, of a quality to be approved by the chief engineer, to a depth of not less than eight inches under the bottom of the brick, except such places where, in his opinion, portions of the material found in place are suitable for ballast, in which case such additional amount of ballast shall be added as he may direct. The ballast, when in place and properly rolled as specified, shall be brought to a proper crown by use of a scraper, as directed by the chief engineer.

Puddling.—The roadway to be thoroughly puddled by flooding with water from curb to curb, including curb trenches, such number of times and to such extent, during or after the grading or ballasting, as the chief engineer shall direct.

ROLLING AND TAMPING.

The ballast, after being properly puddled, shall be brought to the proper crown by having all dams leveled off and depressions filled up, and shall then be made hard and compact by rolling and tamping in such manner and such number of times as the chief engineer shall direct. The roller, to be not less than three and one-half feet in diameter or four feet on the face, shall be loaded to weigh from seven to eight tons, as required by the chief engineer, and shall be so arranged and operated as to roll the entire roadway, returns and intersections between the street curbs. * * * All places that, in the opinion of the chief engineer, have not been or cannot be properly rolled, as above required, shall be tamped with square hand tampers of not more than twelve inches square face and not less than ninety pounds' weight. The rolling and tamping of the foundations shall always be kept at a distance of not less than one hundred feet ahead of the pavement, unless otherwise permitted by the chief engineer.

SCRAPING AND CROWNING.

The foundations thus prepared shall be brought to a proper crown by the use of a scraper of such design and curvature as the chief engineer shall direct. All irregularities in the surface that do not conform to a true crown shall be removed by additional ballast, rolling, tamping or scraping, as the chief engineer shall direct, and the fundations shall be true in crown and made hard and compact by use of a heavy hand roller of approved form and weight, and, if deemed necessary, by the chief engineer, the scraper shall be again used and the surface rerolled, as directed, before any paving material shall be placed thereon. * * *

Morse Ave., Cleveland. Laid in 1890.

THE PAVEMENT.

After having been laid and rammed, or during the process of ramming, shall be thoroughly rolled such number of times as ordered with the same weight of roller as specified in the foundaions."

While the specifications call for "bank sand or gravel" as a ballast, we are informed that the contractor is often permitted to use nothing but the earth which previously formed the roadbed. Of course, the permit is covered by the clause, "except such places where, in his (the engineer's) opinion, portions of the material found in place are suitable for ballast." The conditions are not such as to permit this in all parts of the city, but did appertain to the section we have mentioned and others visited by us. In conclusion, in this paper, which covers but a partial report of our investigations, we cannot forbear saying that the engineering department, judging from the results witnessed, has seemed to use its reserve power, which is not small, in the interest of good roads and honest work.

E. G. Durant.

Written for The Clay-Worker.

PAVING BRICK, PAVING BRICK MANUFACTURERS AND STREET PAVING.

BY GEO. J. M. ASHBY.

AN ASSOCIATION existing, professedly, for the sole advantage of Chicago ratepayers, some newspaper articles, and a little trade jealousy, have formed the basis of a controversy respecting the vitrified brick pavements that are coming into such extensive use in the great city of the lake.

It has taken some years of effort, of missionary or pioneer work, to get vitrified brick recognized in Chicago for what it is, the best, as well as cheapest, paving material.

As human nature is constituted, it is not surprising that brickmakers, who have made neither effort nor sacrifice in the pioneer work, would be quite willing to reap the fruits. This they are perfectly justified in doing by all fair means and representations. Happily, these are business methods that are commonly employed by the men who work in clay, and if the newspaper articles did not represent the case with perfect fairness, this was probably due to insufficient knowledge on the part of the men who run the "Ratepayers' Protective Association." The paving bricks which our "protectors" specify as suitable for the 500 or 600 miles of Chicago streets that are in such urgent need of being repaved are made at Brazil and Terre Haute, Ind., and Springfield, Ill., and it becomes a matter of interest to see what these plants are capable of doing.

The first city we visited was Terre Haute, Ind. The eight miles of brick paving in this city and its great superiority over the asphalt paving of something like equal extent has been discussed in recent issues of The Clay-Worker, and will need no further description. The asphalt pavements are in bad shape, while the brick pavements are in excellent condition, due to the good quality of the bricks, the very careful manner in which they are laid, the use of a two-inch sand cushion, Portland cement filler, and, to some extent, the comparatively light traffic they have to support.

With a letter of introduction, setting forth the object of our visit, to W. P. Blair, the able and amiable secretary and general manager of the only paving brick plant at Terre Haute, the door was wide open.

THE TERRE HAUTE BRICK AND PIPE COMPANY

Was established in 1894. The president is Major Collins; vice president, J. G. Bryson; treasurer, W. R. McKeen, and the secretary and manager, W. P. Blair.

The extensive tract of land owned by the company contains coal of good quality, which is mined, but the operation of the coal mines did not interest us. The brickmaking machinery consists of a "Big Wonder" auger brick machine, with a cutting table for side-cut brick operated by hand. The "Big Wonder" is made by the Wallace Manufacturing Company, of Frankfort, Ind.; one re-press, made by the Bonnot Company, of Canton, O., for re-pressing those bricks that are intended for pavers, and a nine-foot dry pan by the late firm of A. Bonnot, of Louisville, make up the list of the principal machines.

An interesting feature of the dry pan was that it was, to a certain extent, home made. The pan itself, gears, shafting, pulleys, etc., had been supplied by Bonnot, but the crossbeam of timber was provided by the brick company, and also the supports on each side, which latter were of vitrified brick, so that the frame of the dry pan was a composite construction consisting of a wood crossbeam and brick supports; the whole making a substantial machine, which would be more economical, particularly at the present price of iron, than the usual construction.

On the occasion of our visit the plant was shut down for repairs, but it was evident that everything was kept in good order.

From the brick machine the bricks go to the dryers. There are two of these, one a "Standard" six-track; the other built by the brick company, similar to the "Standard," has four tracks in operation. Live steam is used to heat the dryers. Sewer bricks, which form the principal part of the output of these works, take 48 hours to dry, while paving bricks, or "blocks," being somewhat larger, take 60 hours to dry.

The kilns are ten in number, all of the ordinary round, down-draft type, with perforated floors, and eight furnaces to each kiln. Most of the kilns are 30 feet in diameter, and would hold about 60,000 bricks.

All the burning is done with bituminous coal. Water smoking takes about 2½ days; the fires are increased on the third day. The burning is judged by the color of the fire and by drawing samples.

Both sewer and paving bricks are made from a mixture of shale and common clay. The paving bricks have a smaller proportion of common clay than the sewer bricks contain. It is maintained that the presence of common clay and very slow cooling in the kiln produce a tougher brick.

The paving bricks, or blocks, measure 3x4x9 inches. The price of these, on cars at works, was said to be $10 per 1,000, but the demand for bricks of all kinds had been greater than the capacity of the plant and orders for 100,000 bricks had been recently refused. The plant was fully described and illustrated in the August Clay-Worker.

The next paving brick plant to be visited was at Brazil, Ind. This is known as the works of

THE INDIANA PAVING BRICK AND BLOCK COMPANY,

Though it is owned by an individual, Mr. W. W. Winslow, who came into possession of it early this year.

The works were originally planned for making sewer pipe, though no sewer pipe machinery was put in, but the main building was erected with floors for drying sewer pipe in the usual manner. This building has been converted into a "Standard" nine-track dryer, and the upper floors are not used.

The brick machine here was from the factory of E. M. Freese & Co., of Galion, O. This has a capacity of 30,000 per day, though not more than about 27,000 per day are made on it. One Raymond re-press is used for re-pressing paving bricks. There are two dry pans, one, we believe, a seven-foot, by the American Clayworking Machinery Company, of Bucyrus, O; the other, still smaller, was a wet pan and has been converted, but the grinding capacity is barely sufficient.

Paving bricks at this plant were at one time made from a mixture of common clay and fire clay. The fire clay was the waste material that had to be taken out in mining coal. This produced a pale-colored brick. Some that we saw on the yard appeared to be of excellent quality, but this method was abandoned some time ago, and has never been employed by the present proprietor. The material used now is a mixture of common clay and shale. The shale is brought in by rail from a distance of about two miles. The clay pit is alongside the Sheridan Brick Company's (building brick) works and pit.

The kilns here are round, down-draft, of the ordinary construction, 26 feet in diameter. There are 13 of them, each holding about 30,000 bricks. The capacity of the works, if running the whole year, which they have not hitherto done, would be 7,200,000 bricks. About 55 people are employed at the works, or, including the men digging clay at the pits, about 70 all together. At the time of our visit there were not more than 60,000 bricks on the yard, nearly all of these second quality bricks that would be sold for building purposes, but we were informed that the week before three cars of bricks had been sent to Chicago. The means of transportation are the Vandalia and the C. & E. I., but a scarcity of cars had recently been giving trouble.

Brick pavements at Brazil are not laid so well as those at Terre Haute. Instead of a six-inch concrete foundation there is only a six-inch bed of crushed furnace slag. This is rolled with a ten-ton (or fifteen-ton if they can get it) roller. On this bed a two-inch sand cushion is laid, and after the bricks are placed in position they are rolled with the same roller that is used for the bed. The filler employed is a cement ground. This pavement will doubtless answer very well for the light and infrequent traffic of a small town. The cost is low, being but $1.25 per square yard.

EXCELSIOR CLAY WORKS.

There are two plants at Brazil which, on occasion, make paving bricks, and the "Excelsior" is one of them. This is owned by an incorporated company, with a paid-up capital of $50,000. The president is George Brandenburg, the secretary and treasurer Josiah Brandenburg. These are the brothers Brandenburg who secured the franchise for the General Electric Railway of Chicago, whose struggle to get across some steam railroad tracks created quite a sensation some time ago. One of the railroads deliberately wrecked a train of its own cars in order to stop the General Electric while an injunction of sufficient efficacy was procured.

Mr. George Brandenburg, whose courtesy we wish to acknowledge, not only for full information, but other kindness, told us the yard was bought for the sole purpose of making bricks cheaply with which to pave the tracks of the General Electric Railway, but the fascination of the clay industry seems to have laid hold of Mr. Brandenburg and, although the General Electric no longer needs paving, he continues to give much of his attention to the work.

The works of the Excelsior company are small—just large enough to occupy a wealthy man who spends his winters in warmer climates. The machine upon which bricks are made is a "Hoosier," made by Madden, of Rushville, Ind. With this there is a hand-power cutting table, made by the American Clayworking Machinery Co., of Bucyrus, O., and a two-mold Penfield re-press, made by the same company at their works at Willoughby. The auger machine can produce 30,000 bricks per day; 25,000 of these are re-pressed; the remainder are left as wire cuts, go into the bottom of the kiln and are sold for building bricks.

On the other side of the building is a "Centennial" auger machine, but this is reserved for the manufacture of hollow blocks. From the machines the ware goes to a "Standard" drier; this has four tracks. The kilns, four in number, are 26 feet in diameter. They are of the ordinary round, down-draft type, and call for no particular description. The hollow blocks burned in them are of excellent quality, due, to a considerable extent, to the care and attention of H. Fuetterer, the burner.

During the winter only hollow blocks are made. The output of hollow blocks is about 150,000 pieces. In the summer the manufacture is confined to vitrified bricks. The season's output of these is 2,500,000.

The bricks are made of shale, with the addition of one-eighth of potter's clay to reduce shrinkage. Two sizes of paving bricks are made, a standard size which, when burned, is 9x4x2½ inches, and a "block" measuring 9x4x3 inches. The prices are: Standard, $9; block, $10 to $10.50, on cars at works. Unfortunately, the transportation facilities are not of the best.

The bricks made at these different works are all of good quality and there was little or nothing to choose between them. In our next we propose to describe other paving brick works within reach of Chicago.

(To Be Continued.)

MEETING OF FIRE BRICK MANUFACTURERS.

THE ANNUAL meeting of the National Association of Fire Brick Manufacturers was held in Philadelphia Sept. 27, at the Manufacturers' Club. A large number of letters was received from manufacturers from all parts of the country expressing regrets they could not attend owing to the pressure of business, etc. They also reported that they had advanced prices on fire brick from $5 to $8 per thousand, and on shapes from 25 to 30 per cent.; that the demand was very large from the old smelting furnaces that were now being overhauled and rebuilt, and many of them were compelled to refuse orders. They found great difficulty in procuring fuel, and many places difficult to get workmen, also cars for clay. The attendance was not as large as usual, and can only be explained by the members finding it difficult to spare the time to attend on account of the rush of business. Quite a large delegation visited the Export Exposition, also took in the sights of Philadelphia. After a social dinner the following officers were elected:

Cyrus Borgner, of Philadelphia, President.
M. D. Valentine, First Vice President.
Joshua Hunt, Second Vice President.
Jerome L. Boyer, Treasurer.
Henry Gleason, Secretary.
F. A. Handy, Chairman of the Executive Committee.

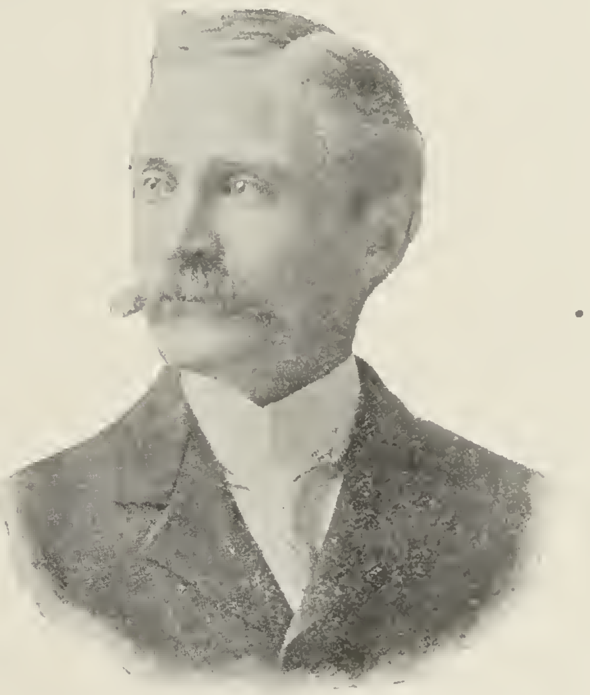
THE LIFE OF PAVEMENTS.*

BY GEORGE W. TILLSON,

Member American Society Civil Engineers. Principal Engineer Department of Highways, Brooklyn, N. Y.

WHEN ONE SEEKS to purchase a new article the first question usually is what does it cost? And if it be subject to wear there immediately follows, how long will it last? And, although asked second, this latter question can hardly be said to be of secondary importance. For, while the first cost of an article may determine one's ability to buy it, it does not by any means settle its economy, for what is cheap to obtain at first is often most expensive in the end.

So when it comes to the selection of a paving material the question of durability is of the utmost importance. What is the life of a particular kind of pavement? The question is often answered off-hand by the tyro positively, and with little hesitation, but the engineer of experience who has seen a pavement last a certain time on one street, and twice as long on another, has seen the result of this condition here and another there, gives his reply hedged in by so many provisions that at first sight it would seem to be of little value. But when it is carefully studied the discovery is made that these restricting conditions are just what are required to adapt the reply to any particular case that may happen to be in point.



GEO. W. TILLSON, C. E., Brooklyn, N. Y.

To the study then of the varied conditions affecting the life of a city pavement this paper will be given.

The two great agents that tend to destroy a pavement are traffic and the atmosphere. The former is variable, and its effect varies directly according to the amount applied under certain conditions. The action of the latter is constantly depending somewhat upon the climate, but principally upon the nature of the paving material.

Traffic and the atmosphere act positively, and their results can be measured. At the present time it may be said that there are four materials being used in street pavements —stone, brick, asphalt and wood. The action of traffic and the atmosphere is very different upon these materials as affecting durability. It is safe to say that the life of stone and brick (taking it for granted that none of their kind of a quality to be acted on by the air would be used) in a pavement depends, other things being equal, directly on the amount of the traffic they sustain, but that statement would

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(Paper read before the sixth annual meeting of the American Society of Municipal Improvements.)

not be true of asphalt and wood. For should the traffic be light the life of the pavement would be ended by the action of the atmosphere—asphalt not to such an extent as wood, but it is well known that an asphalt pavement deteriorates materially under the oxidizing effect of the air, even if it have little or no traffic.

It must be remembered, also, that there are two ends to all pavements, the physical and the economic end. The former comes at a time when the pavement is so worn out that it cannot be repaired and must be entirely relaid; the latter when the cost of repairing is such that it will be cheaper to relay it entirely than to spend any money on repairs. These two ends do not necessarily come at the same time. The former test will generally be applied to stone, brick or any block pavement, and the latter to asphalt or macadam. When a pavement is made up of moderately sized parts of practically the same character and texture, the wear on these parts is practically the same and the repairs necessary are generally relaying old material, rather than furnishing new. But when the pavement is made up of parts so small that they must be consolidated into a continuous whole before they can be available it is different.

The physical end of a pavement can be determined by observation. Blocks wear on account of abrasion and impact. Granite wears in two ways, by chipping and rounding off of the corners, and the gradual grinding off of the blocks under the friction of wheeled vehicles. When the blocks are of the harder granite or traps the former action takes place. The softer granites and the sandstones wear down smoothly with flat surfaces, and in time the blocks actually become worn out, the pavement becomes rough, horses stumble, and it is soon seen that the street should be repaved.

Asphalt and macadam wear away, and new material can be added in large or small quantities as may be desired, and the physical life of the pavement prolonged indefinitely. It is then that the economic test is applied to ascertain when the pavement should be renewed. Assume that a street is paved, but the expense of keeping it in good condition is considerable, and this question arises, shall the repairs be continued, or shall an entire new pavement be constructed?

Letter N equals life of proposed pavement.

Letter C equals cost.

Letter I equals rate of interest.

Letter R equals estimated cost of repairs, if distributed over entire life.

Letter A equals sinking fund to be paid each year to equal C at end of N years, then A plus CI plus R divided by N equals annual cost of a new pavement.

Take, for instance, an asphalt pavement, and let N equal 15, C equal $1.50, I equal 3½, and R equal $0.40. A will .0807, and the equation becomes .0807 plus .0525 plus .0267 equal $0.1599, or if the street be repaved it will still cost annually $0.16 until it is renewed. It must be remembered that C is equal to first cost less the value of foundation and other material at time of renewal. From the above it would seem that it is economy to repair an asphalt paved street rather than to repave it when the cost of repairs is much less than $0.16 per yard, provided the assumption of 15 for value of N is correct, as if there is any error in the other values they must be too small rather than too large.

Let then N equal 20, other values being the same (R being obtained by taking a guarantee period of five years and assuming cost of repairs 4 cents per yard per year for remainder of life), and the equation will become .0531 plus .0525 plus .03, equal $0.1356 as the annual cost when N is taken at 20 instead of 15. The author believes that this is the engineering and the only true way of determining when an asphalt pavement should be relaid. The only element to modify this principle is the inconvenience business men and merchants may be put to by having repairs made on a street too frequently. The determination of this must be a matter of judgment to be applied in each particular case. But the principle of the formula is right, and when cities have had a few years more experience with asphalt there will be no trouble in determining the true values of the variables.

Coming down to the actual conditions by which traffic is modified in its action on pavements, it will be seen that there are five, viz.: Character of the pavement, width of roadway, presence or absence of street car tracks, state of repairs, and how well cleaned.

The one great agent that acts upon a pavement is, of course, the traffic that passes over it. This is very hard to measure, and very few attempts have been made to do so in the United States. The custom has been to speak of heavy, medium and light traffic streets, but with a very vague idea of what these terms meant, forgetting, too, that as so used they are only comparative, as medium traffic in a large city would generally be heavy traffic in a small one. Traffic has been generally measured in this city by assuming a certain weight for vehicles of different descriptions, and by counting the passage of the vehicles on a street during a given time, thus arriving approximately at the amount of tonnage passing over it. The results are generally given without regard to the width of roadway, making it very difficult to compare results arrived at in the different cities. In England attempts have been made to reach more scientific results and the tonnage per yard of width of roadway per day or per year has been taken as the unit. This enables one to compare directly the traffic of one city with that of another, although it must be remembered that the passage of ten vehicles weighing one ton each register the same as one ten-ton truck, when it is probable that the latter would do much more damage than the former. This method, however, is probably as definite as the former.

In 1885 General F. V. Greene had a series of observations taken in many of the principal streets of the leading cities of this country to determine the amount of traffic. The total number of vehicles passing between 7 a. m. and 7 p. m. was counted, the largest number being given in each case, so as to give an opportunity for comparison.

Broadway, New York	7,811
Broad street, Philadelphia	6,081
Devonshire street, Boston	5,362
Douglass street, Omaha	4,752
Fifteenth street, opposite treasury, Washington	4,520
Clark street, Chicago	4,389

While the author would not state that an attempt was made to get the heaviest traffic street in each case, persons familiar with these cities will recognize that they are representative streets.

In Paris the vehicles passing on the following streets in twenty-four hours were:

Rue de Rivoli	42,035
Avenue l'Opera	29,500
Rue Croix des Petit Champs	20,480
Rue St. Honore	19,672

And in London:

King William street	26,793
Grace Church street	15,585
Queen Victoria street	16,531
Cheapside	15,206
George street, in Sydney, Australia	11,960

Great Howard street, Liverpool, sustains a traffic of 216,000 tons per yard of width per annum.

This shows very plainly that the pavements in the large European cities are subjected to much more travel than those of this country.

—Width of Roadway.—

The distance between curbs affects traffic as it tends to scatter or congest it. If a street is to sustain a certain amount of tonnage the greater surface it can be spread over the less it will injure the pavement. This is also true when the load is reduced to a unit of width, especially if the roadway be small and the traffic continuous. In a narrow, well-traveled street the carriages and trucks move in well-defined lines, one behind the other, so that it is impossible to scatter it and subject the entire surface to anything like uniform wear. Ruts are worn in the pavement, and the time comes for its renewal long before it would have could its work have been distributed evenly over it.

—Character of Pavement.—

By this is meant the detailed method of its construction. The laying of asphalt has been practically standardized, and there is not much difference in the methods of the different companies. But granite, brick and wood vary much as to foundation and joint filling. Wood, too, is often treated chemically so as to entirely do away with the climatic action, and this renders it necessary to study it from the standpoint of traffic only. Different kinds of wood are used in different sections, each having a different life as a result of the physical as well as the chemical action.

To obtain the best results from a block pavement it should be laid in such a manner as to receive the traffic vertically upon the face of the blocks, and so substantially that the blocks will maintain their position while in use. To accomplish this the foundation must be such as to sustain the loads liable to be imposed upon it, and the joints filled with some firm and enduring material. This is necessary for two reasons, to keep the blocks in position and to prevent water from reaching the foundation and injuring it. While the fulfillment of these conditions adds to the expense, the life of the pavement is prolonged sufficiently to more than compensate for it.

—Presence or Absence of a Street Car Track.—

A street car track has a great bearing on the action of traffic. It concentrates travel, and in a street where the tracks are in frequent use practically reduces the roadway to the space outside the rails, with all and more of the evils of a roadway of that width—more because there is almost no opportunity to get out of the regular route by using the center, which sometimes happens in a roadway without tracks as wide as the vacant space. True, such travel is accommodated on the rails, but the gauge of the heaviest trucks is greater than that of the cars, so that one wheel runs on the pavement, and being confined absolutely to the same place, soon wears a rut in the hardest blocks.

In the fall of 1896 Kent avenue, Brooklyn, was paved with the best granite that comes to the New York market, on a Portland cement concrete base, with tar and gravel joints. This street is probably subjected to as many heavy loads per day as any street in Greater New York, is thirty-six feet wide, and has a double line of street car tracks. On one side of it are the big sugar refineries, which send daily over this pavement in their busy time some 1,000 or 1,200 loads of sugar weighing about eight tons each. It seems almost impossible for the teams to travel without the wheels of one side being in a car track. This brings those of the other side about eighteen inches from the corresponding rail. After the pavement had been thrown open to traffic for six months a rut, perhaps an eighth of an inch deep, was worn in the blocks, and on the cross walks was plainly visible. The sugar companies, who had paid one-half of the cost of the pavement, made a strong effort to scatter the teams, sending men on the street for this especial purpose. But it was only driving the wheels from one rail to another, and soon other ruts were formed, and to-day, after three years' service, ruts from three-quarters of an inch to one and one-half inches deep are found in several places. Contractors understand this fact, and where the guarantee is required for any long period bid appreciably higher for pavements on street car streets. In 1897 bids for asphalt pavement in Brooklyn on sixty-eight streets free from tracks averaged 0.98 per square yard and $1.26 per yard on eleven streets where the tracks were present. Few cities have kept their repair account so that this extra cost can be got at exactly, but in an article read before this society at its last session Mr. Guthrie showed that it was $0.148 on business and .047 on residence streets with street car tracks and $0.112 on business and .048 on residence streets without tracks in the city of Buffalo for asphalt pavement.

—State of Repairs.—

The condition in which a pavement is kept as to repairs is of vital importance. If holes, depressions or other defects are allowed to remain for any length of time the material is abnormally worn and blocks rounded off to an amount probably four or five times what they would have been had they been in their normal position. Few officials who have the maintenance of pavements in charge appreciate this, but should they examine granite blocks or bricks that have been loosely paved in a trench and allowed to remain there for some time sustaining their usual amount of travel they will surely be convinced. If this be true of the hard block pavements, how much more so is it of such materials as macadam and asphalt. Watch a small hole in either of these pavements and see how rapidly it increases under traffic if it receive no attention, and how much more it costs to repair it after a few weeks of neglect, and it will be seen how rapidly neglect in this respect tends toward the economic end of any pavement, but particularly one of asphalt or macadam.

—Cleanliness.—

At first thought it may seem that this does not have much to do with the action of traffic, but a little reflection will soon dissipate that idea. When a pavement is clean the wheels and the horses' hoofs bear distinctly on the paving material, and it must sustain the entire friction, and its reaction wears out the pavement. If, on the other hand, it be covered with a cushion of dirt, the pavement acts principally as a foundation. The author once inspected a brick pavement said to have been down five years, and to be in as good condition as when laid. It was in a small town where the streets were seldom cleaned and an inch or more of street refuse had to be scraped off before the surface could be seen. An advocate of a particular brick for paving purposes in describing a pavement of it which he had recently examined, naively said, "When I dug down to it I found it just as good as it ever was."

It is said that when the Forum Trajanum was cleaned by the French in 1813 the ancient Roman pavements were found in good condition under some twelve feet of rubbish. While this is probably an extreme case, it is very likely that a modern pavement of imperishable material would have a long life under such conditions. At the last meeting of the National Brickmakers' Association, when the question of how to minimize the noise of a brick pavement was being discussed, a member arose and gravely asked if our cities did not keep our streets too clean; if brick pavements would not last longer and make less noise if a cushion of dirt was allowed to remain on them. Although the question was answered in the affirmative, it was decided that officials in large cities would keep the streets clean even at the expense of brick pavements. Asphalt and wood, on the contrary, should be kept clean in order to add to their durability, as rubbish of any kind collects moisture and so hastens the decay of these two materials.

The action of the atmosphere is shown under the examples given of the life of several wood pavements.

Having now somewhat hastily discussed the different influences that modify the action of traffic, it will be in order to take up the different kinds of pavements, and from representative examples deduce a general conclusion as to how long a certain pavement ought to last under different conditions:

—Granite Pavements.—

It has already been stated that the foundation of a pavement affects its durability very much. Granite blocks are generally laid in two ways, viz.: On a concrete base with joints filled with tar and gravel, and on a sand cushion with sand joints. The resulting pavements must be considered as being in separate classes. The reason why the same granite wears out more quickly when laid on sand is because the blocks follow any inequalities in the foundation and the sand in the joints is often washed out and allows more or less water to percolate down to the foundation, causing unequal settlements. All of these actions affect the stability of the blocks and often cause their displacement, thus preventing the traffic from being applied in accordance with the principle previously laid down, i. e., vertically upon the face of the block, and the result is abnormal wear. Probably the best example of a first-class granite pavement is that upon the approaches of the New York and Brooklyn suspension bridge. This was thrown open to traffic in May, 1883, and consequently has been in use about sixteen and a half years. During this time it has been subjected to a severe and continuous traffic. The roadway is sixteen feet wide. The dimensions of the blocks are 3 to 4 inches wide by 8 to 9 inches deep and 9 to 14 inches long. These were laid on a concrete base and a two-inch sand cushion, with three-fourths inch joints between courses. These joints were partially filled with tar and gravel, which was thoroughly consolidated with a calking iron driven home by a heavy hammer when the joint was refilled as before. This pavement has received practically no repairs up to the present time, and Mr. Martin, engineer of the bridge, estimates its further life of ten years, or twenty-six years in all, for a pavement that probably sustains a heavier tonnage per foot of roadway than any street in this country. An article in the Electric Engineering Magazine states that on streets near the docks in Liverpool, where the traffic was 360,000 tons per yard of width per annum, the average wear was .02 of an inch per annum. In Leith, Scotland, the repairs to granite are nil for the first ten years, and from that time to twenty-five years an average of 4 cents per yard per year. In Brooklyn, Clinton street was paved with granite on a sand foundation about twenty-three years ago. This is a residental street, and has a moderate though not a heavy traffic, has received absolutely no repairs, and is in such a condition to-day that from eight to ten years further wear may be expected of it. The authorities of the following foreign cities give us the life of granite pavement: Paris, Liverpool and Edinburgh, thirty years each, and Glasgow as high as fifty years. Engineers of the United States do not as a rule assign so long a life, and it is doubtful if our granite is as durable as that used in Europe, so that it is reasonable to suppose that their pavements will last longer despite their greater traffic. It would seem fair then to estimate the life of a granite pavement on concrete with tar and gravel joints at twenty-five years and on a sand base at twenty years.

—Wood Block Pavements.—

It is extremely difficult to generalize upon the life of a wood pavement. It is laid of so many different varieties of material, and in so many different ways as to foundation and joint filling, and with such varied chemical treatment that a conclusion in one case will hardly have an application in another. For instance, the ordinary cedar block pavement as laid in Chicago and other Western cities, requires replacing about every seven years. A similar cypress block pavement laid in Omaha in 1888 was taken up in 1892 and replaced with brick. Nicholson pavement laid in Brooklyn in 1869 had an average life of about six years, and in St. Louis of six years and three months. A hemlock pavement was laid in Philadelphia as early as 1839, and was renewed in four years. Wood wore as follows in London: On Sloane street, .065 of an inch, traffic, 297 tons per yard of width per day; on Fleet street, .456 of an inch, traffic, 1,360 tons per yard per day; on London bridge, King William street, the blocks wore 2⅝ inches in three years and two months, where the traffic was 1,200 vehicles per yard for twelve hours. Mr. Haywood made th general statement that wooden pavements wore from .2 to .3 of an inch per year under a traffic of from 300 to 600 vehicles per yard for twelve hours. The Place de Concorde, Paris, was paved with wood in 1885 and relaid in 1895. The average annual wear of nine different streets was .1357 inch, the variation being from .0746 to .2908 inch.

Wood of the eucalyptus family has been used very successfully in Australia. It was first laid in 1860, and in a paper written by Mr. W. A. Smith, M. Inst. C. E., in 1894, many interesting facts are found. The blocks, three inches wide by six inches deep and nine inches long, were first dipped in tar and laid on concrete. The first pavements were laid with one-inch joints filled with stone screenings or bituminous matter, but experience demonstrated that better results could be obtained with close joints except on steep grades. Mr. Smith states that on taking up a portion of a pavement laid with ⅜-inch joints filled with Portland cement grout, which had been down six years, dry rot had set in wherever the cement had touched the blocks, while on another street, where the joints had been filled with a mixture of tar and basalt screenings, the wood was found to be perfectly sound; and, although it had been in use eight years, it was practically as good as when laid, and the greatest wear observable was 1-16-inch under a daily traffic of 25.000 tons. On another street the blocks had worn 9-16-inch in thirteeen years.

Mr. Smith estimates that Australian hardwood will last twenty-one years in a pavement and sustain a daily traffic of 1,200 tons per yard of width.

Mr. George W. Bell, formerly United States consul to Sydney, N. S. W., states that after eleven years several blocks taken from George street had worn less than ½-inch. The roadway of this street is forty-eight feet wide, and is subjected to heavy traffic. Mr. Bell estimates the life of the pavement at twenty years.

In 1895 a pavement was laid of Australian harri karri wood on Twentieth street, between Broadway and Fifth avenue, New York city. The blocks were as above described, and, after having their lower half dipped in hot tar, were placed closely together on a concrete base, an open joint one inch wide being left at the curb for expansion. The joint was afterward filled with asphalt. At the present time there are very few blocks on this street that show signs of decay, but, as a whole, where untouched by the plumber, the pavement is in as good condition as when laid.

In European cities the duration of wooden pavements is: Paris, 8 years; Liverpool, 15 to 18 years; Glasgow, 6 years; Edinburgh, redwood 8 years and Australian wood 15 years, and London, 5 to 8 years for Baltic deal and 12 years for Australian.

The Tenth street viaduct in Omaha was paved with sawed cypress blocks in 1890. An inspector was sent South when the blocks were purchased, who carefully examined all lumber before it was sawed, so that none but the best would be used. This pavement lasted nine years. From the above figures it will be seen how impossible it is to deduct a positive result. But it does seem justifiable to conclude that a wood pavement that requires renewing in this country in less than fifteen years should never be laid.

—Asphalt Pavements.—

This material has now been in general use in this country for about sixteen years. It has been laid under very different conditions, often by inexperienced workmen and on varied foundations, so that sufficient data has not been collected to give conclusive results. Many pavements have failed in attempting to economize by utilizing old material on the street. This has often been fatal economy, as asphalt depends entirely upon its base, the asphalt itself being only the carpet laid upon the foundation floor beneath. When the floor breaks the carpet must fail.

The following tables have been compiled from statistics from Washington, Buffalo, Cincinnati and Omaha, showing the cost of asphalt repairs under certain conditions in an attempt to ascertain when the economic end of an asphalt pavement comes. Before considering them it should be stated how the repairs were paid for and the tables were made up. Washington pays a price in bulk for material used; in 1897 it was for skimming or heater work, 95 cents per cubic foot, and, where the old material is entirely removed, for wearing surface 52 cents and binder 30 cents per cubic foot, measured in the carts. Buffalo pays per square yard for actual work performed; the price in 1897 being for skimming 98 cents and for resurfacing $1.46 while in 1898 it had fallen to $0.64 and $1.05, respectively. Cincinnati paid a lump sum per year for the first and second five years after expiration of guarantee averaging .07½ cents per yard for the first and 14 cents for the second period over the entire area. The contract for the second period is still in force. When the original guarantee expired in Omaha, in 1896, a contract was entered into with the asphalt company to keep all the streets paved at that time in repair for ten years at a cost of 8 cents per yard per year.

Here are four different systems of making repairs. It will be readily seen that in deciding what it will cost to repair a pavement five, or, as was the case in Omaha, ten years in the future, at a time, too, when no asphalt pavement had been down fifteen years, any company must make a guess at the cost, and that the guess will be made on the safe side.

Table No. 1 shows the average annual cost per yard for asphalt repairs after the expiration of guarantee at the end of different periods.

Table No. 2 shows the average cost per yard for each year after guarantee has expired, the figures being compiled from the reports of 1897 for Washington and Buffalo and from personal observation for Cincinnati and Omaha.

—Table No. 1.—

Year Out of Guarantee.	Washington.	Buffalo.	Cincinnati.	Omaha.
1	.000417	.0132	.075	.08
2	.00159	.0234	.075	.08
3	....	.0229	.075	.08
4	....	.0391	.075	.08
5	.0071	.0521	.075	.08
6	.0143	.0916	.0858	.08
7	.03616	.0749	.0936	.08
8	.04518	.0502	.0994	.08
9	.04421	.0691	.1039	.08
10	.04815	.0219	.1075	.08
11	.03816	.0200	.....	.0754
12	.02318	.0280	.....	.....
13	.0747	.0415	.....	.....
14	.1223	.....	.....	.....
15	.0773	.....	.....	.....
16	....	.....	.....	.....
17	.0241	.....	.....	.....

—Table No. 2.—

Year Out of Guarantee.	Washington.	Buffalo.	Cincinnati.	Omaha.
1	.0039	.029	.075	.08
2	.0074	.057	.075	.08
3	.045	.051	.075	.08
4	.034	.095	.075	.08
5	.054	.074	.075	.08
6	.057	.084	.140	.08
7	.068	.056	.140	.08
8	.086	.042	.140	.08
9	.072	.027	.140	.08
10	.080	.031	.140	.08
11	.035	.140	....	.03
12	.031	.040	....	...
13	.033	.106	....	...
14	.026	....	....	...
15	.025	....	....	...
16	.128	....	....	...
17	.031	....	....	...

The guarantee in every case is five years, except for the streets paved in Buffalo in 1886, when it was eight years. Applying now the formula presented for ascertaining the economic end of a pavement, it will be seen that Cincinnati has about reached the limit where new pavements are required. As a matter of fact, this 14 cents being an average, several streets have probably passed the point where it is profitable to repair them. Omaha's price being the same for the whole time gives no information, but with the exception of the thirteenth year after laying in Buffalo and the twenty-first in Washington, none of the others seem to be suffering from use or time. It will be noted, however, that about midway in the record of the last two cities are four or five years where the cost appreciably exceeds those immediately before and after them. This probably means that the repairs on some streets were abnormally high during those years. It must be remembered also that, while these figures represent cost, they do not necessarily indicate the relative amount of work done, as the reduced price per yard in Buffalo for 1898 over 1897 would allow about 40 per cent. more resurfacing to be done without increasing the cost.

No arbitrary life, then, can be assigned to an asphalt pavement. Paris allows 15 years, Liverpool 12, and Edinburgh from 12 to 15 years.

In Leith, Scotland, one asphalt street averaged 5 cents per yard annually for fifteen years succeeding the third year after it was laid.

The author, in the light of figures herein given, would consider that in the United States an asphalt pavement, properly laid and maintained, should last from 15 to 20 years under average conditions.

Since this paper has been written the report of the Board of Public Works of Buffalo for 1898 has been received. This shows the average cost per yard of all asphalt maintained in Buffalo during the last four years to be, 1895, $0.067; 1896, $0.0439; 1897, $0.0480; 1898, $0.0268. These, it must be rememberered, are averages. The engineer, in the same report, submits a list of 27 streets which he recommends for resurfacing, as they have cost a total of from $0.2234 to $1.20 per yard for the last four years. Only 2¾ per cent. of the entire pavement under maintenance was repaired in 1898, as against 5½ per cent. in 1895.

BRICK PAVEMENTS.

As at present laid, brick pavements have not been in use long enough in this country to enable one to make anything more than an estimate of their probable life. The early pavements were laid in small cities where the travel was light and where the streets were not kept clean. On the other hand, the bricks, as compared to those of the present time, were poor and poorly laid. A brick was too often considered to be a brick and one as good as another. Many experiments were tried with foundations, sizes, and material for joint filling, and even now these items are not at all satisfactorily settled. It is generally considered by engineers that sand is the poorest filler, yet Mr. Cappelen, the city engineer of Minneapolis, states in his report of 1898 that when that city asked for bids for furnishing brick for the city's use with a fifteen-year guarantee, and allowing the manufacturerers to state their preferences for a joint filler, one firm preferred sand for that purpose, and refused to guarantee its brick more than five years unless sand was used.

Many of the early pavements were very durable. One in Bloomington, Ill., laid in 1875, was removed in 1894, when the bricks were worn off ¾-inch. Another, at Charleston, W. Va., lasted still longer. Many others failed quickly on account of poor material being used and bad construction. The paving brick to-day are very different from those of twenty years ago, and they are laid much more intelligently. In his report for 1897 the city engineer of Des Moines estimates the life of a brick pavement in that city to be from 12 to 15 years on a business street, and from 25 to 30 years on a residential street. The city engineer of Peoria, Ill., estimates the life of a brick pavement at 25 years, and the engineer of Bloomington, Ill., at from 15 to 20 years. The superintendent of the water works at Steubenville, O., writes that the first brick pavement was laid in 1884, is in good repair at the present time and will last ten years longer without repairs.

In 1895 Nevins street, in Brooklyn, was paved 22 feet wide with Metropolitan blocks from Canton, O. The street has a moderately heavy and continuous traffic. During the present summer the brick was measured in the center of the street, and, except in a few cases, there was no perceptible loss. It seems safe to predict for this pavement a life of from 10 to 12 years, despite the traffic. In a residential portion of the city it would surely last 50 per cent. longer.

Philadelphia, where there is probably more miles of brick pavement than in any other city in the world, estimates its life at ten years. The author, however, thinks he is conservative in assigning it a duration of fifteen years when the brick are well vitrified and properly laid.

MACADAM PAVEMENTS.

Macadam pavement can be truly said to have no end, if properly cared for, but it requires an almost constant infusion of the elixir of repairs to bring about this eternal life. The exact amount depends upon the traffic and character of the stone, varying greatly in different States. Nashville, Tenn., renews some of her streets twice in one year. One technical journal states that a street in St. Louis has had enough broken stone spread upon it to raise its surface twenty-two feet. In 1884, in London, macadam on Parliament street cost $0.70; on Whitehall street, $0.71, and on Victoria street, $0.50 per yard for repairs. Glasgow maintains her macadam streets at an annual cost of $0.12 per yard, while Paris, in 1893, paid $0.44 for the same purpose. The author will not attempt to assign a limit for macadam.

In summing up the conclusion arrived at in this paper it must be borne in mind that the results are very general, subject to many modifications, but based upon good material being laid in a proper manner and each pavement under conditions fairly favorable to its use.

The estimated life then is, for granite, on concrete, 25 years; on sand, 20 years. Brick, 15 years. Wood, 10 to 15 years. Asphalt, 18 years.

Proprietor to foreman: "Why are not the men striking?"
Foreman to proprietor: "Because the men are on a strike."

BY THE LIGHT OF THE KILN FIRE

"NEVER TOLD YOU, did I, about how I got discharged for tending strictly to my own business."

"Well, 'twas this way. I was at work in a yard, along the side of which, and elevated ten feet above us, ran a new line of railroad. I was a young fellow, on whom the heavy work of the brickyard fell heavily, and when we got a kiln ready to fire, to ease up on me, they set me to watch the kiln alone the first night. My employer was a man whose temper was as violent as a dynamite explosion, and we all were more or less afraid of his outbursts." "You sit up at this kiln to-night," he said to me, "and you keep a small blaze going in each arch until morning. Don't go to work thinking you're going to sit around and snooze either. I'll have no sleeping on watch on my kilns, if I have to discharge the whole crew."

So I went to work. There were eighteen arches, and the fuel had all been handed along within easy reach. I suppose I went around that kiln fifty times that night, alert and watchful, keeping an even blaze in each arch, and gradually working the flame in further into the kiln. As the night wore along toward morning I was congratulating myself on the success of my night's efforts and imagining to myself the satisfied grunt of my employer when he would arrive and note my fruitful following of his commands. Along in the darkest hour before dawn a fast express rushed past the yard with a roar intermingled with a noise like the falling of hail. Come to think of it afterwards, it was a strange sound, but I was too busy at the time with the kiln to give it any attention. Well, the old man arrived shortly after daylight, and walked around the kiln. I heard the satisfied grunt, exactly like a great hog aroused at the sound of his coming breakfast, and with a heart glowing with satisfaction I began to dress up the arches. The old man walked up toward the machines with his hands behind his back, and I had scarcely finished filling the first head when a snort and a roar from the direction of the machine startled me. "Come here, you," yelled the old man, and, trembling with a vague fear of impending evil, I complied. The old man pointed with an anger shaken finger at the batch of work turned out by the strikers the previous day. They were stuck full of pebbles and stones as big as your fist, as a well-made plum pudding is full of plums. They were literally peppered with stones and knocked completely out of shape, while the yard all about was covered with them. Not only that, but the treads from which the day's striking was to be done were filled with stones, and the bank from which the succeeding treads were to be filled was well besprinkled with them. It certainly had rained stones during the night, but the mystery of it was that while it showered heavily on the soft brick, not a stone had fallen on the kiln. The old man snorted, then turned as if gasping for breath, and opened up and gave me the worst tongue lashing I had ever got, winding up with driving me off the yard, followed up by the threat that if I ever showed up there again I would fall immediately heir to the worst trouble that ever came any man's way. My blame? No. But the old man said I must have slept or I would have been able to explain just when and how the shower of gravel struck the yard, and that I could not do, though I had remained thoroughly awake all night.

I was a great mystery for a day or two, but some railroad section men at work ballasting the roadbed solved it. It seems that on the day previous to my watch at the kiln they had been at work ballasting that part of the track near the yard. Their plan of work was to dump the gravel in the center of the track in even piles, and as the engine of the gravel train passed over it the cowcatcher leveled these piles down. Afterwards the crew on the "lift" were to come along and work the gravel under the ties. But the "lift" didn't get along to the yard that day. They reckoned, however, that as their engine passed over it all right that any other engine would. Texas Jack, engineer of the fast express, felt his engine scrape as he rounded the curve near the brickyard in the dark that night, and, divining the cause (and Texas Jack was a dare devil anyway), opened the throttle to its fullest extent and shot through the gravel like a streak, sending rocks and dirt in a veritable shower to both sides of the track. The old man sued the railroad company, and recovered $100 for his loss, but I never recovered my lost reputation with him. Nothing would ever make him believe that I was not a sleeper, and most assuredly I am not one, though at odd intervals I am, THE DREAMER.

A FINE BRICK PLANT—GREAT WATER CURE—A GOOD PLACE FOR BRICKMAKERS TO VISIT.

SOME THIRTY MILES southwest of Indianapolis, on the Vincennes branch of the Pennsylvania system, is the thriving little Hoosier city of Martinsville, which is fast gaining wide renown as a water cure. From the prolific bosom of Mother Earth is here drawn an inexhaustible supply of mineral water that has proven to be a sovereign cure for rheumatism. Those afflicted with that pain-racking disease gather there from all quarters—every train brings its quota of sufferers. Some come on litters borne tenderfully by friends or attendants, others hobbling on crutches, all with wan pinched faces, telling of sleepless nights on beds of pain. But after a few days or weeks sojourn, according to the severity of the case, nearly all are able to discard all these helps and smilingly take up their bed, as it were, and walk to the station with a new lease of life. There are now five sanitariums within a short distance of the station, and all of them are well filled most of the time.

Martinsville enjoys the reputation of being the most enterprising little town in Hoosierdom. It was among the first of the small cities in the West to have an electric power plant. It has a good water system, furnishing ample protection from fire. Its streets are lighted by electricity, and in the near future it expects to have a trolley line to the State capital, and recently has inaugerated a free postal delivery.

—J. C. Adams, Brickmaker to the President.—

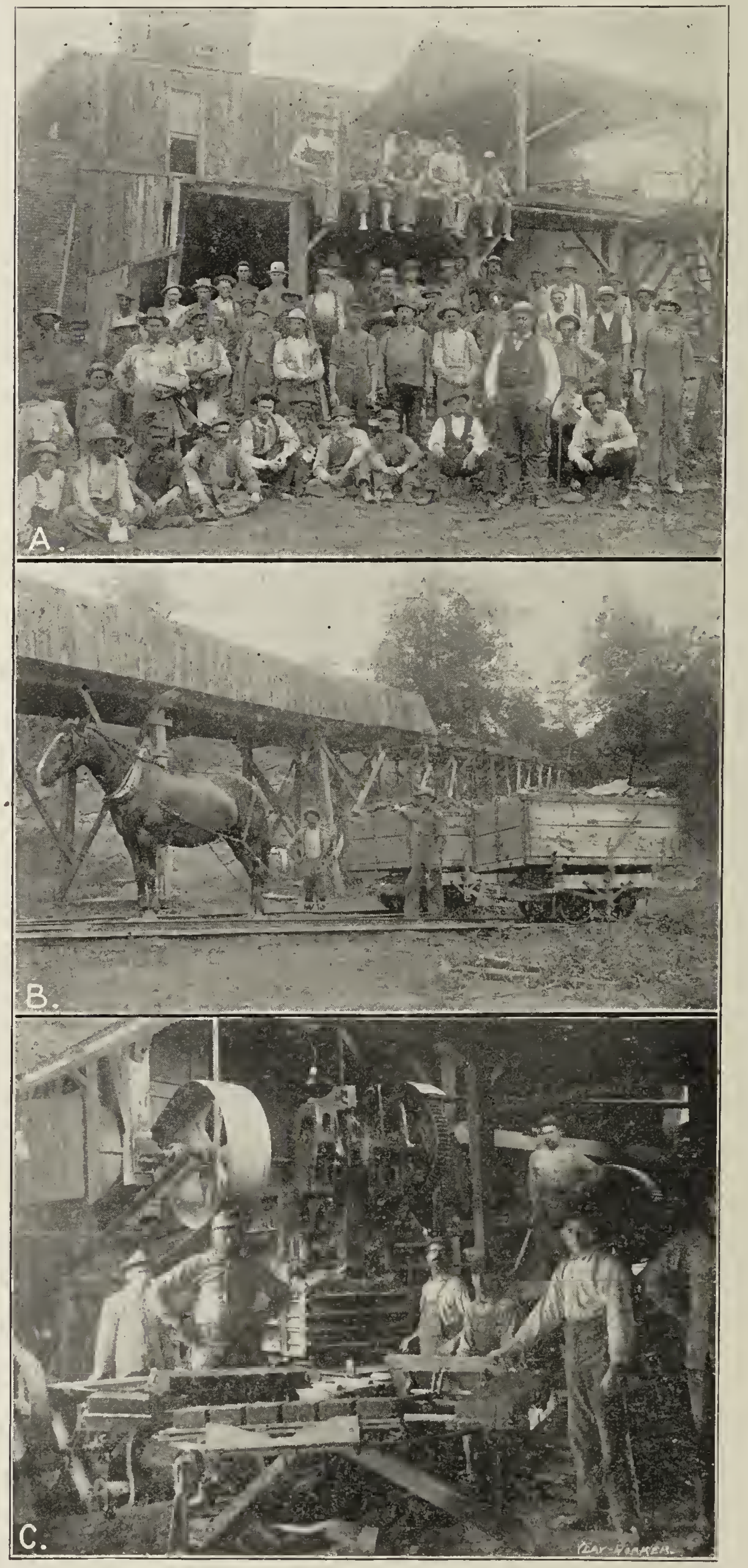
What we want to tell our readers about, though, is her up-to-date brick plant, erected two years ago by the Adams Brick Co., the dominant spirit of which is J. C. Adams, known to the members of the N. B. M. A. as the brickmaker to the President, a title bestowed on him early in the history of the National Association by B. W. Blair, of Cincinnati, who at the time remarked that as they in the old country have shoemakers to the Queen, and tailors to the King, we of the National Association have a brickmaker to the President, referring to the fact that Mr. Adams had furnished President Harrison with the brick for his residence.

The brickmaker to the President needs no introduction to our readers. His rotund figure has been conspicuous at every National Convention but one, when he was prevented from attending by his official duties as speaker of the House of Representatives in the Indiana Legislature. Perhaps no individual brickmaker in the United States is more widely known, and here at home he is a power in business and political centers. He was but recently president of the Indianapolis Board of Trade, the chief commercial organization of the State, and there are some who think he may yet occupy the Governor's chair, a position which his business experience and splendid native ability will enable him to fill ably.

He is a born and bred brickmaker, and in answer to the question, "How long have you been a brickmaker?" can answer as did a Baltimorean recently, "Three generations," his father and father's father having been brickmakers before him. For many years he made brick by hand, and there are now dotted over the Hoosier capital many fine structures built of his hand molded sand faced brick, which compare favorably in the wall with the best pressed brick. He was the first to build a machine yard in central Indiana, having established the Sheridan brick works, near the town by that name, in 1892. He sold his interest in that plant in 1895, and for a time thought of retiring from the business, but it was too fascinating for him, so in 1897 he purchased fifty acres of land near Martinsville and proceeded to erect

—A Thoroughly Modern Soft Clay Brick Plant,—

Which we recently visited in company with Mr. Adams and



A. The Men Behind the Brick Machine. B. Hauling in the Shale. The Clay Comes over the Tramway Above. C. The Machine Room and Machine Crew.

F. The Discharge End of the Standard Dryer.

G. A Birds Eye View of Works taken from Top of Hill.

Robert Elliott, the genial President of The Standard Dry Kiln Co. The plant is fortunately located in many ways. Only half a mile from the center of the town, they have the advantage of an ample water supply, which affords protection in case of fire and cuts down the insurance rate. There are four water plugs at different points on the yard to which hose can be attached at a moment's notice. There is sufficient pressure to throw a good stream of water over any of the buildings. The plant is also lighted by electricity, so that in case of a rush they can work both night and day.

The supply of raw material is inexhaustible. The top clay varies from six to eight feet in depth, and below this is a fine deposit of hard shale one hundred feet or more in depth. At present they are using the clay and the shale together, mixing in the proportion of two-thirds of shale and one-third clay. The clay is brought from the top of the hill in bottom dump cars, and the shale is blasted from the face of the bank with dynamite and hauled in side dump cars containing about sixty-four cubic feet, or sufficient to make a thousand brick. It is passed through a dry pan and elevated and passed into a Potts disintegrator. The clay is shoveled into the same machine at the same time, so that the two materials are thoroughly mixed before passing into a Potts All Iron Horizontal Stock brick machine which molds the brick very stiff at the rate of 5,000 an hour. Mr. Adams has used three of the Potts machines and has always found them entirely satisfactory.

From the machine the brick are placed on lath pallets and stacked on iron cars holding 432 brick, and run into an eleven tunnel Standard dryer. The tunnels are 116 feet long, and the dryer when filled holds about 80,000 brick. The brick are dried slowly to avoid checking. They are kept in the dryer forty-eight hours and come out bone dry. We examined a number of cars as they were taken out of the dryer, but did not find a single checked or broken brick. "Drying is the easiest part of our work now," said the foreman, Mr. Robert Davis, who has been in Mr. Adam's employ for thirty-five years. "The dryer gives us no trouble whatever, but does its work without a hitch or drawback of any sort. Compared with the old outdoor system, it is an actual boon; there are no more night calls for men to cover brick, or early morning trips to the yard to find thousands of washed and wasted brick scattered over the drying ground, to say nothing of the advantage of being able to run right through the winter if desired."

The brick are burned in square up-draft kilns, of which they have six, two Wingards and four Swifts, the latter equipped with Swift's coking table furnace, with which Mr. Adams is much pleased. So much so, that as soon as he can find an opportunity he proposes to change the Wingard kilns to the Swift system. The entire process of burning is a decided improvement over the old methods, producing all hard burned brick at a much lower expense for fuel. A common grade of Indiana bituminous slack is used, both for water smoking and burning. It comes from the Linton district, some fifty miles southwest on the Vincennes road, and costs about $1.00 a ton at the kilns. The Swift process is not only more economical, but it involves much less labor, the kilns almost water smoke themselves. To begin with a few live coals are placed on the slab or coking table and covered with

Mr. Robt. Elliott Looks before He—Wheels the Brick.

J. C. Adams explains the Merits of the Lath Pallet.

Supt. Davis agrees with the Boss.

slack, and left undisturbed for twenty-four hours. Then another charge of slack is added, and there is another wait of twelve hours. By that time a good heat has been generated and the water smoke begins to leave the heads. From that time on the fires are increased until the flames issue through the top of the kiln. The fires are then pushed vigorously until the settle is satisfactory, averaging about twelve inches. All told, they burn in from fourteen to sixteen days. They could hurry it up and shorten the time a day or two, but the results would not be so satisfactory. The brick are set forty or forty-two high, the kilns being thirty-six brick wide, with four brick benches, eighteen arches to kiln, giving a capacity of nearly 400,000 per kiln. The brick are set three over three except in the center, where they are blocked for face brick.

From the kilns the brick are wheeled to the cars. A platform the height of an ordinary flat car extends along past the end of the kilns, so that the brick may be easily loaded into the cars, and the work of loading by barrows is thus minimized. There are but few waste brick, and these are ground up in the dry pan and mixed with the sand for molding purposes, giving the brick a fine dark red color. The grinding of the bats is usually done at night, the night watchman superintending the work.

The entire plant is compact and well arranged, the clay going on the down grade from the time it is first handled until the brick are in the car. In laying out the plant Mr. Adams was assisted by Albert Potts, of C. & A. Potts & Co., whose extensive experience in building brick plants made him a wise adviser. Mr. Adams is fortunate in having in his employ an all around mechanic, who not only serves as assistant engineer, but makes clay carts and other appliances needed about the yard. Included in the category are the pallets, which are made of laths. The accompanying view gives an idea of their construction. They are 34 inches long and 10 inches wide. Two layers of lath are nailed over cross pieces of the same material, which forms a truss-like structure, which prevents warping. The pallets can be used either side up, and will bear rough handling.

Adams Brick Co's. Shale Bank at the Base of the Hill and the Clay Bank at the Top of the Hill.

From the time they began to make brick two years ago the demand has been fully up to the capacity of the yard. The past year the average price at the kiln has been $5.00. About one-third of the product goes to Indianapolis, and the balance to small cities south and west of Martinsville. They frequently ship 100 miles or more, both the Big Four and the Pennsylvania lines competing for the business, which insures a fair freight rate and a sufficient number of cars to handle the brick promptly.

The size of the green brick are 2⅝x4½x9½; burned they measure 2½x4x8½, a trifle larger than the standard size, but they are as small as they can make them and compete with their neighbors, some of whom make a still larger brick.

Associated with Mr. Adams is his son, Fred B. Adams, who, as secretary, looks after the office affairs. He is a worthy son of a worthy sire. As steady as a clock, he was never known to let a possible customer escape. A son-in-law, Frank W. Wood, is vice president, and bears the honors and duties of the office with becoming grace. Dividends, no matter how frequently declared, never come too fast to suit the vice president, who is of a naturally cheerful disposition, and, as the proprietor of a bicycle chain manufactory, has grown used to such things. They now contemplate putting in additional machinery, so as to double the capacity of the plant the coming season. They have a four-mold Andrus dry press, on which they have made a limited quantity of front and ornamental brick. It is a good machine, but as their kilns are not adapted to burning dry press brick, the press will probably be set out if an additional soft mud machine is put in.

They may in the future also add machinery for the manufacture of Paving brick, the shale has been tested for that pur-with very gratifying results. A good paver can be made of it. Another point of vantage in the location of the plant, is its proximity to the vast sand deposits, only five miles distant, from which most of the brickyards of the State obtain their supply of molding sand.

All connected with the plant are proud of it, and visiting brickmakers are always welcome, and if they stay long enough are sure of a good dinner at the sanitarium, with an unlimited quantity of water that, like some brands of cheese, can be recognized in the dark.

Those who journey there alone will experience no difficulty in finding the works. Just follow the railroad track, and you will soon see the unmistakable clouds of smoke that tell the experienced eye that a brickyard is nigh. The works are located at the base of a great hill, skirting which is a lovely little vale called "Happy Hollow," the legend of which we will leave for Mr. Adams to tell in his own quaint way at the coming National Convention.

Ten Miles of Advertising.

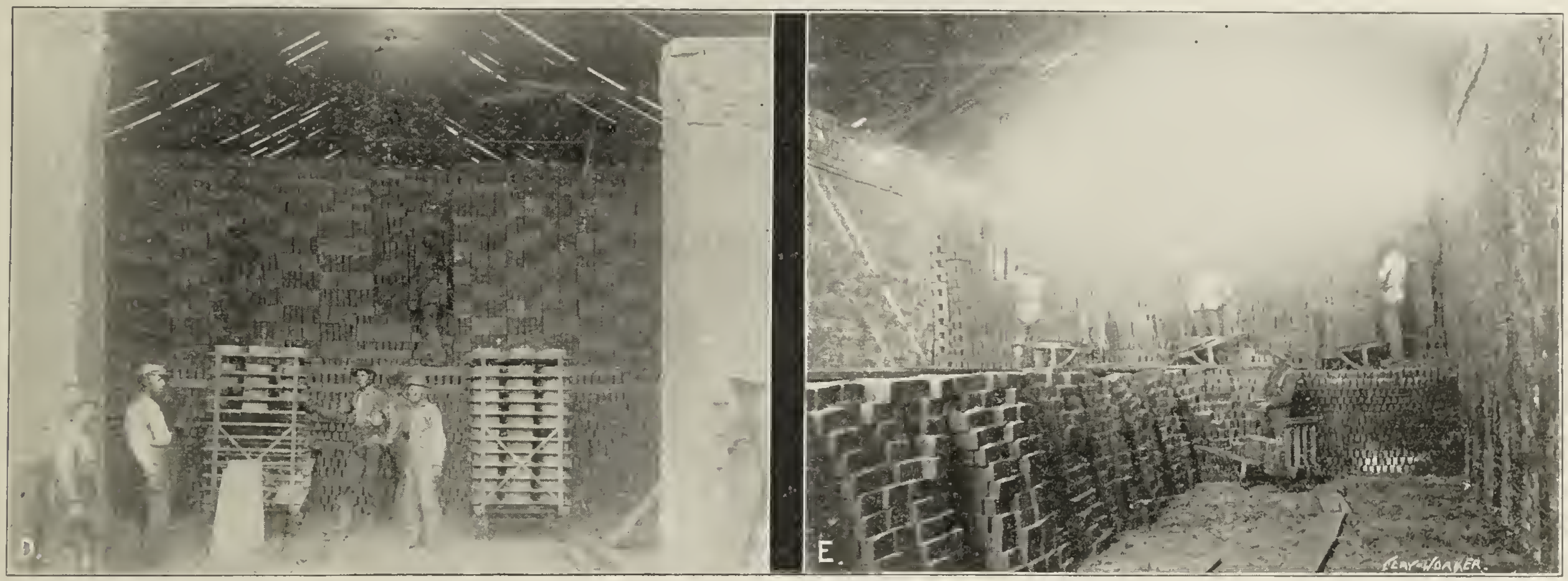
No street in the world is more plastered with advertising than Broadway, New York. Even to those recognizing that fact, the amount does not appear startling until it is put into figures. The combined length of the two sides of Broadway from the Battery to Central Park is 52,800 feet. The amount of advertising on tne buildings and in shop windows is such that it would take a man between eight and ten days of eight hours each to read his way up one side and down the other.—New York Evening Post.

Written for THE CLAY-WORKER.

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 4.

BY ALFRED CROSSLEY.

THE ORIGIN OF CLAYS, which has already been referred to, it must be confessed, is but imperfectly understood, and it is, in fact, uncertain whether all clays have had the same or a similar origin. It appears tolerably certain that clay does not exist as a primary substance, but that it has been formed from the decomposition of other substances, or, in other words, if we go far enough back in the earth's history, we find there was a time when there was no such thing as clay, just as there was a time when there was no coal. Dr. Percy says: "All clays appear to be the product of the slow decomposition of feldspar or some other similar mineral." In regard to kaolin, or China clay, this has been demonstrated, as some of the deposits show not only the clay, but also its original feldspar and likewise various stages of the decomposition between. A recent writer has the following: "Kaolin is derived from decomposition of granite, occurring in two stages, known as China clay and China stone; and granite, to go a little further back in geological order, is composed of three minerals, quartz, feldspar and mica. In the process of decomposition from granite into kaolin, the quartz, remaining unchanged, is mechanically washed away as, for instance, by the action of running water. The difference between China stone and China clay consists mainly in the softening in the latter of feldspar by conversion into clay. Kaolinizing is a term used for the process of decomposition, and is generally described as resulting from the action of carbonic acid in the atmosphere upon the silicates of potash or soda, removing them as soluble carbonates, whilst the moisture in the atmosphere unites with remaining silicates of alumina to form kaolin." While the origin of kaolin is thus pretty well established, it is perhaps not quite so certain that all other clays have had the same origin. Of course, in the absence of any positive evidence to the contrary, that theory may be so far accepted as being possibly correct. In that case we may assume that the original feldspar contained many impurities which have been imparted to the resulting clay. Or a clay may have been originally pure and have gradually gathered its impurities in a long passage to the place of its final deposit, as it has been pretty well established that many beds of clay have been carried immense distances before being deposited in beds and veins, as we now find them, and in many instances this process can still be seen going on.



BRICKYARD SKETCHES.—Setting Brick in Kiln. Emptying a Kiln.

Granite, when decomposed, has yielded superior qualities of fire clay as well as kaolin, and it has also been stated that in different parts of the British Isles the dissolution of the mountain limestone has produced a highly refractory fire clay. The last quoted writer, in speaking of the different varieties of brick clays, says "they are, however, all formed by the same process of nature, being deposited either by the sea or rivers, and accordingly named marine and fluviatile deposits, respectively." This, of course, is true of sedimentary clays, but can not be correct of clays on the whole.

In "Bricks Tile and Terra Cotta," Chas. T. Davis states: "Fire clay beds are fine sediments which accumulate at the bottom of shallow pools of water, subsequently filled up with growing vegetation. The roots of aquatic plants have penetrated this clay bed and extracted generally its potash, soda, lime, iron, etc., and have removed such a percentage of silica as to leave it with a larger relative quantity of alumina than it had before being subjected to their action. In this manner they have extracted from it its more fusible or fluxing ingredients and have left it its peculiar property of remaining unchanged at a high temperature. Many beds of peat have underlying them clays very like our fire clays, and in such circumstances we may plainly see the formation of fire clays progressing." This theory is interesting and sounds very plausible, but it can hardly be said to be a formation of fire clay at all, but rather a purification of clays already formed from decomposed granite or felspathic rocks. The theory of a uniform origin of all clays is difficult to reconcile with the natural facts of the great difference in clays of what we have termed their essential constituents, viz., silica and alumina, for some clays contain a very small proportion of the former, and others just as little of the latter. The whole subject is as yet considerably in the dark, and more light on it would be very welcome, that we might perfectly understand the difference and variations in the extent, position and character of many of our fire clay deposits.

Fire clays are of three distinct classes, geologically speaking, or of three distinct formations, viz.: cretaceous, the carboniferous or coal measures, and the tertiary, which latter are divided into what are known as the eocene and miocene. Of the cretaceous, the fire clays of Amboy and Woodbridge, N. J., are notable examples. Of the carboniferous may be mentioned the celebrated Stourbridge, the Leeds, Durham and other clays of England; Dowlais of Wales, Glenboig, Garnkirk and others of Scotland; Mt. Savage, Md., Pennsylvania, Ohio, Kentucky, and several others in America. Of the tertiary, in Dorsetshire, Devonshire and Cornwall, England, some very excellent and refractory brick are said to be made from this clay. In America the South is the only section I know of where the tertiary clays are used, chiefly in Tennessee and Alabama, and also to some extent in Georgia and the Carolinas. The great bulk of the fire clay used, however, is from the coal measures, although from the larger percentage of alumina found in the tertiary class, they might have been expected to produce the most refractory brick.

Fire clays are of many colors—black, dark and light gray, blue, light green and white, both clear and deepening into a bluish or grayish tint. The flint or nonplastic clays are sometimes clear, of various shades, other times spotted, again of a dark, almost chocolate color, with veins running through, and very beautiful. The different kinds of fire clay vary so much in hardness that, while one is dug with a spade, another has to be blasted like rock.

It will now be in order to take up the question of the chemical properties of fire clay, or the elements into which an analysis usually divides them, and the influence relative of these elements on each other or on the fire clay as a whole. The elements usually found in fire clays are silica, alumina, oxide of iron, carbonates of lime and magnesia, soda, potash, and water, both hygroscopic and combined. Besides these are sometimes found oxide of manganese, sulphuric acid, tetanic acid, organic matter, etc. The first named, however, are those which are most important to be considered. Of the constituents named, the only essential ones are silica, alumina and water. The others are extraneous. In the consideration of this part of the subject it is proper to remark that on the correct proportions of the above elements and their actual influences on each other, much difference of opinion exists among different writers on the subject, though, as I have mentioned previously, it is pretty generally agreed among chemists that pure clay, of the composition shown in the table given, is the most refractory. Of course, it is understood that the clay, when prepared for use in the arts and manufactures, in the form of fire brick, has been hydrated or deprived of its water, the first form being driven off by drying and the second by burning. The elements of value then remaining are silica and alumina. These, either separately or united in any proportion, are practically infusible at any temperature required in the arts. While this is undoubtedly true, there are other things to be considered in connection with it, or we may be led into serious error. If a clay could be obtained containing (after burning, of course) these two elements alone, and could be used without coming in contact with basic slags or molten metals, then it would probably be true that their proportions were immaterial. But, as these conditions cannot be complied with, the truth is, in actual practice, as tersely stated by one writer, that "clays are refractory in proportion to their basic character—that is, to the alumina which they contain, and are less useful as fire clays as they become acid (silicious) in their character." The reason for this is that silica, although of itself extremely refractory, readily combines with the oxide of iron, alkalies and other impurities, to form fusible silicates. A familiar example of this is in common glass, made from silica and soda or potash, which requires but a comparatively low heat to melt it. Besides its great refractoriness, silica possesses another property which makes it valuable in a fire clay, viz.: that when exposed to intense heat it expands, and thus neutralizes the opposite property in alumina of excessive contraction. In speaking of silica it is necessary to remember the difference between free and combined silica. Silica, in the language of the chemist, is an acid, and will combine with other elements as bases to form silicates. Hence there are silicates of alumina, lime, magnesia, baryta, potash, soda, etc., all of which are fusible at certain temperatures, and while the temperature in some of them is so high as to be practically infusible, others are easily melted. It is the silicate of alumina that at present interests us, or, in one word, clay. Clay is said to consist essentially of the two particular elements mentioned, silica and alumina, whereas it would be really more correct to say that clay is the name given to a substance produced by a chemical combination (not a mere mixture) of these two elements, viz.: silicate of alumina above mentioned. It is a common thing in the laboratory of nature for two or more elements to combine to form a distinct new substance. A common illustration of this is in the air we breathe, and another is in water. The first of these is produced by the combination of two distinct gases, oxygen and nitrogen, and the latter, hydrogen and oxygen. We might take pure alumina and pure silica and mix them together, but however thoroughly we did this we should have only a mechanical admixture of these two elements—no silicate of alumina or clay would have been produced. In a former part of this article I may have fallen into the common error here alluded to of speaking of these as two distinct elements, but I have now given what would seem to be the more correct view. I have also referred previously to the expression used by an able writer to the effect that clay and alumina were synonymous, but I think that on more mature reflection he would have agreed that alumina is not clay, but that silicate of alumina is.

Fire clay nearly always contains more or less free silica. In this form it is not usually an advantage, but rather the reverse. I am aware that the contrary opinion has been expressed, and by more distinguished writers. Says one: "There should be a perfect understanding of the difference between combined and free silica. In speaking of the composition of fire clays, the first, as has been stated, will melt in very high heats in proportion to the percentage of combination, but clean, free silica, (i. e. in crystals) will not melt in our melting heats unless fluxed, consequently a high proportion of free silica, in absence of a high percentage of the fluxes, is not nearly so injurious as when the silica is combined." I extract the following from another writer, a State chemist and professor of chemistry: "The tertiary clays contain much more silica and less alumina than those of the coal measures, and much of this silica is in the form of fine sand. This causes the tertiary clays to be less plastic and adhesive than those of the coal measures, but probably may cause them to be more refractory in the fire." Again: "The admixture of fine sand does not sensibly reduce its (silicate of alumina) refractory character, provided it is free from fluxing materials." I am prepared to agree with these writers so far, that free silica in a clay will not detract from its refractoriness, provided it is pure and not associated with fluxing agents. But what is the use of assuming a condition that so rarely exists? For, in the first place, a great many fire clays contain in themselves fluxing elements in sufficient proportion to form dangerous combinations with the free silica in high heats, and in the second place, such highly silaceous clays are restricted in their uses, as fire brick containing a large proportion of free silica, if used in furnaces, are liable to failure through combination of the free silica in the brick with the oxides of iron and other fluxing agents in the furnace; and I will agree with the first quoted writer further, that where silica is added it should preferably be in the form of crystals. But when he says, as he does also in other places, that combined silica increases the fusibility of the clay, I am sure he is grievously in error. The testimony of all writers of authority on the subject is that silicate of alumina is, for metallurgical purposes, practically infusible. Silica, when combined with alumina, has, as before stated, lost its individual character and formed a new substance, viz., silicate of alumina, in which it is very much less affected by fluxes; hence it is found that a clay in which the silica is all combined with the alumina may contain a very much larger per cent. of fluxing elements without its refractory character being impaired. On the other hand, the free silica, when present, will readily form other silicates with the lime, magnesia, soda, etc., contained in the clay, and any of these again may form a double silicate with the silicate of alumina, and completely fuse the whole under intense heat. The silicate of lime, for instance, is of itself fusible only at a very high heat, but when this combines with the silicate of alumina, thus forming what is called a double silicate, the whole fuses readily. It therefore follows that, generally speaking, for metallurgical purposes, as small a proportion of free silica as possible is desirable.

It is not precisely known how high a percentage of silica will enter into combination with the alumina, but it rarely, if ever, exceeds 50 per cent., and it is said seldom goes over 45 per cent. All over that is usually free silica, although it may be in such a fine state of subdivision as to be almost impalpable. In this condition it is most objectionable, as when in larger grains or crystals it less readily enters into hurtful combination with fluxing elements. It is said that in the case of crucibles exposed for a long time to a high temperature the free silica may gradually enter into combination with the clay, particularly if the particles are too fine. It is true that some of the most celebrated clays contain a larger percentage of silica, a considerable portion of which is necessarily free silica, but it is also true that those clays usually have but a small percentage of the fluxes. It should also be borne in mind that the refractoriness of clay depends also upon other conditions besides its composition, so that two clays of almost identical composition may differ considerably in their refractory qualities. Where resistance to the extreme heat is the only condition to be met, then an excess of silica is preferable in the clay, and hence silica in the form of crushed quartz or clean, pure, coarse sand is added. In this form it has been said to act the part of a rigid skeleton in the body of the article, particularly in the case of crucibles, which have to be grasped by tongs while at a melting heat to remove them from the furnace. The whole question, however, of free and combined silica is involved in some apparent contradictions and is open to still further elucidation.

(To be continued.)

Written for The Clay-Worker.

WHAT KILN SHALL I BUILD? No. 8.

FLOORS, FLUES AND DRAFT.

IN DUE ORDER we have reached the kiln floor as it is brought into service in the down-draft kiln. The floor of such kilns has a double function to perform. First, it must bear the weight of the wares it is designed to carry, whether of pavers or of hollow wares, and it is evident that between the two there may be a large margin for difference in construction, the weight to be carried in the one case being often three to five times that imposed in the other. The floors must be built, then, with reference to the weight they must carry, and in providing for this we need to keep in view not only the strength of the material we make use of, but the subfoundation upon which it is to rest, for a floor that will maintain its alignment is essential to the turning out of a high per cent. of first-class goods of any and every sort.

How often we see "shimming up" resorted to as a necessity in setting wares in a kiln—as a necessity to compensate for an uneven floor, and this means not only a waste of time, but is, at the best, accompanied with indifferent results.

Be sure, then, that you have a subfoundation that will sustain your floors, and, when it becomes necessary from the character of the soil, provide such a system of drainage as shall prevent in the wettest season the filling of your flues and stack with vapor that shall deaden draft, and if the soil is of an alluvial nature the injured draft is quite sure to be accompanied with an uneven settling of floor. Both are to be carefully guarded against, and subdrainage is the surest preventive. Again, the method of laying the floor, which, in our treatment of it, shall be assumed to include the entire construction above the earthy bed, may be of a widely different character, depending upon the tendency of the wares to be burned to lodge obstructing material in the flues, as, for instance, a brick that requires the use of sand to prevent them from being welded together in the burning. Goods so treated tend to fill up the flues very rapidly, and in such cases it is well to make ample provision in order to save frequent cleaning out and the tearing up and relaying of floors, accompanied always in the process of filling, as it is, with a gradual deterioration in efficiency of fuel and perfection of burn. We were, not long since, visiting works in Ohio in which for some months a very large per cent. of goods of second grade were being turned out of the kilns, rendered so in the process of burning, and necessarily marketed as second grade goods, at a discount of 20 per cent. or more from the prevailing prices for first-class goods. Commenting upon the fact with the superintendent, we were told that

"THE FLOOR FLUES NEEDED CLEANING,"

But that they were so "rushed with orders that they could not take the time to do it." We were led to resort to pencil and paper to ascertain what such a method of doing business involved in loss of dollars and cents on each kiln being burned, and with the following result: The average loss on each kiln being burned, from the cause named, was about $20, while but recently we saw the floor of such a kiln taken up and cleaned out and replaced between noon and midnight, by a gang of six men, at a cost of about $9. We have made no account of the waste of fuel which naturally accompanies such procedure, nor the loss of time, for a kiln in such condition cannot be burned as quickly as if in good order. Hence the end had in view for permitting the use of a kiln in such condition was defeated, and the costs attending the trial were charged up to the defendant.

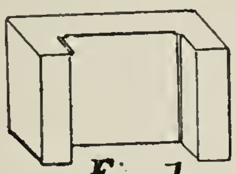


Fig. 1

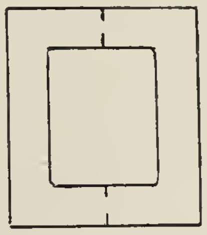


Fig. 2

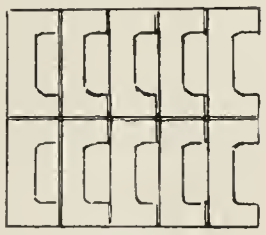


Fig. 3

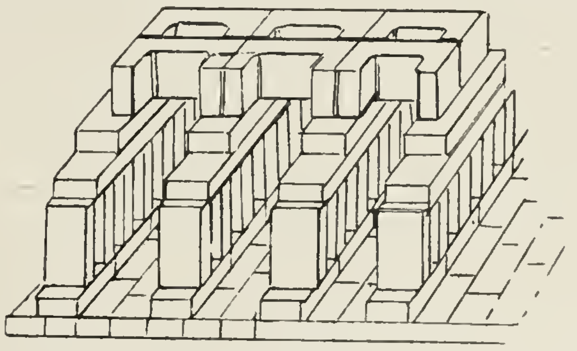


Fig. 4.

We afterwards learned that a stimulus to action in promptly remedying the matter was wanting from the fact that a neighboring competitor was, because of his slovenly habit of manufacturing similar wares, producing a large quantity of second-grade goods, and so had created a demand for them for certain inferior use. The demand having been created, our acquaintance, instead of refusing to meet the demands of what should have been considered an illegitimate trade, had allowed himself to become a

SLAUGHTERER OF HIS OWN GOODS,

On the plea that, as his competitor had created the demand, and second-grade goods were quoted in the market, he had to meet it to prevent the loss of some of his customers, who, in buying seconds of his competitor, would be likely to buy firsts also.

This illustration of the mischievous effects of slovenly work (we can give it no better characterization, unless we add insane as a further qualifying word) may be deemed aside from the subject we have in hand, and yet it has its bearings upon it, for it gives us the opportunity of emphasizing both the need of the proper construction of kiln flues with reference to the duty required, and also of taking proper care of them when so constructed.

THE SAFE RULE

To be followed in deciding upon the size of floor openings should be to make sure that when the stock to be burned is set in the kiln the uncovered openings have a somewhat larger area than that of the chimney flue.

In order to make such computation one needs first to decide how his stock shall be set in his kiln, and then lay his floor with reference to it.

There are various methods of constructing floors. One that is perhaps as well known as any may be described and illustrated as follows: The most common form of floor paver may be seen in Fig. 1. A top view is shown. These are made of heavier or lighter walls, or of greater or less depth than the dimensions given in Fig. 1, according to the duty required, and the opening made in laying may be varied to the needs of each case. Parties building a kiln may often supply their own needs if they have material sufficiently refractory for the purpose. While it is generaly considered that a fire clay brick is essential for this use, as good floors as we have ever seen have been made from shale clays, and we have thought them superior to fire clay brick in that they do not show the same disposition to wear away and disintegrate under the heavy service imposed by loading and unloading the kiln. The most economical way of producing these is on an auger or plunger machine and is a very satisfactory one. An inexpensive die is employed that molds a double block, as shown in Fig. 2. Such blocks are scored in the forming die so as to readily break apart after burning. Of course, the lessened wear from the use of a shale clay means less tendency to foul the flues, and a truer face on which to set the wares, for the wear is likely to be much greater in the center of a kiln. We know of floors made of shale pavers on which are burned vitrified street pavers, and have seen such floors in excellent condition after years of service.

It may seem hardly necessary to show how such blocks are laid, but we must not pass the elementary, assuming that our readers are all reasonably intelligent in such matters. Our purpose has been so to present details as to help the beginner, first by setting forth the general principles involved, and then the practice based upon them. In Fig. 3 we are looking down upon a section of floor laid in use of the blocks described. While in Fig. 4 we have a perspective cross-section view of a floor with supporting arches.

THE ONE ESSENTIAL

In the dimensions of the floor paver is that in length it be sufficient to reach from center to center of the brickwork upon which it rests. Nine inches is about the usual length, and this gives a clear space between the supports of about 5 inches.; this will meet the heaviest requirements such as are imposed in burning pavers, while for the burning of light wares, where a good, tough floor material can be had, the length of the floor paver may be increased to 12 inches, if desired, with a corresponding increase of width of arch formed, while the depth of the paver may be run from 5 to 6 inches. It will be seen how readily the dimensions of the opening in the paver may be regulated to meet the known or estimated requirements of any case, and here both judgment and experience are to be desired. It is better to err in providing for an excess of openings, as the correction is easy. Where it is found necessary for the purpose of equalizing the draft, solid pavers may be made use of in alternation with those which provide an opening.

Before we leave the subject of kiln floors and take up the connection and form of floor flues, it will be well to mention other forms of floors besides the one described which present good points and are successfully employed. In apparently strong contrast to the open floor stands the

CLOSE LAID FLOOR,

With its occasional openings connecting with the flues below, the openings being so located and proportioned as to secure an even distribution of heat throughout the kiln. It will be evident that such floors are not as well calculated for burning all classes of goods evenly as an open floor of the character first mentioned, and that, other things being equal, a stronger draft will be required, as the down-flowing stream of heat will be arrested and compelled to take a horizontal course to the nearest flue opening. Such floors may be said to be better adapted to the burning of brick than hollow wares like sewer pipe, tile fireproofing and hollow blocks, and the coal should be of a good, free-burning character. The friends of the close laid floor will tell you that in its use heat is arrested and utilized that would in the use of the open floor be likely to pass out of the kiln and stack before parting with the percentage of heat that should be retained; that the kiln thus becomes a veritable "pool of heat" rather than a chamber through which a current of heat is passing.

Now, while both forms of floors, with various modifications between the extremes may be found doing good work, it must, we think, be admitted that an open floor can be made by regulating the size of the openings to what experience may have proved to be best adapted to the wares to be burned, as well as to the character of the fuel used—so that the heat shall not be dismissed until it shall have parted with its full value so far as it can be made available in adding to the temperature of the wares located nearest the floor of the kiln. It must be kept in mind that

THERE IS A BALANCING POINT,

And how to equalize our desire to save and use heat with the necessity of passing enough on through our furnace to secure as nearly as possible perfect combustion is a problem well worth the patient study of the kiln owner or manager.

We have no doubt that much fuel is wasted by a too ready dismissing of heat from the kiln. Our attention was first directed to this source of heat loss and fuel waste as we listened to the paper read by Captain Williams, of Canton, before the National Brick Manufacturers' Association, at the Cleveland Convention, in 1895. We recommend its careful review to our readers.

To our mind the first point and the most important for abating this evil is at the furnace. The unnecessarily large volume of air usually admitted at such point demands a free passageway for its disposal. Reduce the volume of air admitted as nearly as posssible to the actual requirements for a free combustion and deliver it in such manner as shall insure its distribution at points where it shall seize upon its portion of the liberated carbon, and at points where there is a sufficient temperature to insure combustion, and you may proportionally reduce the area of your floor openings, flues and stack. We are perhaps repeating the lesson presented in our last paper, but then it is a new application of the principle contended for and it naturally presents itself again for our consideration as we attempt to balance and bring into proper proportion and relation flues, floor openings and furnace, and the modifications which may be made and where to suit the one to the other to insure the best results. There is still

ANOTHER ASPECT OF THE CASE

To be presented to which we invite attention, and especially the attention of those who can bring the light of experience to bear upon the subject. Our professional kiln builders may be willing to instruct us upon this point, and such thinkers, observers and writers as Professor Orton, D. W. Stookey, George Tiffany and others surely will not be found without an opinion in the matter. How we miss the trenchant pen of Wm. Waplington, of Pleasant Memory, when it comes to careful analysis of any matter relating to heat and combustion. Who can take his place in writing for the new beginner? The writer confesses to being a seeker for information on the point about to be presented and to a desire to stir up others to answer for the benefit of the readers of THE CLAY-WORKER the question which he raises.

We start out with two

GENERALLY ADMITTED FACTS.

First—That the most perfect combustion can be secured by the use of a forced draft. A recent scientific investigator and writer has placed the highest efficiency to be obtained to be a draft that should give a 1¾-inch water column, which is to say a draft having about one ounce pressure to the square inch, and that a greater pressure than this means a waste of fuel.

Second—It has come to be understood and we find it so laid down in recent text-books that the highest economy in fuel use is also to be had in connection with a forced draft vs. a natural one—that is, one created in the use of a chimney or stack.

The reasons for such conclusions will become apparent to us if we stop to consider that in the use of such blast the great surface required for the consumption of a given amout of fuel may be considerably reduced, and that a regulated minimum amount of air to insure complete combustion may be brought into contact with incandescent fuel, and so divide up in its passage through the fuel that it shall all, or practically all, be made available for the purpose of combustion. This application of

A FORCED DRAFT

May be best understood by the general reader if we call attention to it as applied for steam-making. What air is introduced is at a point under the grate and must pass through the fuel. The fuel so exposed will be found in an incandescent condition, and if any care has been used in its distribution upon the grate the air must become thoroughly divided in passing through the fuel, and must also be heated to a high degree by contact with the incandescent mass, hence it is in condition to unite with the solid carbon, and what liberated carbon is not consumed at this point is quite sure to be consumed before passing out of the heat zone directly above the fuel body. Intimate mixture of carbon and oxygen in the presence of the necessary heat, the volume of oxygen being regulated closely to the needs, this is the end sought, and the means employed as we have outlined them meet the requirement, when properly administered, and the regulation of the proper supply of oxygen is attended with such uniformity that less depends upon the judgment and skill of the fireman than attaches to ordinary firing. In such cases it will be evident that the diluting of the heat generated, by the admission of 100 per cent. more of air than is found theoretically necessary for combustion, may and should be reduced to a small fraction of that amount.

We are now ready to ask our question for practical men to answer.

Why should we not aim to so proportion our kiln furnaces to our draft that we may secure a rapid passage of air through our incandescent fuel—our flue area being such as to admit of its being discharged from the kiln at a greatly reduced speed though of double volume per minute than that attending its entry?

To make our thought clearer, we call attention to a phenomenon familiar to all which attends the use of an ordinary heating or cook stove. The stove is to us for the moment

A MINIATURE KILN.

It has, we will say, a 6-inch diameter of smoke pipe. But if we desire to secure the highest efficiency from our fuel, the brightest fire, and the most perfect combustion, we open the draft below the grate. The area of this draft damper when wide open rarely exceeds one-half that of the smoke pipe; usually not over one-third. What it lacks in area is made up by the more rapid entry of the air. The fire once started, we know that by proper treatment of the draft damper leading under the grate we get the measure of heat we desire, and the more rapid the draft the more perfect the combustion. We know further that the opening of any damper to admit heat above the fuel means a retarding of the combustion. If, then, we wish to secure the fullest value from our fuel with the least discoloration of wares, why should we not aim to apply the same principles we have found to yield best results in our daily experience as applied to stoves? We think we have not digressed from the subject in hand. We were discussing the conservation of heat. How shall we best succeed in doing this? If we have losses, is the remedy to be applied at the furnace, or at the floor and flues?

FLAME.

What to Cut Off.

Cut off the inconsequential papers, if you have to, but always keep your ad. in your best papers big enough to do you justice. It is better to convince a few people than to talk to many.—Chicago Apparel Gazette.

The first great step in life is to form rational ideas of happiness.—Exchange.

OFFICIAL ANNOUNCEMENT.

The Fourteenth Annual Convention of the National Brick Manufacturers' Association, to be Held at Detroit, Mich., February 5th to 10th, 1900.

To the Members of the N. B. M. A.:

As previously announced, it has been determined to accept the cordial invitations extended by the Governor of Michigan Mayor of Detroit, the brickmakers of that city and others, which where given in full in the previous issue of The Clay-Worker, for they tell of the advantages of Detroit as a convention city so forcefully that we are convinced no better location can be selected for our next annual convention, and we have, therefore, arranged to meet there the week of Feb. 5 to 10, 1900.

Hotel Cadillac will be headquarters and will afford every possible facility for convention work, as well as insure the very best of accommodations for all who attend, for the Cadillac is one of the most popular and best managed hotels in the United States.

In due time reduced railroad rates will be arranged for and all other details looked after and announced in the usual way. The N. B. M. A. now shares the universal prosperity, an unusual number of new members having been enrolled during the last year, and there is every reason to believe that the next convention will be the largest ever held.

Clayworkers who are not now members, but who wish to join the association and attend the Detroit meetings, are requested to write to the secretary at Indianapolis for full particulars.

The Executive Committee.

T. A. Randall, Secretary. W. D. Richardson, President.

Written for the CLAY-WORKER.

THE CLAYWORKER IN SOUTH AFRICA.— No. 2.

A GOOD CLAY COUNTRY.

THERE IS AN abundance of good clay in the Johannesburg territory, as the writer knows from personal knowledge, and it is accessible by the various railroads centering here. For this reason the absence of timber is not so serious a matter as it would otherwise be. With such large deposits of clay, and plenty of coal for fuel, there need be no lack of building material. The prices for brick near Johannesburg are at present very low, and as rail freights are very high, the prices in other parts of the country are much better. From page 455 of the British and South African Export Gazette, which lately came in, it is stated that, as for as known until now, the Transvaal possesses 37,000,000,000 tons more coal than Great Britain. We have more collieries than can find a market for the coal, yet to pay expenses until Delagoa Bay is open to coal the ships, and furnish the coaling stations along the shores of the Indian Ocean with coal, they (the colliers) mostly manage to find clay and fire clay on their ground, make brick, and realize very good prices for same.

The natural conditions for the brick industry here are extremely favorable. The Transvaal, on the whole, is a large, high plane of rolling country with mountain ranges. Johannesburg is the highest point on this latitude betwen the South Atlantic and the Indian Ocean, and some of the rain water which falls here runs either way. The approximate height above the sea is given as 5,735 feet. The nearest coast is about 250 miles east.

We have always some wind, and on that account the heat of the sun is never oppressive. Nine days out of ten all the year round the wind is strong enough to furnish power for windmills. The rain, on the whole, is very slight and only in our summer season, and mostly accompanied by severe, short thunderstorms. We have no fog at all. In our winter (July and August) the water freezes sometimes over night and white frost covers the ground in the morning, but as soon as the sun comes ice and frost are gone. The greatest part of the year we have a cloudless sky and warm sun. With the high, dry atmosphere and constant wind we require here no artificial dryers but large, open sheds of light wood framework, covered with corrugated iron as a protection against rain and sun. In the burning of brick many use only the open kilns, built up of dried brick. Others have the continuous kiln, and besides that sometimes a small auxiliary kiln for special things. In the eastern States and England a substantial superstructure is often erected above the continuous kilns. Some have such an one here, but so close upon the tropics a light framework with corrugated roof is better suited. An auxiliary smaller kiln for the burning of special classes of work may also be required.

I do not think any of the brickyards here run any plant to full capacity. As a rule, each one has some weak point, preventing it from having any stated full capacity, and they have a good excuse for having one by saying that they do not desire to run the plant to full capacity. Then there is another point to be observed, viz.: you can see at the first glance that in many cases the plant has been put up after the many times approved standard drawings of the manufacturer of the machinery in England, suiting very well the conditions there, but without any reference to the conditions here. It must not be overlooked, the peculiarity of our English cousins, who consider it next to unlawful to depart in anything from "the way it has always been done at home."

Bradley & Craven have an agent here and have built up some yards. The clay is run up an incline (there are throughout two sets of machinery quite alike). Each set contains one pair of smooth rolls, a large edge runner or dry pan. The pan is of very large diameter, so that the perforations in the bottom of the pan are beyond the track of the runners. The spout discharges into a pit, from which an elevator raises the material. From the rolls a screw conveyor carries the clay to the horizontal pug mill and then by a short vertical pug mill to the press. A horizontal disc contains the forms. The smaller machine in front, driven by eccentric, is a finishing press. As the raw material here is in so good a condition, they mostly dispense with rolls and edge runners or dry pan and run the clay directly to the pug mills. Another type of plant has also the incline, then the smooth rolls, C and C; also an edge runner or dry pan with bottom discharge and elevator.

In some cases they do not use the rolls nor the edge runner or dry pan. The continuity of the machinery is badly arranged and would not work well together without a great deal of trouble. In fact, they could not use it as arranged, and so they do without it, simply saying that they don't need it, especially as the material is very fine and homogeneous. The clay goes into a horizontal pug mill and then into stiff clay machines, which dish out the streams of clay in different directions. As they cannot cut the brick with the wires while the bar of clay is moving, the discharge occurs alternately, first to the right and then to the left, so as to give the men a chance to do the cutting by wires on one side whilst the discharge continues on the other side. In all the plants here I have noticed that the arrangement of the machinery and plant and the continuity of the operations was a failure. Of course, they had to set the machinery as they got it, and where the work of the machinery would not come in well they did without it and helped themselves with hand labor.

It seems to the writer that the manufacturers of machinery are short sighted to allow their machinery to be placed in this way. It would pay them to have the machinery erected properly. They ought to send or employ an engineer here who will take such plants in hand, find just what is needed, and draw plans and specifications and attend to all the various details, besides, supervising the erection of the plant, and to stand by until the whole will work to entire satisfaction.

At another yard they have a deep and long clay pit, with suitable car tracks at the bottom. The clay is conveyed in cars to the bottom of the elevator and hoisted vertically to a platform above machine. With a centrifugal pump they keep the pit clear of water. Sometimes the clay is conveyed by a bucket elevator to the cars at the bank, which will carry it per incline to the rolls or the brick machine.

[To be continued.]

Written for The Clay-Worker.

CAPITAL NEWS.

—Washington Brickmakers Busy and Prosperous.—

IN A RECENT information quest among the Washington brickmakers your correspondent found that, while business was not quite as good as it was earlier in the building season, there is a continual output of material, making an aggregate from all the factories whose product is sold by the Standard Brick Co. of between 4,000,000 and 5,000,000 brick per month. The total capacity of these factories for the same period of time is from twelve to fifteen million. But, though running their plants at so much less than their capacity, the brickmakers here have made a great deal more money this year than was made last. This is owing to the fact that the Standard Brick Co. has obtained better prices from their patrons than obtained heretofore, and has made business matters much easier for the brick manufacturers.

Notwithstanding the high prices of material, building operations at the capital have been fairly extensive during the summer and fall and workmen have been kept busy at good wages. During one month alone (September) sixty brick dwellings were erected, and the amount expended for buildings and repairs was something over a third of a million dollars. At present the demand for brick is mainly for larger structures, although quite a number of small houses are being erected. Of the former class is the census office, which is in a fair state of progress, and will be completed by the first of the coming year. In this structure, which covers an area of 92,000 square feet, 15,000,000 brick will be used and about 700,000 feet of lumber. The building of the huge office is said to be the most rapid piece of work ever done in the capital city. The time expended in its construction when completed will have been about six months.

In the west end is the home of Admiral Dewey, No. 1747 Rhode Island avenue. This is not a new building, but was built a number of years ago. It is also not a "grand mansion," being but 27 feet in width and 72 feet long. The height comprises three stories and the rooms are 17 in number. The house is built of brick, with brown stone trimmings; behind it is a yard 40 feet deep, and in front is quite a wide space formed by two avenues and M street coming together at this point.

While conversing with a brick man recently about matters pertaining to clay, I was told, as I had been told a year ago, that this material was getting scarce in the District of Columbia. From personal observation I am inclined to think that my informant is somewhat "off" in his calculations. It is true some clay-bearing property owned in the district by brickmakers may be very low in clay-producing value, but this is far from being the case generally. And there is a great deal of valuable untouched clay deposit in the land around Washington which is becoming more and more valuable as time goes by for building purposes. Take a walk in any direction outside of the city and you will see clay outcropping in almost every hill that has been cut into. And beyond in the hills of Maryland and Virginia (in the latter State are a number of factories that furnish a great deal of brick building material used in Washington) clay is abundant.

There has been a vast amount of clay put into brick for the building of this beautiful city. About one hundred years ago the clayworkers began to take from the soil of the District (from that of the city itself) that which has made the city, and yet mother earth still opens here her breast to the pick of the toiler, while the ruddy children of her body, the brick habitations of man, continue to stretch out and out in graceful lines toward the historic hills on every hand.

The building story of any big city is of deep interest, but the story of the capital city of a country such as ours is doubly interesting. The work, while it would please me much to perform, I cannot here write, but, since we are soon to have the celebration of the removal of the seat of government to Washington, I will take just a step back to ancient days and say something that perhaps will be of interest. Before putting on a spike-tailed coat and knickerbockers, I will say that the capital city now contains about fifty thousand homes, its paved and lighted streets aggregating a length of something like two hundred miles, and the aspect of cleanliness and hygienic conditions is such as to warrant in this respect the title of model city.

And now we are at the U. S. capital at the beginning of the nineteenth century. We stand on the west end of Capital Hill, and near-by the unfinished capital lifts its white sandstone architecture above the surrounding waving verdure. The vision roams over forest and field to the city of Georgetown (now West Washington) to the Potomac, gliding by the hill of Virginia and to the city of Alexandria in the far distance. On every hand are trees, except where land has been cleared for building, and amidst them run streets whose pavements are mud. Far to the west the new White House sits like an isolated palace, and here and there a few scattered houses assist in proclaiming the dawn of municipal progress. And this is also proclaimed in the blue smoke that in a few places is drifting skyward—not from houses, but from brick kilns, in the midst of the city.

It was needless to go into the country for clay when the house was to be built—the city property furnished this. Hand-made brick were produced, the clamp kiln built, and the forest at hand furnished wood for the burning. The brick nearest the fire were blackened and partly glazed. These were often used for ornamental bond work. Those in the middle of the kiln were clean and well burned, while those farthest from the fire were soft and were used for inner walls.

An "ancient" congressman, writing of Washington at this early time in its history, says, in part:

"The city has also the inestimable advantage of delightful water, in many instances from copious springs, and always attainable by digging a moderate depth, to which may be added the singular fact that such is the due admixture of clay and loam in the soil in a great portion of the city that a house may be built of brick made from earth dug from the cellar, hence it was not unusual to see the remains of a brick kiln near the newly erected dwelling house or other edifice."

In another place this old solon criticises the appearance of the city as follows:

"There appeared to be but two really comfortable habitations in all respects within the bounds of the city, one of which belonged to Daniel C. Carroll, and the other to Notely Young, who were the former proprietors of a large portion of the land appropriated to the city, but who reserved for their own accommodations grounds sufficient for gardens and other useful appurtenances."

And so the now great capital city was begun, with the clayworker in its midst, by whom the foundations of structural progress are laid and maintained. Nicodemus.

OBITUARY.

Almon H. Clark.

THERE DIED in the town Hermon, six miles west of the city of Bangor, Me., on Saturday, Oct. 28, one of the pioneer brick manufacturers of eastern Maine. His name was Almon H. Clark, and his age at the time of his demise was seventy-one years, two months and five days. Thirty years ago Mr. Clark was known throughout New England and the middle West as one of the most enterprising of the craft. He operated a large plant in Brewer, in which he gave much attention to producing many styles of building and ornamental brick, as well as various forms of tile for paving and drainage purposes. His various forms of clay product were made by the simple old Hobbs soft mud machine, with the well-known foot treadle and hand carriage lever. Among these varieties was an eight-inch square brick for sidewalk. He also made a drain tile by constructing molds that turned out brick sixteen inches in length and of present standard thickness and width on the sides, both with hollow center. One mold made the under half of the tile, the other made the upper, each being made to interlock and form a complete round passage in the center when laid together. There was a great demand for both products for a time, but it died away. Mr. Clark was the first brickmaker in Maine to introduce off-bearing trucks, which he did first as an experiment. It was an experiment much derided by the other brickmen at the time, but it won its way before the season closed, and it increased the striking capacity of a three-men crew from 6,000 brick in half a day to 8,000 and even as high as 13,00 in six hours. Notwithstanding his energy and progressive spirit Mr. Clark died very poor. The panic of 1873 drove him out of business, along with many other brick manufacturers of Maine and elsewhere.

He leaves four sons, William Clark, a brick manufacturer in the vicinity of Puget Sound; Manly, a brickmaker somewhere in the West, and Stillman and Joel Clark, farmers and brickmakers in the vicinity of Bangor. Mrs. Clark survives him. The passing of Almon Clark is forcibly and sadly suggestive of the fleeting character of everything worldly. A quarter of a century ago he went out of the manufacturing life to the section in which he lived, like as if a great oak had been removed from a barren field. He lived to be forgotten in the town where he once led his fellows, and few among them who read his death notice in the papers to-day will recognize in it the name of a man they once knew.

Written for THE CLAY-WORKER.

THE NEW YORK BRICK MARKET.

—Burning Brick With Coal—

SEEMS TO INCREASE slowly but surely. As I have before written, one kiln has been burned, and with success. On the same yard another has been burned and opened and found "A No. 1." The top bench had some popped brick, but not more than is seen in wood-burned kilns. The successful burning of these two kilns by the foreman, who had no previous experience, speaks well for his judgment, and certainly should tend to cause others to have confidence in themselves and be ready to take hold and try. He will burn the present week the last wood kiln that will probably ever be burned on that yard. There are only two green kilns open to finish the season; they are to be burned with coal. It being late in the season, the green brick are not as dry as they should be, and will be a further test of coal for fuel under different conditions.

On another yard there are two kilns to be burned with coal. This foreman has had the benefit of having been around several kilns that were burned by Mr. Sutton, of Kingston, N. Y. It is likely that his kilns will be an improvement over the work of a novice, as he has a knowledge of the material which the other did not possess. The Gardner Bros. have a four-arch kiln ready to burn with coal. Whether they will take charge of it in person, for they burn their own brick, I do not know. Report says yes, and again says that other parties are to oversee it. The probabilities are that it will be burned and shipped before the close of navigation. If the five kilns under the three sheds turn out good, it will boom the use of coal the coming season. What will the poor wood dealers do then?

THE CLOSE OF 1899 SEASON.

Molding for the season is drawing to a close. It certainly is nearly time to stop—nearly the first of November. October has been an exceptional month. No rain to speak of, some frost, in the main warm, some fog, but no wind to dry the brick, and at present Indian summer weather as a rule.

THE MARKET.

I am sorry that it is not doing better as to price. As regards demand, it is all that one would want. On October 19th there were three barges in market. The week ending on the 26th, 66 came in, making 69 for the week, and in the seven days 66 were sold. Surely that should place the market in the sellers' hands, as the arrivals were from 30 to more barges less coming on the market each week. As high as 100 a week have been sent during the summer. As the shipping is curtailed probably by the scarcity of men and the finishing up of the molding season, the manufacturers will be at liberty to rush them on the market if they think the figures call for free shipments.

Haverstraw, $4.87½ and $5.12⅛.
Newburg Bay, $4.75 and $5.12½.
Up Rivers, $4.75 and $5.00.
Hackensack, $4.62½ and $4.87½.

If that is not enough to try the gray matter to explain why such low prices, I may say falling rates, exist at the end of a season which has been a record-breaker in the building trade. How long before a "Moses" will appear to lead the trade? It needs one.

A. N. OLDTIMER.

Hackensack N. J., Oct. 31.

CONVENTION DATES.

Illinois Clayworkers' Association, at Ottawa, Ill., January 9-10, 1900.

Iowa Brick and Tile Association, at Mason City, Ia., January 17-18, 1900.

American Ceramic Society, at Detroit, Mich., February 5-6, 1900.

National Brick Manufacturers' Association, at Detroit, Mich., February 7-10, 1900.

Ohio Brick, Tile and Drainage Association, at Columbus, O., February 13-14, 1900.

Nebraska Brickmakers' Association, at Omaha, Neb. Date not announced.

A FINE RECORD.

Burning Face Brick with Practically no Waste Brick.

The Green-Hunter Brick Co., whose works are located at Thurber, Texas, are having remarkable success in all the departments of their work. They are now making both building and paving brick of excellent quality. Their face brick are particularly fine; they are made by the dry press process on a Ross-Keller machine, and burned in down-draft kilns of the Grath type.

In reply to a letter asking how they were getting along in this department, they wrote as follows:

Thurber, Texas, Jan. 30, 1899.

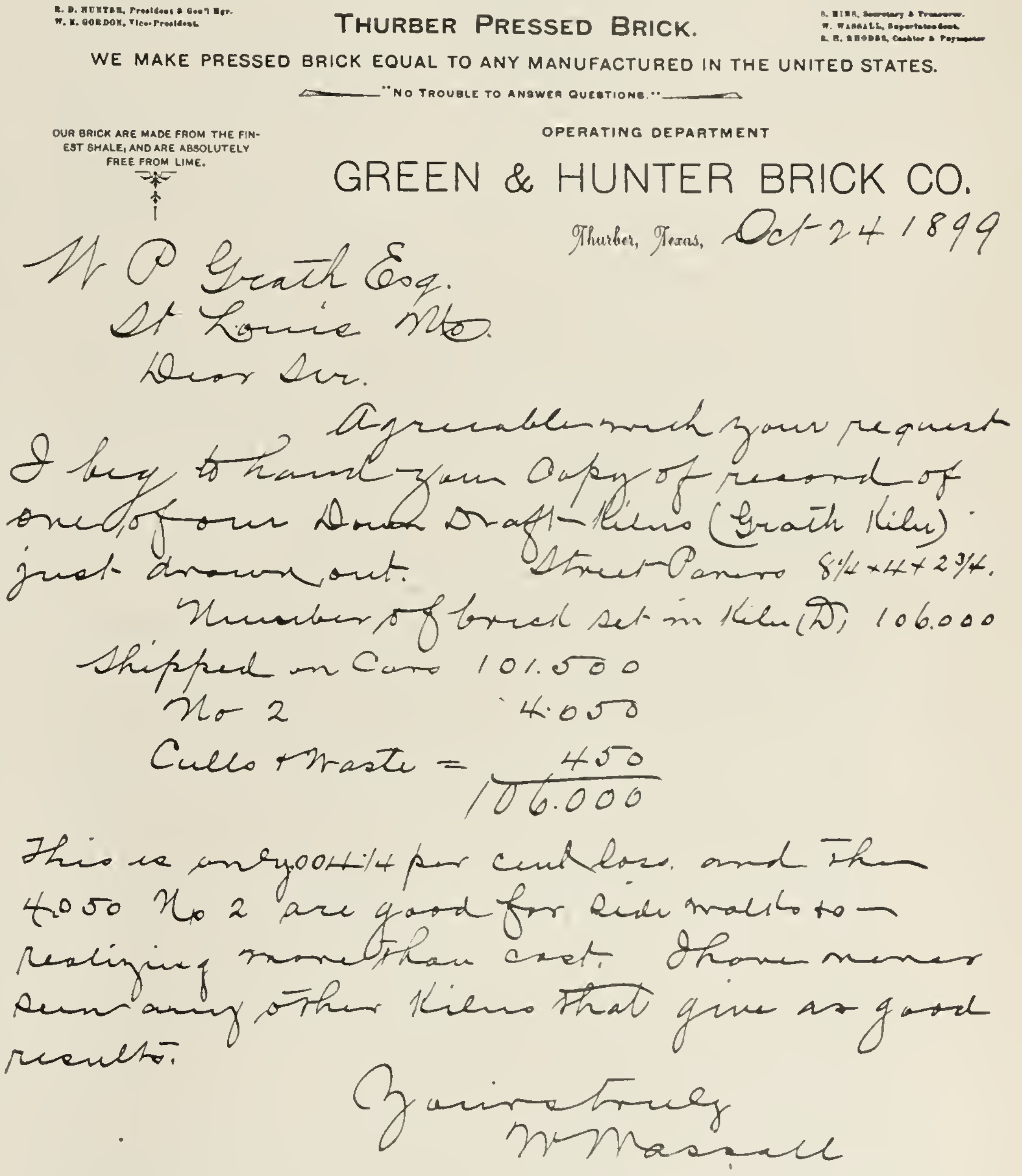
W. P. Grath, Esq., St. Louis, Mo.:

Dear Sir—In reply to your inquiry of the 27th regarding your kilns, I will say: On starting up the works here four of your down-draft kilns were built, which proved so satisfactory that four more have since been built, giving excellent results. We use them for burning fine face brick and vitrified street paving brick.

In fine face brick we get 90 per cent. No. 1 and 10 per cent. No. 2. The paving brick are thoroughly vitrified to bottom of the kiln, giving 95 per cent. first-class pavers. The kiln is easily handled and under perfect control of the burner. I consider it the kiln of the day par excellence. Yours truly,

WM. WASSALL, Superintendent.

This is strong testimony for the Grath down-draft system of burning, and now after the summer's work they write again under date of Oct. 25 the following:



R. D. HUNTER, President & Gen'l Mgr.
W. K. GORDON, Vice-President.

THURBER PRESSED BRICK.

S. MIMS, Secretary & Treasurer.
W. WASSALL, Superintendent.
R. H. RHODES, Cashier & Paymaster

WE MAKE PRESSED BRICK EQUAL TO ANY MANUFACTURED IN THE UNITED STATES.

"NO TROUBLE TO ANSWER QUESTIONS."

OUR BRICK ARE MADE FROM THE FINEST SHALE; AND ARE ABSOLUTELY FREE FROM LIME.

OPERATING DEPARTMENT

GREEN & HUNTER BRICK CO.

Thurber, Texas, Oct 24 1899

W P Grath Esq.
St Louis Mo.
Dear Sir.

Agreeable with your request I beg to hand you copy of record of one of our Down Draft Kilns (Grath Kiln) just drawn out. Street Pavers 8¼ × 4 × 2¾.

Number of brick set in Kiln (D) 106.000
Shipped on Cars 101.500
No 2 4.050
Culls & Waste = 450
106.000

This is only .004 1/4 per cent loss. and the 4050 No 2 are good for side walks to — realizing more than cost. I have never seen any other Kilns that give as good results.

Yours truly
W Wassall

The Illinois Supply and Construction Co. report that they are having a large number of inquiries and are making some good contracts in various parts of the United States for the Grath down-draft kilns and the Grath slack coal, gas and coking furnaces. Mr. W. P. Grath has also perfected an up-draft kiln with his gas and coking furnace attached. The features of this kiln are that part of the heat produced in the coking furnace is led to the center of the kiln, thereby causing the brick in the center of the kiln to settle the same time as the brick in the heads. This is the only up-draft kiln with the coking furnace attached. A cut of this kiln can be seen by turning to their ad. on page 409. Further particulars will be cheerfully given by addressing the Illinois Supply and Construction Co., St. Louis, Mo.

THE WAR IN AFRICA AND ITS EFFECT ON THE GOLD SUPPLY.

OF THE TEN BILLION dollars' worth of gold produced in the world since the discovery of America, more than one-half has been produced since 1860, and more than one-fourth since 1885. Or, to put it in other words, one-half of th gold product of the last 400 years has been produced within 40 years, and one-fourth within 15 years.

Regarding the effect of the suspension of gold production in the Transvaal, a statement of the amount of gold produced from the mines of that country and the amount produced in other parts of the world gives an opportunity to determine the probable effect. The table shows that the gold production of the entire world outside the Transvaal mines is now double that of the entire world including the Transvaal mines a decade ago, and exceeds that of the entire world in any year prior to 1897, thus showing the ability of the mines of other parts of the world to furnish more than the average additions to the world's money supply than have been made in the immediate past. The table is as follows:

—World's Gold Production.—

	Transvaal.	Other Parts of World.	Total World.
1885	$29,149	$108,406,451	$108,435,600
1886	168,343	105,995,557	106,163,900
1887	821,590	104,953,310	105,774,900
1888	4,691,988	105,504,912	110,196,900
1889	7,229,264	116,259,936	124,489,200
1890	9,067,802	109,780,898	118,848,700
1891	14,182,903	116,467,097	130,650,000
1892	22,024,194	124,627,304	146,651,500
1893	26,580,415	130,914,365	157,494,800
1894	37,185,687	143,989,913	181,175,600
1895	41,562,341	157,201,259	198,763,600
1896	41,728,531	160,953,769	202,682,300
1897	55,659,861	181,844,930	237,504,800
1898	79,213,953	208,214,647	267,428,600

Make and Lay Their Own Brick.

Publisher CLAY-WORKER:

Your favor of the 28th ultimo is received. It was, I assure you, through an oversight that we allowed our subscription to THE CLAY-WORKER to expire. The fact is, business has been quite pressing of late, and thus prevented us from paying attention to minor matters which should be attended to. We always find THE CLAY-WORKER very interesting, that is, while we had time to read it, which, I am sorry to say, is not the case at present, owing to press of business. Inclosed find $4.00 to pay our subscription for this year and also for next.

We have built a fifty-ton per day sulphite pulp mill, in the construction of which over two and a half million brick were used, which we manufactured ourselves, and we are now engaged in building a one-hundred-ton per day sulphite mill, in the construction of which over three million brick will be used, all of which we have already made and burned. During the past year we have made about fifty thousand brick per day, all of which we will have laid by the first of January next in our own work.

Wishing you every success in the circulation of your paper, we remain, Yours truly,

Saint John, N. B., Oct. 5, 1899. B. MOONEY & SONS.

Tribulations of a Brickmaker who Has to Sell His Brick Through a Commission Man.

Publishers CLAY-WORKER:

Inclosed find check for $2 in full for my subscription to THE CLAY-WORKER. There is nothing particularly new here in the brick trade, except good demand and poor prices, which should not be the case, but is the fact owing to the poor way that the business is managed at our New York end. The brick are all sold by commission men, and the brickmaker has no control of his brick from the time they leave his yard until he gets his returns, and then takes just what the commission man sees fit to give him.

Mr. Commission Man gets the same for selling brick at $5 per thousand as he does for $10, as they are sold by the thousand. He gets from 12½ cents to 15 cents per thousand for selling them, and he guarantees the sales, and if he sells a lot to some dealer and that dealer owes him a lot of money, and he comes to Mr. Commission Man and says: "I owe you a lot of money, and I have now a large contract for brick, to be delivered at a certain price (naming a very low figure), and, Mr. Commission Man, if you don't get these brick for me at this low price I cannot pay you what I owe." So Mr. Commission Man starts right in to save himself, and does everything in his power to get my brick and everybody else's to the man who owes him, and at the same time I am paying Mr. Commission Man 15 cents per thousand to get the best possible price for my brick.

Now, don't you think this the greatest bunco game you ever heard of? And yet such is the case, and we brickmakers talk about it, and go on from year to year in just this way, and if any one of us starts in to sell our own brick we have got to do about the same as the commission men do or be boycotted by those who buy our brick. They make docks of our barges, and if we sell for $5.50, by the time the barge gets to the party's dock the price goes off a quarter. They find some fault with our brick and buy another's barge load of brick at the falling price, and delay our boat, so that we either have to take the boat away or take off a quarter or a half dollar per thousand, as the case may be.

Now, I have just had one of these experiences, and it makes me full of vinegar and gall on this question, and if you can suggest some way to rid our business of the commission men as a body, not as an individual, as some of them are good fellows, but, collectively, ruinous to our business, you could save some of us from going out of the business that we like, but cannot stand.

The American Brick Company is trying to consolidate the brick business here, and, I understand, has bought brick property up the North river, and if we could get the business under one head we could control it and do business as men, and not lobsters. Yours truly, JAMES W. GILLIES.

HACKENSACK, N. J., Nov. 4.

HAVE HAD A BUSY YEAR AND ARE PREPARING FOR A STILL BUSIER ONE.

In renewing their subscription to THE CLAY-WORKER the Sheldon Brick Co, Champaign, Ill., write that the brick business in that section has been very good the past season, and there is prospect for still better times next year. As a consequence they are rebuilding their plant and enlarging their capacity. A new brick building for machine and boiler room, about sixty feet square, has been erected, and they are installing a new Monarch machine, which, with their old equipment, a Potts' outfit, will give them a daily capacity of 80,000 brick. The new machinery was placed by James W. Hensley, of Indianapolis, and includes a new boiler and engine. The plant is at Urbana, and is run under the direction of J. W. Stipes, well known among the brickmakers of his State.

A BOOK ON BRICK STREETS.

The Purington Paving Brick Co., of Galesburg, Ill., have published a very pretty pamphlet, entitled, "What Practical Men Say of Purington, Galesburg, Paving Brick." It is bound in paper covers of dark green, with title embossed in gold. The text is brief, and is addressed to "Those who believe that well-paved streets are an evidence of civilization."

It contains a number of illustrations of good brick streets, and a view of the company's factories, which, better than columns of descriptive matter, tell of the immense industry that has been built up in less than a decade. On the back of the cover is the statement that "The Purington Paving Brick Co. has furnished brick for paving in 51 cities in Illinois, Iowa, Wisconsin, Minnesota, Misouri, Michigan, Masachusetts, Tennessee, Indiana and Nebraska, in quantities sufficient to pave more than 181 miles of streets." Between the covers, in addition to the illustrations mentioned, are copies of letters from a large number of city engineers and municipal officials telling of the merits of Purington pavers in no uncertain tone. A copy can be had by addressing the company.

PERSONAL MENTION.

A tiny little maiden came to the home of Mr. and Mrs. Frank W. Butterworth, of Indianapolis, Oct. 10, to whom has been given the name of Catherine Ralston Butterworth. We hope some of these days to see Miss Cartherine at one of our N. B. M. A. conventions.

Mrs. James W. Hensley, wife of James W. Hensley, of Indianapolis, died suddenly while seated at the supper table with her husband Sunday, Nov. 12. Mrs. Hensley had been an invalid for several years, but there was some hope of her getting well, and recently she talked encouragingly of her condition. She was about forty years old.

CORRESPOND-ENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

FROM FAR-AWAY MANITOBA.

A Brickyard in a Primeval Forest.

Editor CLAY-WORKER:

Those of your readers who will take the trouble to look at the map will find jotting out from the northwest borders of Minnesota and North Dakota what appears to be a section of those States that has slid off into the Dominion of Canada and been labeled Manitoba. Here, in this northland, I have been engaged the past few months, putting in a clay steamer and screen. The summer seasons are very short, but they are long enough to enable the enterprising brickmaker to make enough building brick to supply the local demand, which is not very great at present, but will probably increase, as the people are thrifty and progressive. The brickyard on which I have been working is in a primeval forest. The machinery was brought here from Whitemouth, which is at the head of navigation on the Whitemouth river, by Indians in birch bark canoes. The Ross-Keller press and other machinery that is used here was brought here last winter on sleds, through the dense bush There is not even a wagon track to the place. All supplies for the yard are brought in canoes in the summer and on sleds in the winter. A two-wheel scraper for gathering clay and the necessary carts, etc., as well as my steamer and screen, were brought here in canoes by the Indians.

The Canadian Pacific Railroad is making arrangements to build a branch here from Whitemouth next spring, when the town is expected to boom, and you will hear further from a modern dry press brick plant established in the wilds of Manitoba.

My work is nearly done, and I hope soon to enjoy the novelty of a moose hunt, fish for sturgeon with the Indians in Lake Du Bonnet, and then turn my face southward toward good old Virginia. I am writing this letter on a strip of birch bark, which is a very important commodity in this section. You will see it has a smooth, velvety surface, takes ink readily, and, as it folds without breaking or cracking, makes a very good, as well as unique, substitute for paper. This is, indeed, a wonderful country, and I hope to tell your readers more about it after I return home.

Continue to send THE CLAY-WORKER to Mr. Gray, the proprietor of the yard. He will find it a very pleasant companion during the long winter evenings. T. W. CARMICHAEL.

The Burner Gets the Blame, but Little Credit.

Editor CLAY-WORKER:

There was one article in last month's CLAY-WORKER that seemed to attract my attention in a somewhat unusual manner. It was "Brick Dust—Kilns and Kiln Construction." Had it not been for what I considered sarcasm I might not have paid much attention to it, but I am interested when any one speaks of a brick burner. I presume the burner is the one "Ithamar" has reference to where he speaks of the man who shovels coal into an up-draft kiln. I should imagine that is all the poor fellow gets credit for on the yard where our friend "Ithamar" is connected, and then I can imagine the kind of a front he will put on when he is showing some one a well-burned kiln of brick. He says: "I have got a good burn in this kiln;" but if it don't happen to be a good job—well, the poor fellow who chucked in the coal "did not do as I told him to." After the battle off Santiago Schley didn't say, "I did it." Oh, no; he gave somebody else the credit.

Now, as to his width of kiln limit, allow me to say we have some up-draft kilns on the yard where I am working which are twenty-six feet wide, and a more uniform burn than the one they are now emptying I never saw, and there was no wood slid to center; all the firing was done in a firebox entirely on the outside of the kiln wall, and I understand the same kind of kiln is being built thirty feet wide, and does equally as good work; so, you see, I agree with "Press," and, as far as I am concerned, I would go him one or two better.

Now, I will close my little piece by agreeing with "Ithamar" in regard to the tinker. ANGLAIS.

Chicago Happenings in Clay—Symptoms of Labor Troubles—The Builders' Club a Success—How Gates Bought a Dog.

Editor CLAY-WORKER:

I herewith give the following preamble and resolution, adopted the 7th inst., at a meeting of architects and contractors, held at Orpheus Hall, Schiller Building:

"Whereas, during the past year the cost of erecting buildings in Chicago has increased so much as to seriously retard the consideration of new work on the part of owners and investors; and

"Whereas, this advance in cost is due mainly to (1) the higher price of building material; (2) the increase in wages paid to the workmen; (3) the limitations set by the unions to the amount a man shall do for a day's work, and the arbitrary exactions of the 'business agents;' and

"Whereas, in other cities, where there are no restrictions as to what shall constitute a day's work, the building trade and its allied interests are in a flourishing condition; and

"Whereas, the Building Contractors' Council is endeavoring to have these limitations removed and bring about a more natural and healthy condition in the building trades; therefore, be it

"Resolved, That this meeting extend to the Building Contractors' Council the assurance of its moral support of their efforts to this end."

It would be the extreme of optimism did your correspondent, in the face of this "cry from Macedonia," assert that the next few months offered any relief in the building line. As to the price of material contributing its quota to the generally unsatisfactory condition, it is nothing as compared to the iron hand of the trade union. As to material, an architect who draws the plans, and in many cases this same architect "financiers" the entire operation, and the contractor who figures to secure the contract, know absolutely what the stone, brick (pressed and common), lumber and trim will cost, and if they secure their figures from reliable material men no change in the market will affect them. On the other hand, the suicidal policy, with which we are all familiar, of scaling the material to fit the owner's "pile," without a corresponding shrinkage of the original plans, and when all is settled satisfactorily to the owner and architect, then come the troubles of the contractor in his deals with the various unions.

The object of the meeting in question was to form the nucleus of an organization, which, through the very necessity of its formation, would include all that are interested in the building line. While the object was well advertised, the attendance did not meet the expectations of the Chicago Architects' Business Association. The Real Estate Board did not consider it of sufficient importance to be represented, and, while the Contractors' Central Council, composed of fifteen different trades in the construction of buildings, was represented, it is a fact that neither the Chicago Masons' Association, Builders' Exchange nor Builders' Club were officially represented. The idea of a "lock-out," to take effect Jan. 1, 1900, providing the Building Trades' Council adheres to its "rule or ruin" policy, is hardly feasible.

It may be a bit of news to the gentlemen who were at this meeting to know that it is very easy for the small investor to build at the present time independent of the various associations. He can secure his plans, not from a member of the Architects' Association; let his contracts for the various lines required, mason work, not to a member of the Chicago Masons' Association; carpenter work, not to a member of the Carpenters' Association, and may employ on the job men who do not belong to the union, or, if so-called "union men," they receive on pay day a "dummy" envelope, bearing on its face figures corresponding to the union scale, but deficient as to contents.

The Building Trades' Council can give points and spades to all of the allied building interests—architects, contractors and material men—and then come out a good second. Their success is due to their one set purpose, to get every dollar they can, no matter who puts up. To meet this condition, architects, contractors and material men must first realize that honesty of purpose and fair dealing among themselves must first be established. When this Eutopian idea is consummated the Celestial City will probably extend them a call en masse, as—but why dissemble? To use the Cleveland aphorism, we are confronted by facts, not theories, and it behooves all interested to get a move on and work for their own good, and, incidentally, for the good of others. To add to the general joy of the Chicago brickmakers, the Bricklayers' Union of Joliet, Ill., has boycotted Chicago brick. How successful they will be depends.

A crumb of comfort is thrown to the hungry ones in the action of the school site committee of the Board of Education, the 25th ultimo, in recommending the erection of fourteen schools, at a cost of $1,000,000. If the board adopts the recommendation, the City Council will be asked to grant an appropriation when the annual budget is made up in February. Notwithstanding the unsettled condition, the month of October proved fairly satisfactory, from a builders' standpoint, though the cost of improvements, as compared to October, 1898, decreased over $600,000.

If the mountain will not come to Mohammed, then Mohammed must go to the mountain. This is pat, compared with our crack builders. At the present time the Geo. A. Fuller Company is erecting an eleven-story apartment hotel building in Boston, Mass.; F. M. Garthwait & Co. are at Battlecreek, Mich., building for the Postum Cereal Company, and the C. W. Gindele Company is the successful bidder for an addition and alterations to the postoffice and custom house at Dubuque, Ia. It is a $75,000 contract, and the original building sports a stone front that will surprise the modern builder, from the fact that it came from Nauvoo, Ill., at one time famous as the home of the Mormons. While the quarry has been practically abandoned for years, an effort will be made to secure enough stock from it for the new work, so that the building will be uniform. Mr. Gindele is now investigating the quarry, with this end in view. It is a well-deserved compliment to this firm that they have secured the Dubuque job, and as the supervising architect has had experience with them in the government buildings erected at East Saginaw, South Omaha, Burlington, Winona and numerous other cities, he knows what to expect.

The many friends of Mr. George Tapper will be pleased to learn of his rapid convalescence, subsequent to his recent severe illness while on an European tour. The 1st inst. he was at Liverpool, and was able to enjoy daily drives. He is expected home about the 15th inst.

As a "hustling" concern the Purington Paving Brick Company probably takes the—brick. Its shipments from Galesburg, Ill., for the month of October were 1,656 cars, containing 10,192,780 paving brick; total weight, 73,560,400 pounds. Illinois, Iowa, Missouri, Wisconsin and Minnesota points divided the honors, and all attest to the superior Galesburg product.

On Oct. 24, at Pittston, Pa., Warren A. Wells, senior member of the contracting firm of W. A. & A. E. Wells, passed from this life. A pioneer in the building interests of Chicago, he had developed from the old style cumbersome structure to the modern steel construction, and has left as monuments to his energy and capability some of the finest buildings of the city. In addition to the material evidences of his being, he has left with his family a loving memory of the father, comrade and counselor, and with his friends and business associates the memory of a genial, positive, whole-souled, honest man.

The regular quarterly meeting of the Builders' Club was held at its rooms, Chamber of Commerce Building, the 4th inst. At 1:30 p. m. President Kirk announced to the thirty-five members and fifteen guests that lunch would be served, after which the regular report would be submitted. The tables were tastefully decorated with ferns, chrysanthemums and carnations. When all were seated President Kirk, in a few well-chosen remarks, welcomed the members and guests, and, as it was purely informal, the hour spent in discussing the dainty lunch served by Caterer Mangler quickly passed, and when the president's gavel descended with a bang, calling the assemblage to order, each individual seemed at peace with himself, the world at large, and the Builders' Club in particular. The report for six months, ending July 1, showed ninety-six resident members, two nonresident members and four honorary members, a total of 102. The club has no debts, and a good, healthy cash balance in its treasury. The annual election occurs the second Monday in January. The following members were appointed as inspectors: T. D. Whitney, Jul. J. Pleas and Jas. A. Hogan. Among the guests were Colonel Moulton, of Spanish war fame, and W. Bryce Mundie, architect of the School Board. Colonel Moulton expressed his surprise as to the size and scope of the Builders' Club, and he appreciated the pleasure of being with them. Mr. Mundie "brought down the house" when he repeated his conversation with a member as to House rules: "House rules! We have no House rules. Every man says what he wants to say, and the others have to take it." In the hour devoted to sociability it was proven conclusively that for postprandial speakers many of the members could discount the efforts of Mr. Depew could they have the opportunity. In the numerous speeches it was a notable fact that the absence of petty jealousy or irritation of any kind was commented upon as showing the efficacy of the organization and its value as a purely social feature. Long life to it and its members.

Everybody, or nearly everybody, that knows THE CLAY-WORKER knows W. D. Gates, quiet, sedate and almost of judicial cast of countenance. Underneath this quiet exterior there is a "sporty" streak—runs to dogs—and thereby hangs a tale. He bought a dog recently, and it was a most singular proceeding. He declared that he didn't want a dog; wouldn't know what to do with it if he had one; dern a dog, anyway, and, besides, this particular dog was dead; been dead a month or so, and, under the circumstances, while one could not at the present time call him a good dog, his strong points were apparent. But the dog's former owner was persistent; claimed the dog was a full-blooded Angora, or Poland China, or some other rare breed, and called numerous witnesses to attest to the virtues of the departed canine. On the other hand, Friend Gates summoned an array of dog experts to prove that the dog was an ordinary alley dog, and had, in fact, shot himself with a ham bone. Twelve good men, and true, finally decided that the dog was worth $40 and costs, and the beautiful suburb of Hinsdale (the home of Mr. Gates) is now torn up with the question, dog or anti-dog, and Mr. Gates is minus the dog. More anon.

CHICAGO, Nov. 10, 1899. VERITAS.

An Irresistible Combination.

Editor CLAY-WORKER:

My CLAY-WORKER has not been coming lately, and, as I could no get along without it, I looked it up. I finally found the July, August and September numbers quietly reposing in the postoffice at Sulphur Springs, Ga., no notice having been sent to me. The postmaster said he thought I did not care for it, but I told him he might as well think I would not care for a good gold mine.

Please change my address to Metcalf, Ala. I was very much pleased with the article on "The American Potter," in the July number.

There is no doubt in my mind that the potter of to-day should combine a knowledge of chemistry with practical experience. This applies to all clayworkers. Neither the chemist nor the practical man alone can accomplish the best results. Nor can the practical man, without a knowledge of chemistry, properly apply the chemist's data, and even with a knowledge of chemistry cannot so thoroughly and completely apply as though the data were secured by himself.

When the chemist and the practical clayworker are combined in one man, so that the one brain observes the chemical and scientific facts and also makes the practical application of them, we will begin to reach that degree of perfection in clayworking for which we are all striving.

Under separate cover I send you two samples of washed clay. The yellow one is our regular washed clay, and the white one is from the same piece of clay, with the iron removed by a process to which I subjected it. This process materially enhances the value of our clay at a very slight extra expense.

HENRY R. GRIFFIN.

Yankee Progress Slow but Sure.

To the Editor of THE CLAY-WORKER:

If I may occupy some of your valuable space, I would like you to publish a good scolding to the brick manufacturers of New England, who attempt to imitate the clam and rest satisfied with the world as they find it within the shell of ignorance which they have built and maintained around themselves.

New England in the past led the country in the methods of making brick, and in the quality and quantity of the brick produced. Yankee ingenuity, Yankee intelligence, Yankee inquisitiveness and Yankee industry and energy were the golden texts beaten into our brains at school until we grew up to believe that God Almighty showered all the blessings of intellect upon us and left the West and South nothing but Indian war and race riots. How we pittied the benighted Westerner and Southerner in our youthful hearts. In the meantime we have been growing older and observing more, and we find New England has fallen behind in the industries where once she led. We find her Yankee clayworkers a class of hard-shell crabs, plodding along as their grandfathers plodded, half disgusted with their lot, yet with not gumption enough to try and discover a way to better themselves.

The surest way and the easiest way for the clayworkers of New England to improve their condition and elevate and make successful their business enterprises is in meeting and comparing views with others of their craft. Others long ago in every trade have found this way, and have benefited by it. The New England brickmaker alone is so dull and sodden that he cannot lift his eyes to see it.

There is a chance for New England clay fields and New

England clayworkers if the latter will only avail themselves of the chances which lie in their way. The brick manufacturer who is not a member of the National Brick Manufacturers' Association has missed his generation or his vocation. He ought to retire before the world retires him and go fishing.

But the "we can't afford it" element is in them, and the "we can't afford its" will find the most of their troubles arise, the loss of their markets comes from ignorance of modern methods of manufacture and modern means of conducting business. They will find before long that the "can afford it" element is bound to supplant the shell barks, penny saving, pound losing relics of the dark ages. For New England's sake I would like to see her more fully represented in the Brick Manufacturers' Convention next February in Detroit.

ALFRED WEBB.

Nov. 4, 1899.

Good Chance to Acquire a Dry Press Plant.

Editor CLAY-WORKER:

Doubtless there are many readers of THE CLAY-WORKER who contemplate going into the brick business the coming year. For those who favor the dry press process there is a rare opportunity in an established yard situated some twenty miles from Cincinnati. The plant is now obliged to shut down for want of working capital, which compelled it to refuse a number of good orders this last season.

An experienced dry-press-brick maker, with a few thousand dollars to put into the plant, could build up a good business. It is the only dry press plant in that section of the country. The brick can be put into Cincinnati at a freight rate of 60 cents. The nearest front brick plants are those at Zanesville and Findlay, which are handicapped by a freight rate of over $3 for the same market. I think this is an excellent opportunity for any of your readers who desire to go into the business for themselves. Those wanting to investigate the situation can obtain full particulars by addressing Mr. C. H. Blanchard, at Batavia, O.

MILTON.

PACIFIC COAST NEWS.

THE CLAYWORKING fraternity is running along on small work, which seems to be the order of the day. General trade conditions on the coast and locally are improving steadily, and there is a strong feeling of relief on all sides. There is nothing specially important to report in the way of local work other than the fact that the Steiger terra cotta and pottery works are putting in the buff terra cotta work on the new telephone building at the corner of Page and Scott streets, in this city. This job will run on to about $1,000. Sewer work with this concern is very active, and the works are running quite well on this character of stuff.

Gladding, McBean & Co. are doing a great deal of minor work, as are also the other brick and terra cotta establishments.

T. H. Scholer, of Pacific Grove, Cal., who has spent the summer in Iowa, where he is extensively interested in the manufacture of brick, has made thorough tests of the brick clays found in Monterey, this State. One specimen of clay, he claims, will make as good building brick as can be made in the United States. If any demand arises in Monterey county for building brick Mr. Scholer will start a large brickyard.

Fires were started last week in House & Mullinix's brick kiln, at Elko, Nev. They have 150,000 brick in the kiln, and quite a number are already spoken for.

News comes from Manila, P. I., to the effect that the quartermaster's department has advertised for 3,500,000 bricks, to be used in the construction of the ice plant and in other government work to be carried on there. It appears, however, that bricks of the kind wanted and in the quantities desired are not easily obtained. There are a few old-fashioned brickyards along the Pasig that in the aggregate would probably turn out 500,000 bricks per month. This amount of building material would not be a drop in the bucket when compared with the quantities required, and to buy bricks in the United States or Europe would, on account of the distance, be very expensive, and also would occasion a long delay. Excellent clay is found in various parts of the island, and it is thought that an abundance of sand of the sort required in brickmaking can also be procured there. If this is the case, it is feasible for the government to save a great deal of time and money by building and operating its own brick factories, and it is more than possible that something will be done at once in this direction. The question is now being considered by the authorities, and the plans now made call for the immediate construction of brickyards that will be supplied with the latest improved brick molding machinery and capable of turning out millions of bricks, where the brickyards now in existence would not produce thousands.

Dr. Hiram P. Tuttle, of Tacoma, Wash., has been in New York and Washington recently, where he has been calling the attention of capitalists to the existence of large deposits of clay which have been found twenty miles from Gold Hill, and are said to be of good fire brick quality. A recent test of the material has been made which showed the following composition, 62 per cent. magnesia, 15 per cent. aluminum, 12 per cent. silica, and the balance iron and waste. Heretofore it has been necessary to import Scotch brick to that section for smelters and coke oven purposes. In case the Gold Hill deposits should bear out all that is claimed for them they will add another valuable resource to the many of Washington.

The Diamond Vitrified Brick Co., of Vancouver, Wash., is putting considerable new machinery in the plant, and within a month will start the plant in full operation. The brick manufactured stands the test better than the celebrated Eastern shale vitrified brick, and a ready sale is assured to the company for its entire output.

Four miles from Stockton, Cal., on the San Joaquin river, is located one of the most complete brickyards on the Pacific coast. The plant is operated by the San Joaquin Brick Company, of which F. W. Muller is superintendent; T. W. Newell, president; I. F. Stein, secretary; Sidney Newell, treasurer, and H. J. Corcoran and A. W. Brooks additional directors. The yards have a capacity of 6,000,000 brick annually and the output has a ready sale.

Superintendent H. O. Bursum, of the territorial penitentiary, has all the machinery in shape to commence the making of brick from a very fine clay shale found near the limestone quarry, two and a half miles northeast of Santa Fe, N. M. The hauling of the clay will be commenced at once. A crusher is in place at the quarry, which will crush sufficient shale to manufacture 90,000 bricks per day. Heretofore the brick manufactured at the penitentiary were of a poor quality, and there was great difficulty in selling them even at very low prices. But now with skilled supervision, new machinery and an excellent raw material it is believed that a superior brick will be manufactured that will find a ready market anywhere.

The Provo Stoneware and Crucible Co., which was recently organized at Provo, has burned its first kiln of wares. John McCloskie, the company's potter, has been experimenting for several months with a number of clays of the State, and by a mixture of kaolin from Cedar valley, with an Echo canyon clay and a Provo clay, he has obtained a combination that produces a ware almost as hard as flint. The first kiln of two thousand gallons burned without a fault.

Ex-Sheriff Brown, of San Bernardino, Cal., has been in San Pedro recently to make arrangements for the securing of land at White's Point, known to contain an excellent quality of white clay, otherwise known as potter's clay. The land is owned by Mr. Sepulveda, and if the citizens of San Pedro offer any substantial encouragement it is probable that a pottery will be established there.

David Wilson intends to establish a brickyard on ten acres of ground in the southeastern part of Sumpter, Oregon. The Sumpter town site syndicate owns the property, and the capacity of the brickyard will be 20,000 bricks a day.

The citizens of Dawson, Alaska, are at present watching with a great deal of interest the construction of the first brick building, which is being erected on Third street, between Third and Fourth avenues, that city. Aside from the novelty of this being the first brick building in Dawson, the greater interest lies in the fact that the brick used are all turned out in a brickyard about five miles up the river, near Swede creek. Mr. O. W. Hobbs and Mr. T. McMullen, the owner of the brickyard, are interested in the construction of the brick building, the dimensions of which will be 32x82 feet. This yard on the Yukon is turning out some excellent brick, and promises to have its hands full in filling orders. The necessity for fireproof buildings is forcing many to resort to brick in their structure, and while at first the business of brickmaking was a losing proposition, the demand has steadily increased, and it is safe to predict that next year will see brick used for the construction of every new building in Dawson.

SUNSET.

San Francisco, Cal., Nov. 4.

THE CLAY-WORKER

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Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

27 Monument Place.] T. A. RANDALL & CO., Indianapolis.

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CURRENT COMMENT.

It is scarcely necessary for us to call particular attention to our leading article this month, entitled, "Old English Brick Cottages," for our readers will surely peruse it with more than passing interest.

* * *

That such comfortable, attractive homes as we illustrate have stood the severe climate of England for two, three and four hundred years, with little or no expense for repairs, ought to make our own home builders think twice before erecting short-lived frame dwellings.

* * *

The first cost of a plain, substantial brick house is but little more than one built of wood. The latter, to be sure, by repeated painting and repairing, may be kept in a fairly satisfactory condition for twenty, or possibly thirty, years, but long before that time it has really cost more than a substantial brick house.

* * *

Considering these things, is it not strange that so many go on building of wood, regardless of the superiority of brick. A modern brick house, properly constructed, is better in all respects; it is warmer in winter and cooler in summer; safer by far from fire hazard, and more substantial and satisfactory in every way, except possibly the one feature of showy ornamentation, at best a very doubtful virtue. Isn't it possible for brickmakers to do a little missionary work in their own interest by bringing these matters to the attention of prospective builders? Perhaps the N. B. M. A. Committee on Trade Relations will be able to point out a way in which this work can be accomplished. Let us hope so.

* * *

We have devoted more space this month than usual to the paving brick interests, but the articles are both so interesting and instructive, and so many of our readers are directly interested, that apologies are hardly necessary. Every clayworker is interested in good roads, for the expense of delivering his product is lessened where hauls are easy. With good streets the wear and tear on wagons and stock is much less than where the roads are so rough that heavy hauling is difficult. There is scarcely a reader of The Clay-Worker who is not directly interested in the permanent improvement of streets and roads, hence we feel that this feature of our work is of vital importance to all, and cannot be pushed too vigorously.

PREPARE FOR THE FUTURE.

Although the brickmaking season is not fully ended, the falling leaf and the chilly days plainly indicate that the end is nigh, but that does not imply that a period of inactivity is at hand. Another summer is coming with its increasing demands, and he will reap the best harvest who but prepares during the winter for it. The readers of THE CLAY-WORKER will remember how many of the craft were disheartened a year ago at the outlook, and how, as a friend and faithful adviser, we exhorted immediate preparations for a good business year. Those who heeded our advice have profited greatly thereby. Get ready now for next summer's business. Repair and add to your machinery, if indeed it becomes necessary to even slacken your pace in making and delivering your output. Our advertising pages will inform you where to get what you want.

BRICK ROADWAYS.

Following the good example of Monmouth county, Coles county, Illinois will lay a strip of brick pavement extending from Mattoon to the Odd Fellows' Orphans' Home, a distance of about two miles. The work will be begun very soon, and a strip of pavement nine feet wide will be laid as rapidly as weather conditions will permit. It will be two-course work on a gravel foundation. If the pavement proves satisfactory it is the intention of the county commissioners to widen it to eighteen feet the coming spring. The contract for the brick has been let to the Terre Haute Brick and Pipe Co. Mr. Will P. Blair, general manager of that company, is giving the work his personal attention, so it is a foregone conclusion that the brick will be properly laid, and this means a satisfactory roadway and the beginning of a movement for better roads that will result in many brick being used in a similar way in that section.

THANKSGIVING.

Before the issuing of the next number of The Clay-Worker our national Thanksgiving day will have come and gone. It is eminently right to set aside a day for the whole people to unite in thanksgiving for the blessings which come to us as a nation. Individuals should be thankful daily for individual blessings, for these come daily to even the most sorrowing ones, but the aggregate of these individual blessings constitutes an occasion for national thanksgiving, and our national and state authorities habitually set apart the last Thursday of November for this purpose.

As a nation we have great reason for thanksgiving. No pestilence has been added to the usual causes of mortality, and our fields have yielded their increase with even more than ordinary lavishness, so that our barns are filled with plenty, not for ourselves only, but for those who need our products, and our shops have resounded with the hum of industry, so that except for the habitual grumbler the season may be marked as one of unusual prospertiy, though inevitably there may be individual exceptions.

From the view point of this annual festival, we may not only contemplate such evidence of prosperity, but we may and ought also be thankful for the indications of success in the unusual undertaking of our Nation in the interest of a downtrodden and oppressed neighbor. Never before in the history of the world did a nation go to war with another nation wholly in the interest of humanity. A year ago it was uncertain whether those who had been rescued from Spanish oppression would prove worthy of the boon we were offering them. It is no longer a doubtful question. They are accepting the new conditions with wonderful alacrity, and the indications are that in a short time a people oppressed for ages will be prepared for self-government, and will enjoy all its benefits. That the far-away Filipinos, who fell into our hands by the accident of war, are for the time being rebellious, owing to the discontent of an ambitious leader, does not render our thanksgiving for the success of our soldiers there the less merited, for if the net results in fifty years shall prove to be not one-tenth as beneficial to us and to the world as to the people over whom fifty years ago under the same conditions we assumed sovereignty without first gaining their consent, none will more heartily join in the thanksgiving for the blessings of the middle years of the twentieth century than will those now redeemed from Spanish oppression and put in training for independence.

But thanksgiving has come to be only a part of Thanksgiving day. By a time-honored custom it is everywhere recognized as the great feast day of the year, our festivities taking the form of family reunions, and the extension of help to the needy. Children and grandchildren meet around the old family board as on no other day, and he must be more than ordinarily connected with the family who accepts an invitation to be a guest. It is the home gathering of the year. Wishing we might look in upon the thousands of families we visit monthly and witness the joy of each Thanksigivng gathering ,we bid all our readers a happy Thanksgiving day.

HIGH PRICES.

A brick contractor stepped into a brickmaker's office a few days ago and said: "I want to buy a couple of hundred thousand brick." "When do you want them," was asked. "I want you to commence delivery day after to-morrow, if we can agree on price." "I cannot do that," was the answer. "We cannot commence delivery for about two weeks." "What does that mean?" asked the contractor. "It means," said the brickmaker, "that we have been waiting for orders for the last few years, and now you have to wait for brick." "What is your price per thousand?" asked the contractor. "Eight dollars." "That won't do," said the contractor. "Well, we can't furnish you the brick for any less," was the answer.

There is a lesson in this. For many years the contractors made the price on brick; just now the demand is making the price, and it is proper for brickmakers to take advantage of it. The market is on the up tendency—the people want brick—the people will pay any price they have to within a reasonable limit. This is as true at one time as at another. The question of price is, of course, the question of demand, but, after all, it is the people furnishing brick who are always so ready to drop prices whenever there is a demand which makes low prices. When the demand for brick is good, there is always an opportunity to get good prices, but when the market is sick, the brickmakers begin to cut—then it is they begin to talk of "combination," and then it is that the difficulty of making combinations presents itself.

Now is just the time to talk about organizations or combinations, or anything which relates to restraining competition. Of course, it is not necessary now; nevertheless, this is the time to make the combination with a view to holding prices up. Brickmakers can now make money—they can now talk to one another without restraint—organization should be made now. We have little hope that this will be done. We can only state what we think—it should be done. We feel this is the time for brickmakers to get together and good-humoredly discuss the question of maintaining prices. The question of fifty cents or a dollar a thousand on brick cuts little figure with the consumer, but of course the consumer will buy brick as cheap as he can. However, it is a well known fact he will pay whatever he has to, and we earnestly beseech the brickmakers of this country to get together at this time and consider the question of prices before the demand for brick becomes less. Now, while the demand is fairly good, is the time to seriously discuss the subject. The history of hard times is well known. Brickmakers get together and talk about the question, consider the restraints of competition, but it is only a short time thereafter when the demand is poor that some one, by some hook or crook, cuts under the grade price.

Now, it is a fact that only so many brick are to be sold, and they might just as well be sold at a fair price as at a low price. Brickmakers should go about this matter good-humoredly; they should get together now, and as business men arrange an organization, as they could do just now without fear of a break in prices, and could see how it works. With this lesson before us we might know the benefits which accrue from organization, and when the time comes and competition is strong and prices liable to go lower, they can be restrained and kept within a reasonable limit, and profit can be realized by all concerned

CONVENTION TIME.

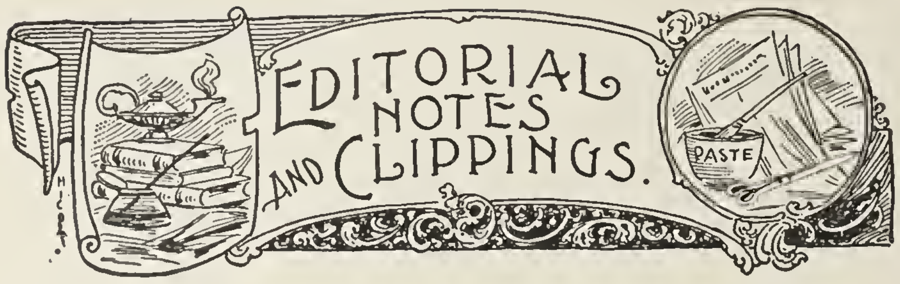
As convention time draws near there are many "straws" that indicate an unusual interest in the National and State Conventions which augurs well for all the trade gatherings this winter. Clayworkers are closing one of the best seasons for a number of years, and there are signs of a still busier year ahead. Perceiving this, many manufacturers are ordering additional machinery and supplies to enable them to enlarge their factories. Others are investigating kilns, driers and improved equipments of all sorts, with a view of making improvements that will enable them to increase the capacity of their plants.

The conventions offer opportunities for obtaining information of a practical character from those who have gone over the ground and made the experiments that the shrewd manufacturer is not slow to appreciate. Now that every wide-awake brick and tile man is up and doing, there will undoubtedly be a larger attendance at all the annual meetings than for several years. We predict that the Detroit meeting, which occurs the week of Feb. 5, will be the largest in the history of the National Association. The secretary of the N. B. M. A. reports that there has been an exceptionally large number of new members enrolled the past year and that the affairs of the Association were never in a more satisfactory condition. The work mapped out for the next convention bids fair to excel, from a practical standpoint, all previous meetings. The secretaries of the various State bodies report a similarly happy condition.

Those who want to add to their store of knowledge and, while doing so, enjoy a social feast with their fellow-workers, should make their plans and arrange to attend these mid-winter meetings. It is time and money well spent. It pays to look beyond your own dooryard once a year. The range of vision at a National Convention takes in the whole United States and part of Canada.

A CASE OF EXPANSION.

As the reader may see by turning to page 341, the Anderson Machine and Foundry Works, Anderson, Ind., are now manufacturing the Berg Brick Press, having purchased the sole right to manufacture and sell this machine from Mr. Berg, the inventor, who is employed by the company to superintend the manufacture and erection of the presses. With their excellent facilities for work of this character, the A. F. and M. Works will henceforth be an important factor in the dry-press business. They request those wanting information in regard to the press to write them direct, or to the Chicago Brick Machinery Co., 225 Dearborn street, Chicago, who are their agents.



EDITORIAL NOTES AND CLIPPINGS.

A. Morey is making preparations to establish a brick plant at Merrimack, Wis.

Harman & Judik, Arlington, Md., write that they are in the market for a quantity of steam pipes.

The Blast Furnace Fire Brick Co. has been incorporated at Sciotoville, O. Capital stock, $10,000.

H. H. Henry, vice president of the McLeod & Henry Fire Brick Co., died suddenly at his home, in Troy, N. Y., the 2d inst.

The Greenfield Brick Co., of Greenfield, Northwest Territory, will establish quite an extensive plant there in the near future.

E. P. Rice, of Toronto, Canada, is at the head of a company to be organized to manufacture brick the coming season at Breslau, Ont.

The fame of Haverstraw brick is constantly spreading, a cargo of 800,000 brick having been shipped to Havana, Cuba, the first of the month.

James Curran is contemplating a change from the use of wood for fuel in burning brick at his plant, at Bakersfield, Cal., to the use of oil.

The Salt Lake Pressed Brick Co., of Salt Lake City, Utah, has purchased ten acres adjoining the old plant, and will enlarge the works materially.

Nicholson Bros.' new brickyard at Steubenville, O., is nearing completion. They expect to be turning out a fine grade of brick now in a short time.

Wilson & Taylor, brick manufacturers, of Triumph, O., are in the market for a seventy horse-power boiler and steam pump, with 2½ or 2-inch suction.

A. F. Eckstine, Chicago Junction, Huron county, Pennsylvania, contemplates going into the brick and tile business, and desires catalogues, price lists, etc.

The Baldridge Bros., Stonington, Ill., have purchased a tract of land in the other part of the town, and will remove their brick plant to the new location at once.

The Central Brick Co. has been incorporated at Pittsburg, Pa., by C. Chappel, D. J. McGarey, L. Plank, of Pittsburg, and C. E. Wrigley, of Ben Avon. Capital stock, $30,000.

The brickyard of Warren Farr, on Reeve avenue, Newburg, a suburb of Cleveland, O., was gutted by fire Nov. 6, causing a loss of $10,000. The fire started in the dryer.

J. F. Williams, superintendent of the Ingleside Mining and Manufacturing Co., Charleston, S. C., desires information in regard to the manufacture of cement, kind of machinery to use, etc.

The Matthews Brick Co. has been incorporated to manufacture brick at Matthews, Ind., with a capital stock of $10,000. John H. Wood, W. Moore, John M. Kilgore and others are directors.

A new enterprise for the manufacture of Portland cement is now ready for the necessary machinery. Those interested will address Dr. G. W. Comb, 30 East Ohio street, Indianapolis, Ind.

Through information received at their office and by their traveling representatives, the Wellington Machine Co., of Wellington, O., know of between fifteen and twenty towns in

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Books for... Brickmakers.

"CLAY GLAZES AND ENAMELS," Henry R. Griffen, C. E.	$ 5.00
"BRICKMAKER'S MANUAL," Morrison and Reep,	3.00
"BRICKMAKING AND BURNING," J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS," Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK," H. A. Wheeler, E. M.,	1.00
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Our great success has not been obtained without merit. ☙☙ Buy Raymond's and you get the best.

☙

C. W. RAYMOND & CO.
DAYTON, OHIO, U. S. A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

different sections of the country which have no brickyards, where such are needed, and where small yards would prosper. They will be glad to give the list to any who think of seeking a new location.

Wm. Burk, the well-known brick manufacturer, of Brewer, Me., has had an unusually busy season, and is now enlarging and improving his yard preparatory for a still busier season next year.

A slight damage was caused by a fire at Booth & Flinn's brick plant, at Pittsburg, Pa. The flames started in the kiln shed, but were extinguished before they had time to spread to any extent.

Walter Satterfield will erect a modern brick manufactory at Cartersville, Ga. Mr. Satterfield is a progressive young man, and it is his intention to make his brick plant one of the best in the State.

The Higgins Brick Co. has been organized at Minneapolis, Minn., for the purpose of manufacturing brick. G. W., E. L., C. L., G. G. and M. E. Higgins are interested. They have a capital stock of $40,000.

The recently incorporated Burns-Russell Brick Company, of Baltimore, Md., will use the Chambers machinery, the whole outfit, including engine and boiler, being nearly erected and ready for use.

H. M. Whitmer, for thirty-nine years a contractor and brick manufacturer of Decatur, Ill., died suddenly at his home, in that city, Nov. 3. A wife and four children, two sons and two daughters, survive him.

S. Geysbeek, ceramic chemist, who has been located at New Brighton, Pa., for the past few years, has recently removed to Denver, Col. Those desiring tests of clay can address Mr. Geysbeek, Box 163, Denver, Col.

The Baltimore (Md.) Brick Co., of which Joseph Wilson is president, will improve and enlarge their various plants in the near future. They expect to expend close to $100,000 on new machinery and appliances.

Thomas Collins, an employe at Carter's brickyard, at East Peoria, Ill., was terribly injured by a powder explosion while blasting out clay in the clay bank. His right eye was blown out and his face horribly mangled.

Chambers Brothers Company, of Philadelphia. Penn., are making an extension to their boiler house and erecting an additional boiler of 200 horse power. They are also equipping their iron, brass and bronze foundry.

The Fernholtz Brick Machine Co., of St. Louis, Mo., write that among recent sales is a complete four-mold outfit to Mr. F. L. Cantu, Monterey, Mex., and another of the same sort to Mr. Carlos Bracho, of Durango, Mex.

The Acme Brick Co. has been organized at Marietta, O., by E. Clark, jr., J. S. H. Torner, H. E. Smith and others. They will at once begin the erection of a plant at Norwood, O., where building and paving brick, tile and roofing tile will be manufactured.

The Edinburg (Pa.) Brick Co. has shut down pending the reorganization of the company. The past season has been a good one for them, the demand for their product exceeding the output. The plant will in all probability be enlarged during the winter.

P. C. Hamilton, of Pittsburg, who recently purchased the Lisbon (O.) tile works, is considering the advisability of putting the plant in operation. The plant is well equipped with the best of machinery, and Mr. Hamilton should realize well on his investment.

In a recent letter F. W. Sears & Co., of Ravenna, Neb., subscribe for the Clay-Worker, and say they are young in the business. They are turning out 15,000 brick per day on a No. 2 Adrian machine, which they burn in a common updraft kiln. They say they want to know the cheapest and best down-draft kiln, as they are thinking of changing to the down-draft system.

Henry B. Berning, a pioneer brick manufacturer, died at his home in St. Louis, Mo., Oct. 28, aged eighty-six years. Mr. Berning began manufacturing brick in St. Louis forty years ago, but retired from the business some years since on account of his advanced age.

The directors of the Mount Holly Brick & Clay Co., of Harrisburg, Pa., have called a special meeting of stockholders for Dec. 11 to vote on a proposed increase of capital stock of the company, which is doing a large business in white brick, the company's specialty.

During the past year the demand for brick at Princeton, Minn., has been greater than the supply. As a result two new brick plants will be established there next season, one by E. M. Farnham, of Pelican Rapids, Minn., and the other by Farnham Bros., of Minneapolis.

John Sailes, Lawrenceville, Va., in a recent letter renewing his subscription, says that he has had a good season, but as he only has a hand-power auger machine he cannot turn out brick fast enough to supply the demand. He contemplates putting in a machine of larger capacity next spring.

The Eastern Paving Brick Co., Catskills, N. Y., have on hand at the present time contracts which call for 6,000,000 brick before the close of the season. These contracts alone will keep them running steady until the close of the year. Their paving brick are going down in many of the Eastern cities.

H. Y. Haws, of Johnstown, Pa., has purchased fourteen acres of ground at Penn Station, Pa., and will at once commence the erection of a silica fire brick plant. It is said the plant will cost in the neighborhood of $100,000. Charles H. Luke and N. Lohr will have charge of the construction of the plant.

George S. Dorney, of the firm of Dorney & Harris, brick and tile manufacturers, of Findlay, O., died from injuries sustained while assisting to lift a heavy stone at the brick plant. Mr. Dorney was forty-three years old, and had been engaged in the brick business about ten years. He leaves a wife and one son.

It is said the largest single order ever placed for terra cotta comes from Havana, and is for conduits for an electric railway in that city. The Morris Electric Co., of New York city, was awarded the contract, which calls for 200,000 feet of conduit. The terra cotta will be manufactured by the Potomac Terra Cotta Co., of Washington, D. C.

J. W. Hensley, of Indianapolis, is still busy, having recently booked a number of orders for brick machines and brickyard supplies. Among the former is a complete Quaker outfit for the Lincoln Coal Co., Licoln, Ill. Judging from the number of inquiries coming in, Mr. Hensley predicts an unusually large demand for soft mud machinery the coming season.

John McKay, traveling salesman for the Standard Dry Kiln Co., of Indianapolis, after a record of 15 years of traveling without being once in sight of a wreck, finally got up against the "real thing," and is now lying in Detroit in a badly bruised condition. While painful, his injuries are not considered serious. He hopes to be up and about in the course of a couple of weeks. Mr. McKay is well known among the brickmakers throughout the country, who will sympathize with him in his hour of tribulation. The wreck occurred on the Michigan Central road, between Toledo and Detroit, the 9th inst., in which a number of passengers were badly injured.

The Twin City Brick Co., of Minneapolis and St. Paul—the works are located between the two cities, and they have an office in each city, the St. Paul office being at 401-402 Man-

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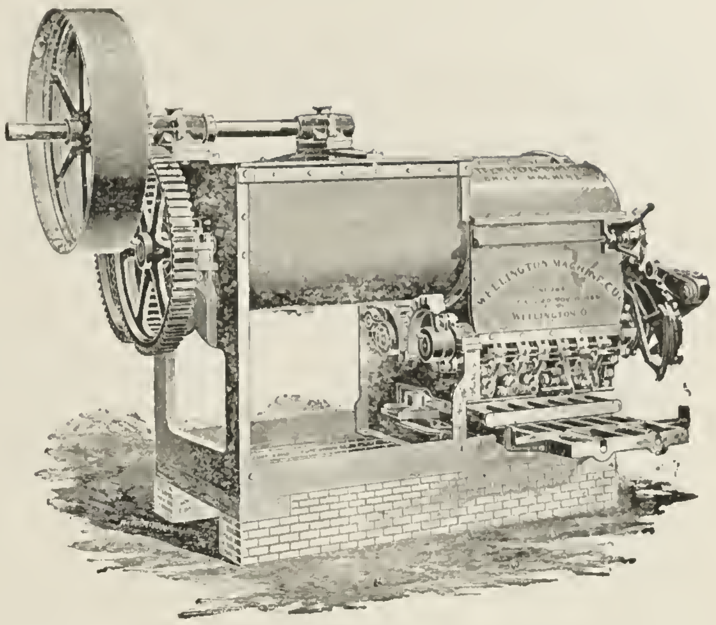
SPECIAL.



FOR SALE:

A Cheap Brick Machine.

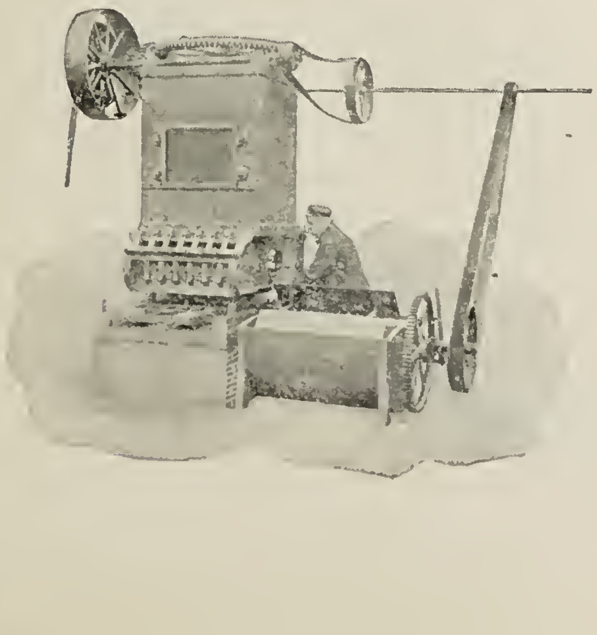
DEAR READER:—

We have been selling machines 20 years, and it has been pounded into us, year after year, that the trade wants the **cheapest** machine, and the trade is right. A brick machine isn't bought for a years use, but for many. Like when selecting a wife it pays to look ahead five, ten. and 20 years and consider how she will wear and what she will cost after the first expenses of getting possession. Many a brickmaker has bought a "pretty good" machine at an "attractive figure," like many a young fellow who marries a "pretty good" girl with an "attractive figure" and in a short time finds them so expensive to keep up, that he rues the day he overlooked getting **brains and reliability** when selecting. Can't buy brains? You bet you can. They are incorporated in a machine, in so constructing it, that it will not only make a perfect brick, but stand up to the work, year after year. "Attractive figures" is a time-worn bait. Wise men don't bite. **Reliability** is really the most important point to consider.

> MORTON, PA., July 4th, 1899.
>
> THE WELLINGTON MACHINE CO.— * * * I have used the **"Monarch" Machine** three years and never had a breakage, nor lost an hour on account of the machine.
>
> Yours truly, H. I. ACKERMAN.

This one is only a sample. In our circular are **many more** stating the same thing. The **dear** machines (which sell at a cheap **first** cost) cannot show such. They give fine "first year" testimonials, but none with the flavor of age. We give a large proportion **after** machine has been used several years. "To get your money's worth," you **must** buy for the **future.**

Remember, that we cannot tell it all here, but that we give you a few pointers to get you started right towards getting the **cheapest** machine in the market. It is cheapest because it does perfect work, and counting three years, five years, ten years or more, it will cost you much less than any other. No other has 14 feet of pug mill. No other has double presses. No other has a press but what wears. We have sold to the most conservative and careful buyers who investigated its record, principles and construction. Just get our circular and see what they say, and also study the "points" in this machine. There are many important ones contained in no other machine. Coal costs money. **Under like conditions** the **"Monarch"** takes one-third to one-half less power. Figure that saving for next ten years.



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BALL-BEARING Barrows and Trucks.

Send for Circular.

The Wellington Machine Co.,

WELLINGTON, OHIO.

EDITORIAL NOTES AND CLIPPINGS—Continued.

hattan building, and the Minneapolis office at 200 Lumber Exchange—report splendid trade the past season. They turn out a high grade of pressed and ornamental brick and architectural terra cotta. Their yearly output numbers 6,000,000 brick. The plant will be considerably enlarged and improved this winter, which will enable them to almost double their present capacity.

J. H. Horner, the well-known brickmaker, of Astoria, Ill., writes that he has had a fairly good season, even though he has had to divide the trade with a new yard there, which has recently been started by Mr. B. Martin. Mr. Horner says he thinks he can burn a great deal cheaper with coal, and so will make arrangements to build permanent kilns next season.

The Zeeland Brick Co., of Zeeland, Mich., has purchased the Leonard brick works, about five miles from Kalamazoo. The yard will be enlarged and improved by the new owners. The Zeeland Brick Co. is the oldest brick manufacturing concern in Michigan, controlling among others large yards at Zeeland, Hamilton and Cloverdale. The combined output of the plants is 20,000,000 brick per season.

A fire at the plant of the Missouri Fire Brick Co., corner Manchester street and Sulphur avenue, St. Louis, Mo., resulted in a loss of $30,000. The drying sheds and machinery buildings were completely consumed, ruining all the machinery. Joseph Walsh, the general manager, says the work of rebuilding will be pushed as rapidly as possible, as they have many large contracts on hand.

S. W. Burnham, president and general manager of the Yankee Hill Brick and Paving Co., Lincoln, Neb., writes that they have recently had their clay tested for press brick, with very satisfactory results. The clay will make a very fine buff or white faced brick. The company will therefore at once put in a plant for making face and front brick, and will also increase their facilities for making common builders.

In a recent letter Simon Favre, president and general manager of the Favre Brick Manufacturing Co., says he noticed the mention of their new plant in the last Clay-Worker, and will be glad to have us enlarge on it, and adds: "The officers of the company are Simon Favre, president and general manager; J. J. Favre, vice president and treasurer; H. F. Mueller, secretary. The directors are J. A. Favre, Adolph Dugue, Wm. Rudolph, J. J. Favre and Simon Favre. The first three named gentlemen are men of considerable wealth, being largely interested both in Mississippi and Louisiana. We are now erecting the plant, which will be a modern one, with a daily capacity of 75,000 brick. The machinery, which we purchased from C. W. Raymond & Co., of Dayton, O., is already here. We have a splendid site, Pearlington, Miss., on the Pearl river, including 410 acres, with excellent clay, and wood for fuel in abundance." It is needless to say The Clay-Worker wishes them unbounded success in the new venture.

The ever increasing business of the American Clay-Working Machinery Co., of Bucyrus, O., has made more office room necessary, as well as more room for the foundry and other departments of the factory. They have recently purchased a two-story brick building on property adjoining their present site, and remodeled it into a commodious office building. They hope to have the new offices ready for occupancy early in December.

J. D. Fate & Co., Plymouth, O., report a very busy season. In a recent letter they say they have just shipped a full outfit of machinery for making brick and tile to the Tennessee River Drain Tile Co., Saltillo, Tenn. Also a complete lot of machinery, consisting of one of their combined machines, side cut automatic brick table, automatic tile table, with winding drums, dump cars, wheelbarrows and all the machinery needed to make paving brick, building brick and tile, to the Suffolk Clay Manufacturing Co., Suffolk, Va. They are also building two large combined machines of 80,000 capacity per ten hours. One machine goes in a complete plant in Kansas and the other to Colorado.

The Ironsides Company, of Columbus, O., report a growth which has doubled their business compared with last year and which has taxed their factory facilities to the utmost, necessitating improvements and extensions now under construction which will permit of a further doubling up of capacity. Among the more important specialties of this company have been materials for internal and external application to wire and fiber ropes, in their manufacture and subsequent use respectively, for the preservation and protection of same, and also lubricants for gearing. Credentials from a large number of users in brick works, cement mills, tile works and other clay working generally indicate the success of these materials, and more especially of the gearing lubricant in the dusty and trying cloudy conditions to which such gears are ordinarily subjected. Among more recently acquired articles of manufacture is given a metallic paint of reported great durability, capable of resisting acids and acid fumes, and to be unaffected by wide range of temperature. A promising foreign trade is developing which indicates furtherance through interest manifested by foreign visitors to their exhibit at the National Export Exposition, Philadelphia. A large shipment to the Hawaiian Islands was among recent foreign shipments.

THE BRICK BUSINESS HIS LINE.

AGENT—"I'd like to make a picture for you like this—Rembrandt and Vandyke ain't in it with this picture. Have you ever been done in oil?"
SILAS WAYBACK—"No, stranger; I don't gamble that way—but I've had a gold brick.

BROAD VERSUS NARROW TIRES.

It has required much demonstration that good roads are a profitable investment. The work of the agricultural experiment stations in this regard has been invaluable. Experiments with broad and narrow tires conducted under the eyes of the farmers have definitely shown the folly of maintaining the present system of small-tired wheels, as long as the roads are indifferent or positively bad in quality. There are two points from which to view the relationship between the tires and the quality of the road. The experiments have shown first that as long as the roads are in poor condition, subject to much moisture and thereby liable to become heavy and muddy at short notice, the use of the narrow tire is a positive hindrance. It requires more power to haul a wagon so equipped, for the tire sinks deep into the material of the road and thus forms for itself a constant obstruction that must be overcome. But the broad tire has a use other and indeed better than that of minimizing the labor and therefore the cost of hauling. It cures the bad conditions that have been largely caused by the narrow tire, serving as a compressor and gradually compacting the material and greatly improving its condition. Thus the use of the broad tire means a double gain. It saves in the cost of hauling by permitting heavier loads to be hauled by the same agencies and in less time, and it saves, too, in the cost of road making and in repairing. It is believed that if all road users could be persuaded to change the tires of their draft vehicles, especially in the district where bad roads are the rule rather than the exception, the ultimate cost of bringing the country thoroughfares up to a modern standard would within a very short time be so low that the most comprehensive road improvement laws could be passed without difficulty. In some States much has been done by granting exemptions from road taxes to those road users who have adopted the broad tires, and likewise to those who have adjusted their vehicles so that the front and rear wheels will not "track," thus minimizing the chances of wearing the surface of the road. It has been found that with broad tires in use the amount of surfacing material needed is comparatively small.—Washington Star.

Davis's Brick, Tiles and Terra Cotta. Third Edition. Revised, Improved and Enlarged.

A Practical Treatise on the Manufacture of

Brick, Tiles and Terra-Cotta:

Including Stiff Clay, Dry Clay, Hand-made, Pressed or Front, and Roadway Paving Brick, Enameled Brick, with Glazes and Colors, Fire Brick and Blocks, Silica Brick, Carbon Brick, Glass Pots, Retorts, Architectural Terra Cotta, Drain Tile, Glazed and Unglazed Roofing Tile, Art Tile, Mosaics, and Imitation of Intarsia or Inlaid Surfaces. Comprising every product of Clay employed in Architecture, Engineering and the Blast Furnace With a Detailed Description of the different clays employed, the most Modern Machinery, Tools and Kilns used, and the processes for Handling, Disintegrating, Tempering and Molding the Clay into Shape, Drying, Setting and Burning. By Charles Thomas Davis. Third Edition. Revised and in great part rewritten. Illustrated by 261 engravings. 662 pages, 8vo. Price...**$5.00**

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Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

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FOR SALE — One "Freese" differential smooth roll clay crusher; good condition.
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WANTED — Some pallets for soft mud brick machine; also 15 or 20 cars, pug mill and crusher. Address
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FOR SALE — 140 rack cars for soft mud process; arranged for pallets; made extra strong and good; but little used; will sell for half price. Address
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WANTED — For a large clayworking establishment, located near New York city, an experienced superintendent or manager, who thoroughly understands the manufacture of fireproofing as well as common brick; applicants please state past experience, amount of salary expected, references, etc. Address
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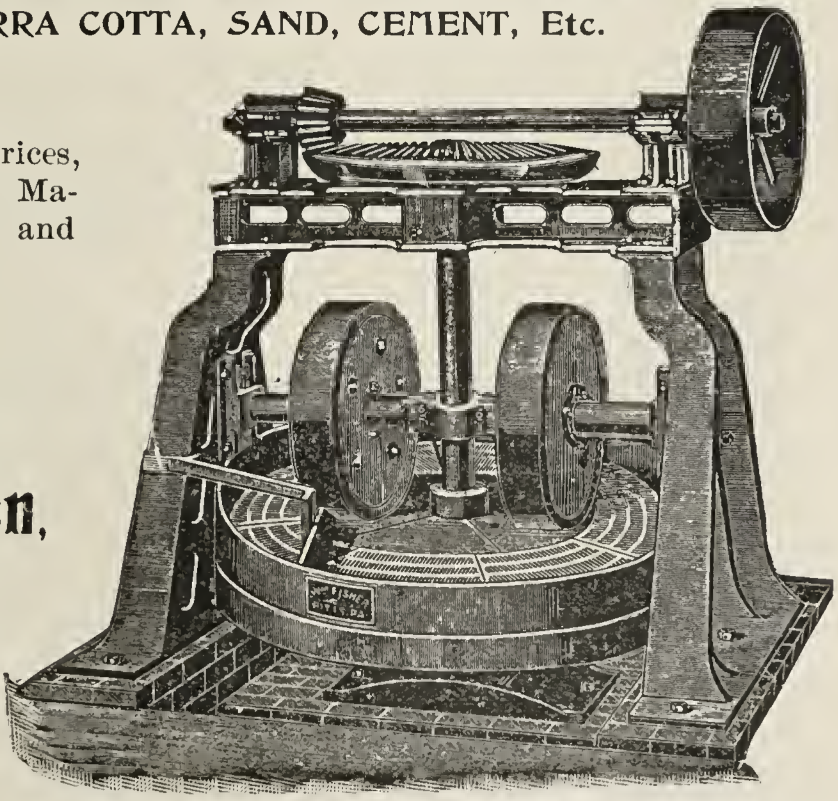

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Brickyard consisting of the following: Fifteen acres of clay land, one Brewer machine, one Little Wonder machine, two patent kilns, with elevator, one dryer and rolling shed, three sheds 25 by 100 feet, five rows of racks with pallets, two patent trucks, wagon, wheelbarrows, picks, etc. blacksmith shop with tools, one locomotive, one forty horse power engine, one dwelling house of eight rooms and shanties for workmen. This yard is located in the South, and in a perfectly healthy locality. No overflow, and can burn with wood or coal. Get all labor needed cheap. Commissary building. Profits of commissary will pay all labor. If party wants to make money here is a chance for a practical brickmaker. Ready market for all brick made. For further particulars write

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One Henry Martin horse-power brick machine; in good order. This machine has been run some five or six short seasons, and will make a good machine for parties that wish to invest but very little to run a small yard.

One Standard wood frame horse-power brick machine; good as new; only made about 50,000 brick.

One Standard wood frame steam power machine, which was changed from horse to steam power, and has only been used to make about 100,000 brick, and is practically as good as new.

One extra heavy wood frame steam power Quaker machine, Haverstraw style, with an eight-foot pug mill, shaft and pulleys all complete; in good running order; has been used some four or five seasons on a summer yard; has been under cover and had first-class care; has a complete set of extras with it.

One Monarch brick machine, in good running order; has been used four or five short seasons on a summer yard.

One Anderson steam power brick machine; 12-foot pug mill and pulleys all complete; in good running order; in fact, this machine is nearly new.

Four Old Reliable hand brick machines; good as new.

One Wellington mold sander; very little used.

One Pott's mold sander; in first-class condition.

One E. M. Freese No. 4 board delivery cutter for side-cut brick on a stiff mud machine. This cutter is practically as good as new. The party of whom we bought it was obliged to change to soft mud, and it has never been used to cut over 50,000 brick.

One Brewer crusher complete; in first-class order; been used two seasons on a summer yard.

One new Brewer crusher; has never had a shovelful of clay through it, latest 1899 pattern.

One Carnell No. 2 hand brick press; this press has been used but very little; to press about 25,000 to 50,000 brick.

One 8-foot Penfield horizontal pug mill; in good order.

One O. Barber standard sewer pipe press, with dies running from 3 to 24 inches, inclusive; also trucks, drums, etc.

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One Penfield No. 7 stiff mud brick and tile machine; has full set of tile dies up to 12 inches. This machine has been but very little used.

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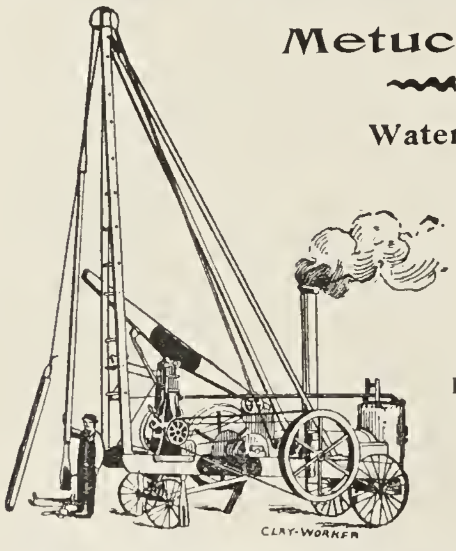

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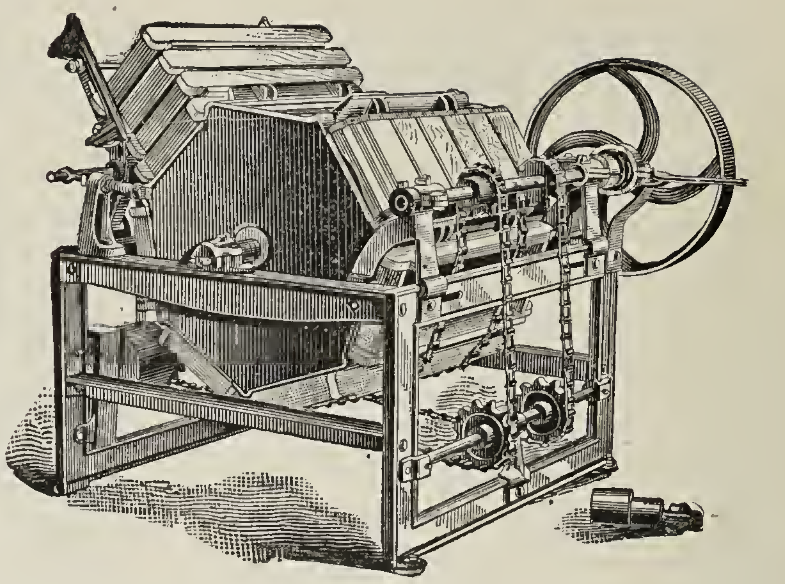
CHAMPION Brick Mould SANDING MACHINES.



No expensive belts, aprons or gearing to wear out. Simple, strong and serviceable. It is the heaviest and strongest sander on the market. It weighs about 1,300 pounds.

My machine, with the molds riding upon the cylinder, keeps the molds out of the sand and so does not mix clay and dirt in the sand. It does its work quicker and cleaner, with less wear and tear, and leaves less sand on the bricks than any other machine made and at the same time uses less sand and runs with less power.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.

We own and control nine U. S. Letters Patents Nos. 284,115; 290,847; 301,087; 385,790; 322,455; 372,698; 327,711; 407,030 and re-issue No. 10,976, and all sanding machines employing either the cylinder or feed rack infringe one or more of these patents.

The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been successful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

Our machines are the best and the title to them is perfect. All persons are warned not to purchase such machines from any other manufacturer, as suit will be commenced at once for damages and injunction against all infringers.

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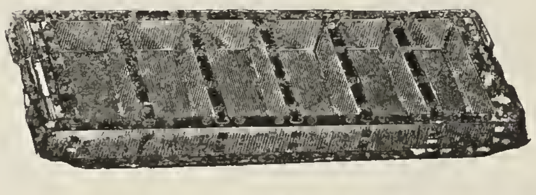
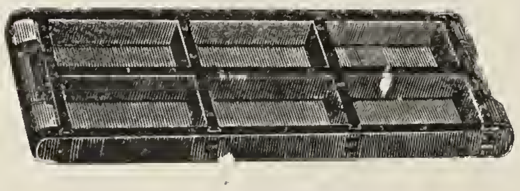


6 Brick Machine Mold.



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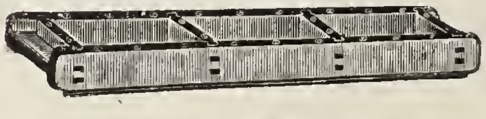

3 Brick Hand Mold.

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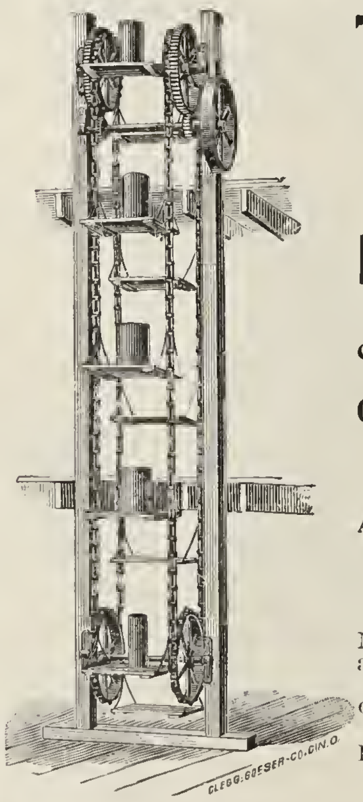

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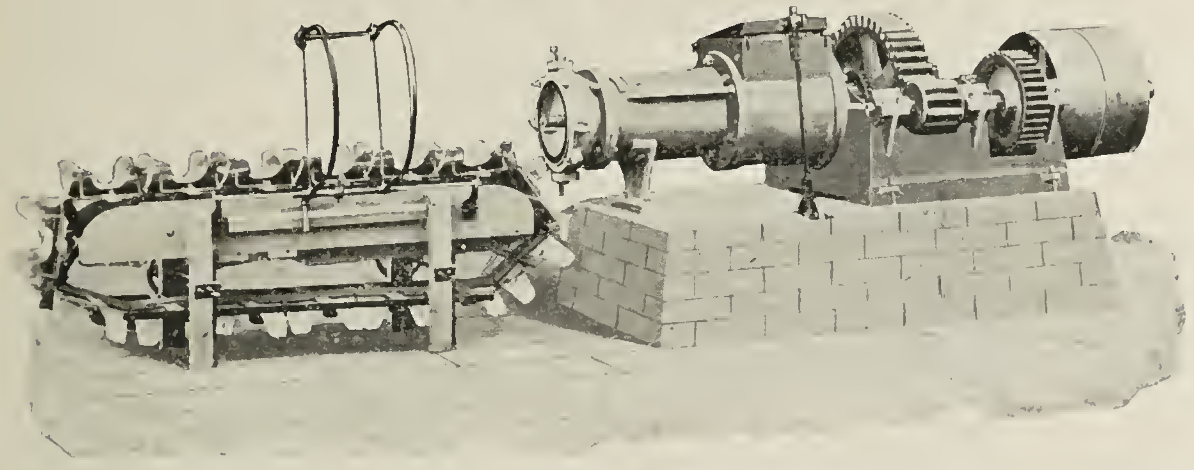

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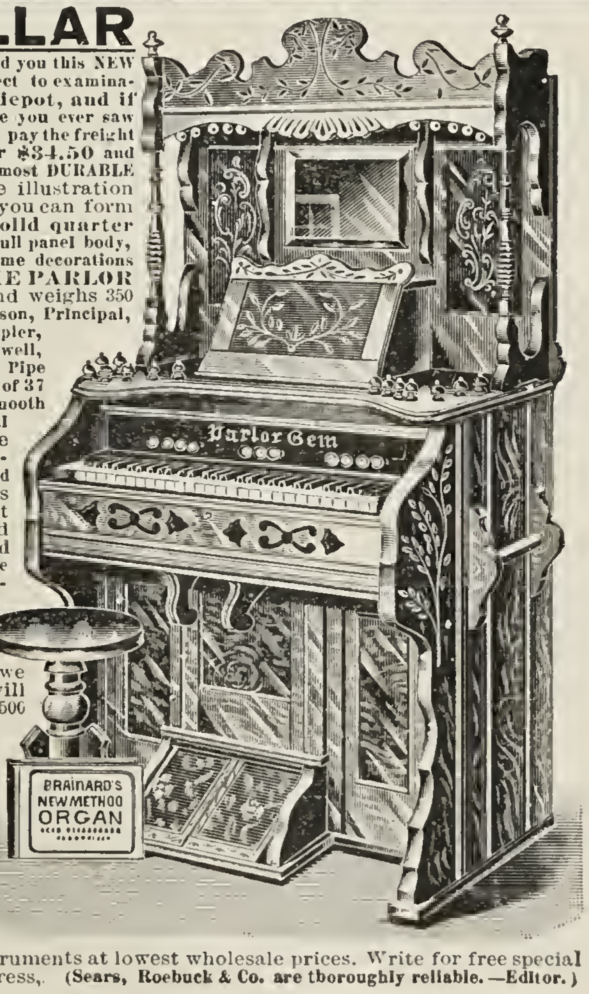

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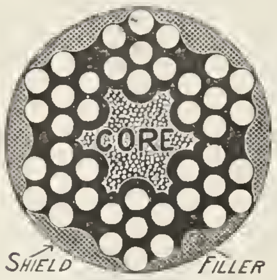

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Catalogue P tells how.

The IRONSIDES CO.,
Columbus, Ohio, U. S. A.

GABRIEL & SCHALL

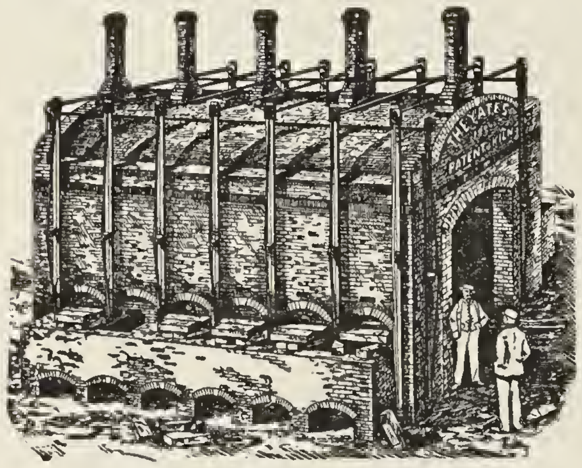
P. O. Box 2654. 205 Pearl Street.
NEW YORK.

Sole Importers in the United States of the

Precipitated K.B. W.F.&C. Carbonate of Barytes

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.



For Economy of Fuel and Percentage of Hard Burned Brick,

This kiln has no equal. Construeted to burn without smoke and give an even distribution of heat, producing uniform burns.
Hot air dryer. Continuous and Muffle Kiln.

ALFRED YATES,
JOHNSONBURG, PENN

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THE DOTS IN OUR HALFTONES

HAVE A SHARP PRINTING QUALITY. SEND FOR '98 CATALOG

INDIANAPOLIS ENGRAVING AND ELECTROTYPING CO.

COX'S Special Drawn Coil Wire is unsurpassed for Strength and Durability.

BRICK AND TILE CUTTING WIRES

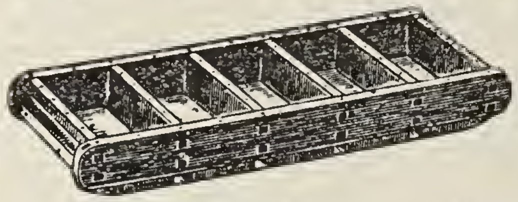
For End Cut, Side Cut and Automatic Tables. Satisfaction Guaranteed. Send for samples and prices.

GEO. S. COX, East Liverpool, Ohio.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE **MOULDS**



We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

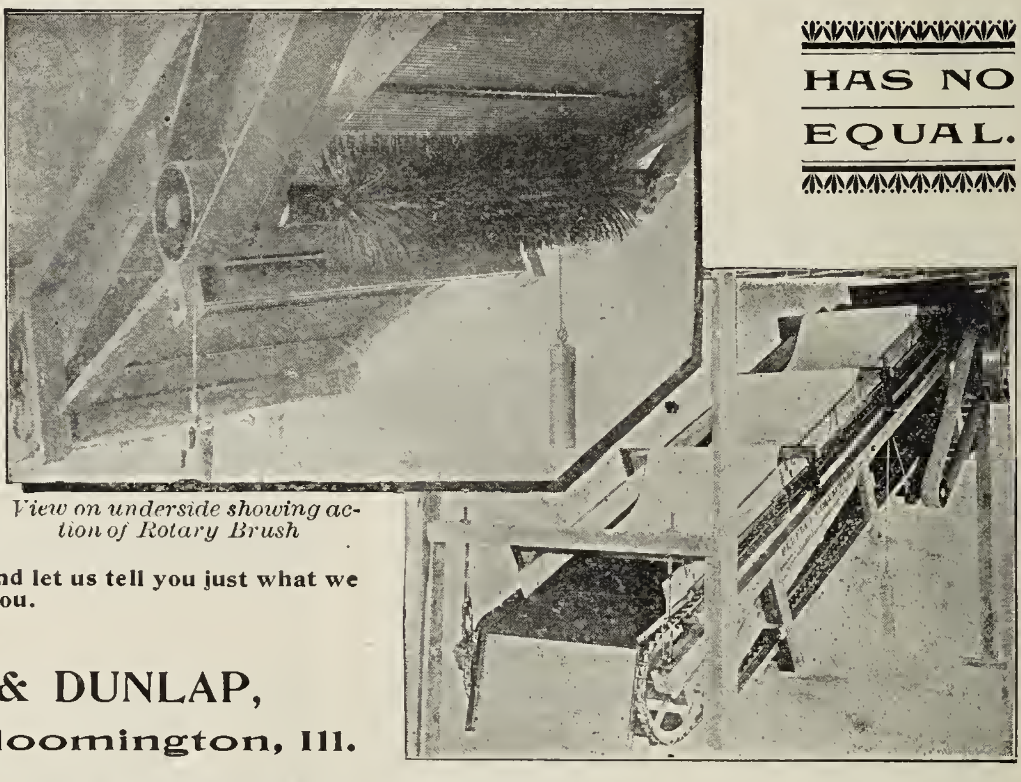
A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.

The PERFECT CLAY SCREEN.

HAS NO EQUAL.

This Screen positively Saves one man.
Increases grinding capacity.
Gives a finer grade of clay
Does the work as well in cold weather as in warm.
Screens cold moist clay as well as dry.
It will more than save its cost in one Winter.



View on underside showing action of Rotary Brush

Drop us a line and let us tell you just what we can do for you.

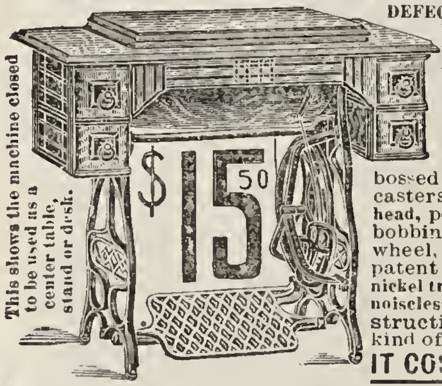
ELDER & DUNLAP,
Bloomington, Ill.

SEND NO MONEY WITH YOUR ORDER, cut this ad. out and send to us, and we will send you OUR HIGH GRADE DROP CABINET BURDICK SEWING MACHINE by freight, C. O. D. subject to examination. You can examine it at your nearest freight depot and if found perfectly satisfactory, exactly as represented, equal to machines others sell as high as $60.00, and THE GREATEST BARGAIN YOU EVER HEARD OF, pay your freight agent our Special Offer Price $15.50 and freight charges. Machine weighs 120 pounds and the freight will average 75 cents for each 500 miles. GIVE IT THREE MONTHS' TRIAL in your own home, and we will return your $15.50 any day you are not satisfied. We sell different makes and grades of Sewing Machines at $8.50, $10.00, $11.00, $12.00 and up, all fully described in our Free Sewing Machine Catalogue, but $15.50 for this DROP DESK CABINET BURDICK is the greatest value ever offered by any house.

This illustration shows the machine open, ready for use.

BEWARE OF IMITATIONS by unknown concerns who copy our advertisements, offering unknown machines under various names, with various inducements. Write some friend in Chicago and learn who are reliable and who are not.

THE BURDICK has every MODERN IMPROVEMENT, EVERY GOOD POINT OF EVERY HIGH GRADE MACHINE MADE, WITH THE DEFECTS OF NONE. Made by the best makers in America, from the best material money can buy.



This shows the machine closed to be used as a center table, stand or desk.

SOLID QUARTER SAWED OAK DROP DESK CABINET, piano polished. One illustration shows machine closed (head dropping from sight) to be used as a center table, stand or desk, the other open with full length table and head in place for sewing. 4 fancy drawers, latest 1899 skeleton frame, carved, paneled, embossed and decorated cabinet finish, finest nickel drawer pulls, rests on four casters, adjustable treadle, genuine Smyth iron stand. Finest large High Arm head, positive four motion feed, self threading vibrating shuttle, automatic bobbin winder, adjustable bearings, patent tension liberator, improved loose wheel, adjustable pressure foot, improved shuttle carrier, patent needle bar, patent dress guard, head is handsomely decorated and ornamented and beautifully nickel trimmed. **GUARANTEED** the lightest running, most durable and nearest noiseless machine made. Every known attachment is furnished and our Free Instruction Book tells just how anyone can run it and do either plain or any kind of fancy work. A 20-Years' Binding Guarantee is sent with every machine.

IT COSTS YOU NOTHING to see and examine this machine, compare it with those your storekeeper sells at $40.00 to $60.00, and then if convinced that you are saving $25.00 to $40.00, pay your freight agent the $15.50. WE TO RETURN YOUR $15.50 if at any time within three months you say you are not satisfied. ORDER TO-DAY. DON'T DELAY. (Sears, Roebuck & Co. are thoroughly reliable.—Editor.)

Address, SEARS, ROEBUCK & CO. (Inc.) Chicago, Ill.

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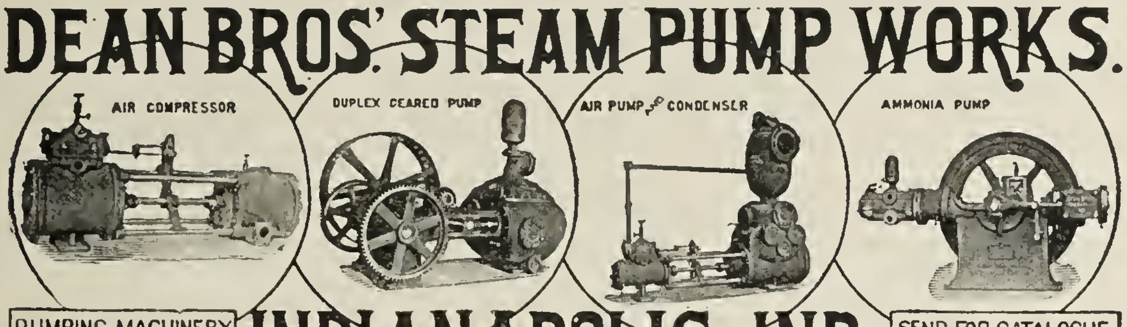
Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio.

ARE YOU making your DRY PRESS BRICK FAST enough, GOOD enough and CHEAP enough? If not, write for particulars to

T. W. CARMICHAEL, Wellsburg, West Va.,

Dry Process Expert and Manufacturer of the Carmichael Clay Steamer, the Carmichael Clay Screen, and dealer in Dry Process Specialties.

DEAN BROS.' STEAM PUMP WORKS.



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CREDIT REPORTS on men who make BRICK, on men who buy BRICK, on men who sell BRICK? Trustworthy service at lowest prices; ordinarily $1.00 for each report.

RELIABLE LIST of BRICK manufacturers and Supply men, in any State, in any Country? These can be furnished at small cost, usually $1.00 for any single list.

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TO KNOW how to sell BRICK to the Government? Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, ASSOCIATED TRADE & INDUSTRIAL PRESS,

ESTABLISHED NINE YEARS. Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.

The Peerless System Up-Draft, Down-Draft and Continuous Kilns

Is the Acme of Perfection in Brick Burning.

READ WHAT THEY SAY ABOUT IT:

LaPrairie Pressed Brick and Terra Cotta Co., Quebec:

"We have been using two of these rebuilt Kilns for the last two years, and the fact that we are now reconstructing another, demonstrates our Entire Satisfaction with your PEERLESS SYSTEM.

Elmsdale Brick Co., N. S.:

"Never saw a Kiln work so even and free both in watersmoking and burning in all my life. The arches were as good as any other part of the Kiln."

John Cubbins Sons, Memphis, Tenn.:

"After burning the first kiln that was changed, the second time, we found the improvement so great and so much Superior to the old updraft kilns, that we are now changing our entire system to your PEERLESS PATENT."

Jacob Kline, Baltimore, Md.:

"Your system of burning good hard brick is without doubt the best I have ever seen."

And there are Others.

No matter what you manufacture, or the capacity of your plant, if your make is of clay and you want it burned, write us for information. If you have kilns that are not giving satisfaction, or from any other cause you cannot burn your ware, write and tell us all you know about the trouble.

J. W. CARSON, Construction Engineer of Brick Works. **Montezuma, Ind.**

What do YOU know about

Bricks, Tiling, Pottery?

WE Know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road

For particulars write
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Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between CINCINNATI, INDIANAPOLIS, DECATUR and SPRINGFIELD, ILL.

Through cars Cincinnati to Chicago via Indianapolis and Roachdale and Monon Route.

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Mail and Express	8.15 a m
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Accommodation	10.40 a m
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NATURAL GAS ROUTE
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Solid Train Between
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—AND—
INDIANAPOLIS and
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Through tickets sold to all points in the United States and Canada.

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South Dakota	**Kentucky**
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Presenting an unequaled territory for diversified industries, and possessing

Fine Sites for New Mills,
Best of Freight Facilities--Coal Fields--Close Proximity to Distributing Centers.
Intelligent Help of all Kinds.
Many Kinds of Raw Material.

To sound industries, substantial inducements will be given by many of the places concisely described in the pamphlet "100 Cities and Towns Wanting Industries." Write for a copy. Nearly all kinds of industries are wanted. Very liberal inducements are offered Textile Industries in the South by a number of good places. GEORGE C. POWER, Industrial Commissioner I. C. R. R. Co., Chicago.

ONLY $2.75

SEND NO MONEY. Cut this ad. out, and send to us, state your weight and height, also number of inches around body at bust and neck, and we will send this **BEAUTIFUL FUR TRIMMED BEAVER CLOTH CAPE** to you by express, C.O.D., subject to examination. You can examine and try it on at your nearest express office and if found perfectly satisfactory, exactly as represented and the most wonderful value you ever saw or heard of, pay the express agent our special offer price **$2.75,** and express charges. Express charges will average 40 to 60 cents for each 1,000 miles. **THIS CAPE IS LATEST STYLE FOR FALL and WINTER,** made from an extra fine and heavy all wool black or blue genuine Rariton Beaver cloth, 27 inches long, very full sweep, 13-inch upper cape, extra full. Upper cape and large storm collar, beautifully trimmed with black Baltic seal fur; upper cape trimmed with three rows and collar with two rows of fine mohair braid; cloth button ornaments. This cape is fine tailor made throughout and equal to capes that sell at more than double the price. Write for free Cloak Catalogue.

SEARS, ROEBUCK & CO., CHICAGO

(Sears, Roebuck & Co. are thoroughly reliable—Editor.)

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THESE ARE WHAT WE ENGRAVE ON:

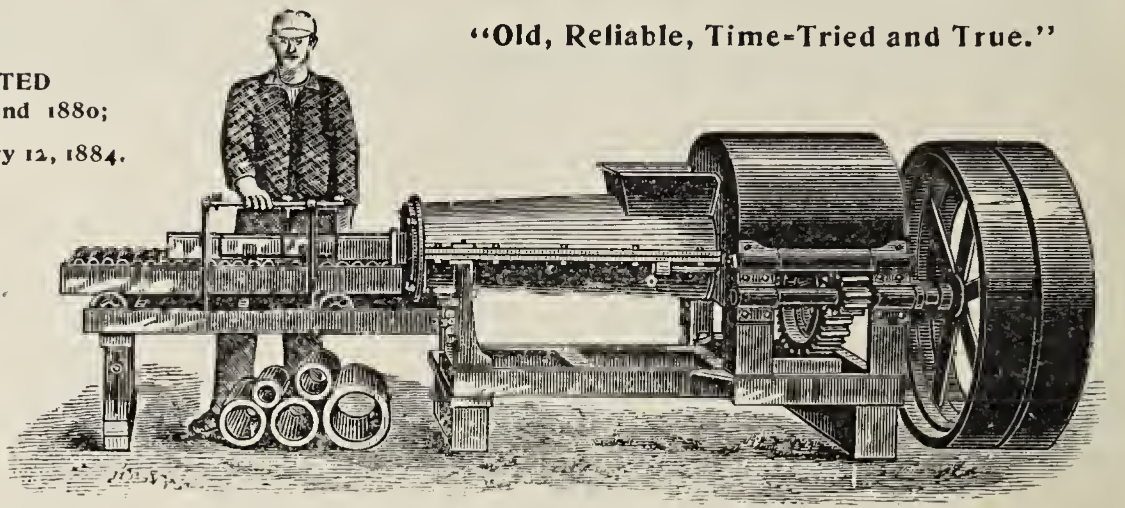
REMEMBER: ONLY FIRST QUALITY.

INDIANAPOLIS ENGRAVING AND ELECTROTYPING COMPANY.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

"Old, Reliable, Time-Tried and True."

PATENTED
June 22nd 1880; and February 12, 1884.



P. H. Kells, the Original Inventor of the Auger Machine

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amout of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

☞For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

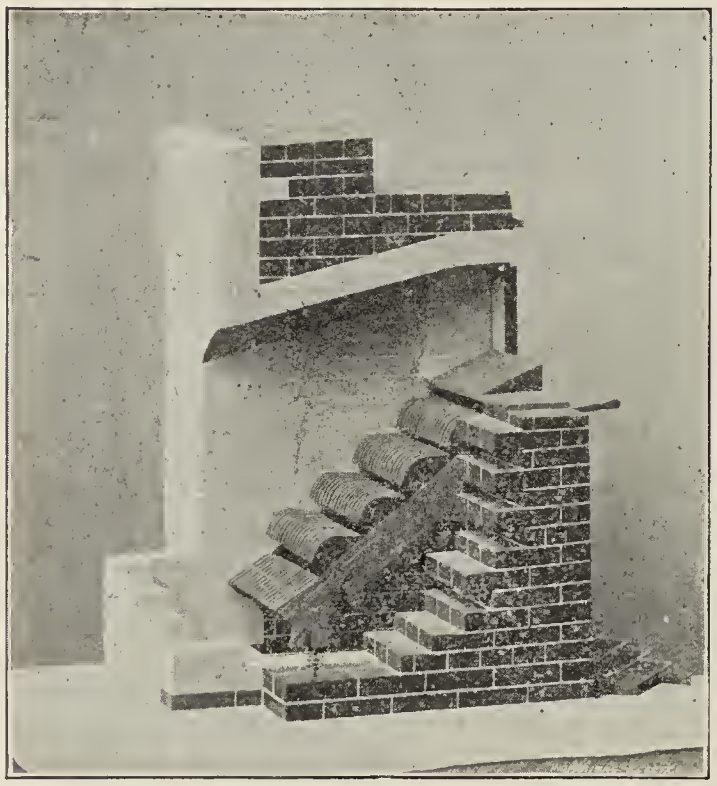
H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

The ALSIP IMPROVED.... KILNS

Have more points of superiority than any others on the market. Will be pleased to tell you all about its merits.



PATENTED.

The ALSIP KILN Furnace Grate,

Can be attached to any style of kiln furnace.

It is a coal coker and a gas generator.

Is self cleaning and has a gradual feed.

Is simple and durable.

Nothing but coal slack needed for fuel.

Guaranteed to save labor and fuel.

Investigate and be convinced.

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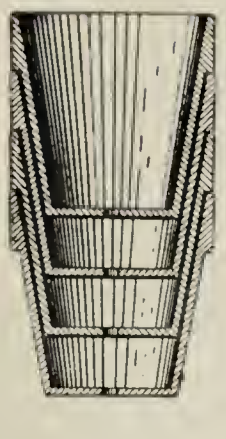

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WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,
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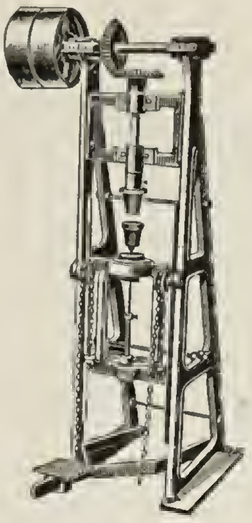

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If you are earning less than $75.00 per month and appreciate an independent position at which you can earn $150.00 and expenses per month (and many of our active men make more) you should communicate with us immediately.

IT COSTS YOU NOTHING TO WRITE US AND LEARN OF THE EXCEPTIONAL OPPORTUNITY WE OFFER TO THE RIGHT MAN.

WE WANT MEN EVERYWHERE. We want an active, industrious, reliable salesman in every town. We furnish **FREE OF CHARGE** everything required to place you immediately in position to earn **BIG WAGES** at high grade employment and keep you busy every day in the year, except Sundays.

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SCHOOL TEACHERS, MINISTERS
AND MEN WHO HAVE HAD
NO PREVIOUS EXPERIENCE

ARE ON OUR LISTS OF SUCCESSFUL AGENTS.

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NO CAPITAL
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NO RISK
NO COMMISSION PLAN
NO HOUSE-TO-HOUSE CANVASS

NO COMPETITION

NO MORE TIME and attention than you would put in to make a living at anything, will make for you

NO LESS THAN $5.00 A DAY SURE.

WE ARE THE WORLD'S LARGEST TAILORS. We buy our cloth direct from the **LARGEST AMERICAN AND EUROPEAN MILLS.** We control the entire output of several of these mills. We own our materials at the lowest possible cost, and operate the most extensive and economic tailoring plant in existence, and cut to measure and make to order **Suits and Overcoats from $5.00 to $15.00** (mostly $5.00 to $10.00). **Pants from $1.50 to $5.00. Fancy Vests from $2.00 up.** The days of ready-made clothing are numbered. **AT THESE PRICES** everyone will prefer to have his garments cut to his measure and made to his order. **NO DIFFICULTY IN GETTING ORDERS.**

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NEARLY ALL OUR MEN MAKE $40.00 EVERY WEEK IN THE YEAR.

THE OUTFIT IS ABSOLUTELY FREE. **We make no charge for our complete Agent's Sample Book and Outfit,** but in order to protect ourselves against many who might impose on us by sending for the outfit (which costs us between $5.00 and $6.00), with no intention of working, but merely out of idle curiosity, we require each applicant to fill out the blank lines below, giving references, and further agree to pay a **temporary deposit of One Dollar and express charges** for the outfit when received, if found exactly as represented and really **a big money maker.** While this nominal deposit of **$1.00** for the outfit is not one-fifth of its cost it insures the good faith of applicants, **and we promptly refund your $1.00 as soon as your sales amount to $25.00,** which amount you can take the first day out.

AMERICAN WOOLEN MILLS CO. OF CHICAGO.

REFERENCES:
Corn Exchange National Bank
Any Express or Railroad Company
Any business man or resident

Fill out the following lines carefully, sign your name, cut out and send to us, and the outfit will be sent you at once.

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....	....
Sign your name on above line.	
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Name of Postoffice, County and State on above line.	On above two lines give as references, names of two men over 21 years of age who have known you one year or longer.
Your age..	
Married or single....	....
	In above line give name of your nearest express office.

Address your letters plainly to
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(American Woolen Mills Co. are perfectly responsible, we know them personally.—Editor.)

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ALSO BEST LINE TO DENVER.

Acknowledged by all to have the Best Dining Car Service.

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For handsome book, "MANITOU AND THE MOUNTAINS," address
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It tells WHERE THE MARKETS ARE and by whom supplied.

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It can ascertain FOR YOU the particular REQUIREMENTS of any or all markets in THE LINE OF GOODS YOU MAKE.

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This is a movement in the Interest of American Commerce with which YOU SHOULD BE IDENTIFIED.

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Are now recognized as equal to the best paving brick produced in this country. There is no better paving material than shale brick and Thurber brick are made of the best shale, by improved methods that insure a uniform product—that is unexcelled for wearing qualities. We guarantee them fully. Send for samples, prices, etc.

FINE FACE and HIGH GRADE VITRIFIED PAVING BRICK a Specialty.

GREEN & HUNTER BRICK COMPANY,

Factory at Thurber, Texas.

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The HARPER-NORTIN SHALE BRICK CO.,

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MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

Present capacity ten million. We are now prepared to furnish fine vitrified paving and extra hard foundation brick in any quantity. Correspondence solicited.

New York Brick & Paving Co.,

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VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

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204 S., A. & K. BUILDING.

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Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO.,
Publishers,
INDIANAPOLIS, IND., U. S. A.

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The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

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The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

OFFICE: 306 Opera House,
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The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

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Office and Works: Clinton, Ind.

J. L. HIGLEY & CO.,

CANTON, OHIO.

Four of the largest and best paving brick plants in the world.

Canton Paving Block,

Head the list for uniformity, finish and wearing qualities.

Samples sent free on application.

Write for prices.

T. B. McAVOY, PRESIDENT. FRANK B. McAVOY, SEC. AND TREAS.

McAvoy Vitrified Brick Co.,

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Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

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WORKS:—PERKIOMEN JUNCTION, PENN.

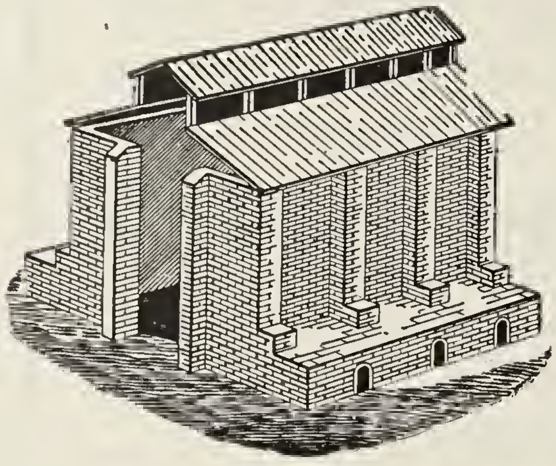
The Bushong Down Draft Kiln

Is so constructed that the **heat** is **equally distributed** to **all parts** of the **Kiln.**

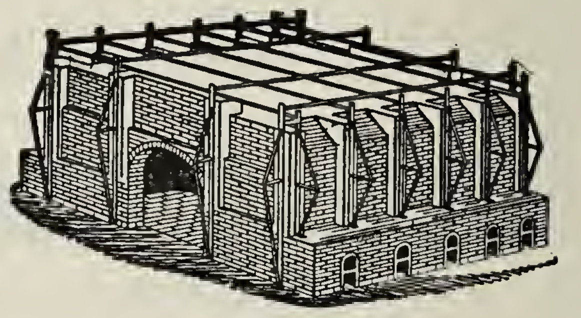
For **uniform** and **all hard burning** this kiln leads them all. Built any size desired. This kiln is now being used by some of the largest brick plants in the country.

For further particulars, address

M. M. BUSHONG, - Phoenixville, Pa.



Up-Draft Kiln.



Down-Draft Kiln.

LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, **2,422 Chestnut St.,** ***Kansas City, Mo.***

MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,

P. O. Box 335. ***ROME, GA., U. S. A.***

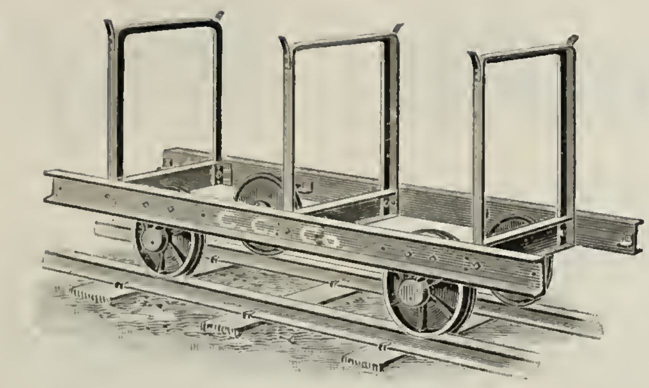
HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

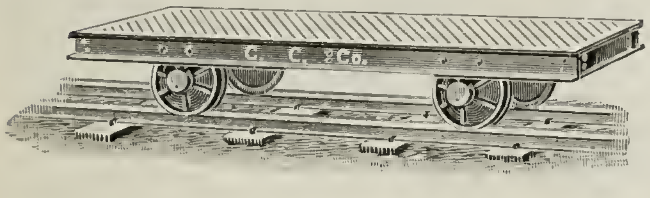
DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**



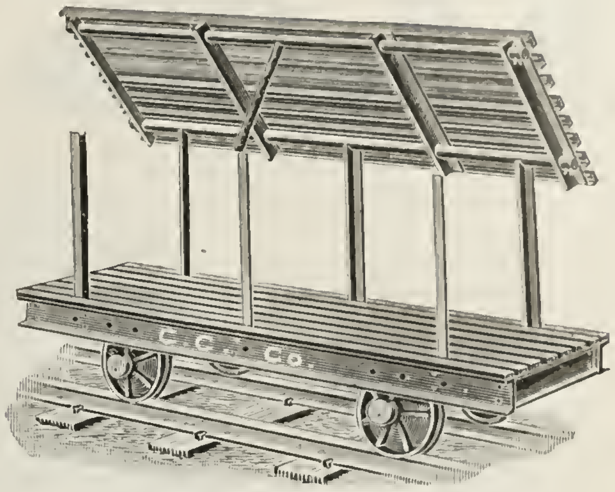
No. 231 DOUBLE DECK.



No. 214 SINGLE DECK.

CHANNEL STEEL BRICK CARS.

Quality Unexcelled.
Prices Reasonable.



No. 232 DOUBLE DECK, with Steel Decks.

Cleveland Car Co.,
150 Scranton Ave., CLEVELAND, OHIO.

Please Mention The Clay-Worker.

Have You Ever Considered This?

That a Very Small Quantity of

Dixon's Ticonderoga FLAKE GRAPHITE.

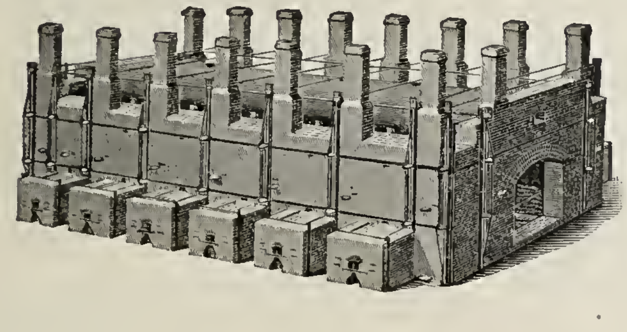
Say 5 to 10 per cent. added to the grease or oil that you are now using, will make you oil or grease do three to six times as much work and do it much better.

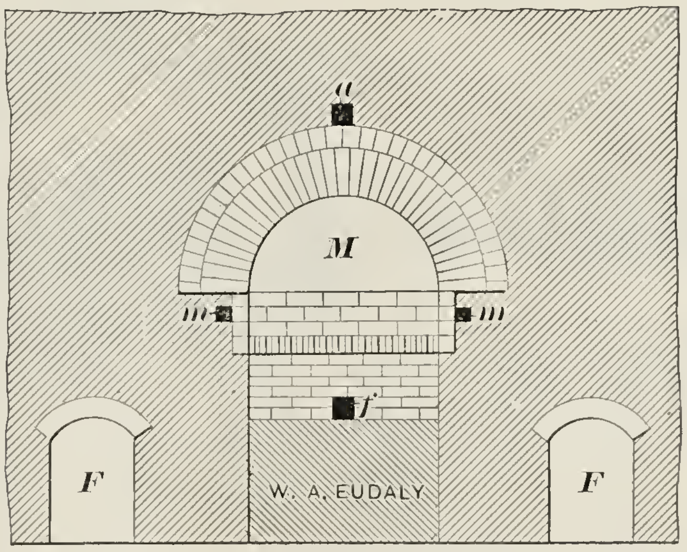
This has been fully demonstrated but if you want to prove it for yourself we will send you samples free of charge and a pamphlet giving full particulars.

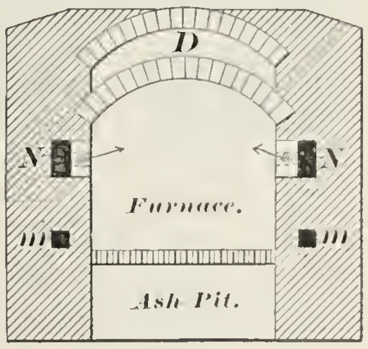
JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.







These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

9 Outfits in One Month. Why?

They are { BUILT RIGHT,
SOLD RIGHT.

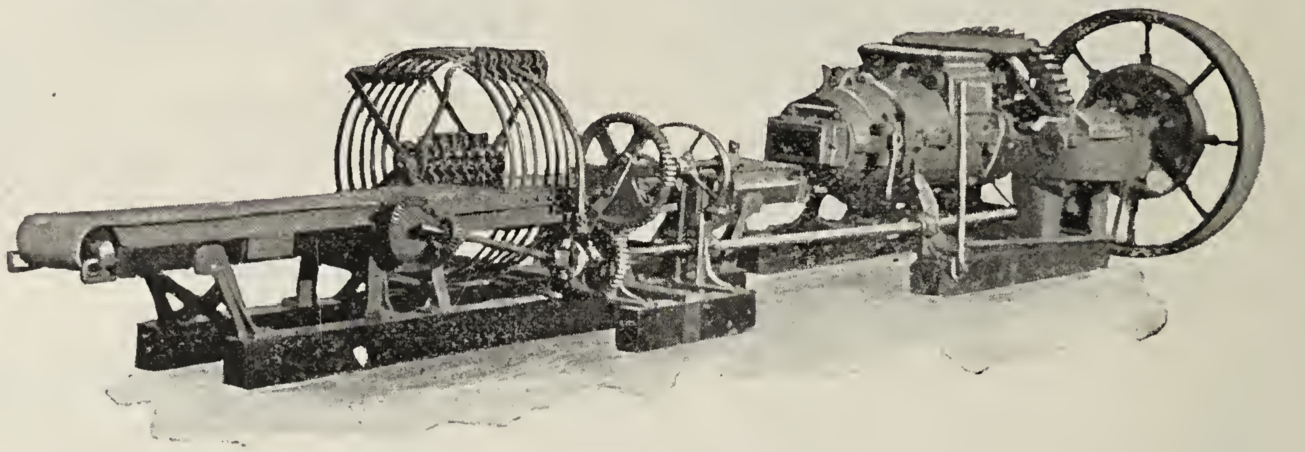
Pendleton, S. C., April 19, '99.

GENTS:

The Automatic Side Cut Table is the finest thing of the kind I have ever seen.

J. C. STRIBLING.

END OR SIDE CUT BY CHANGING REEL FRAME.



X-tra and Automatic Side Cutter.

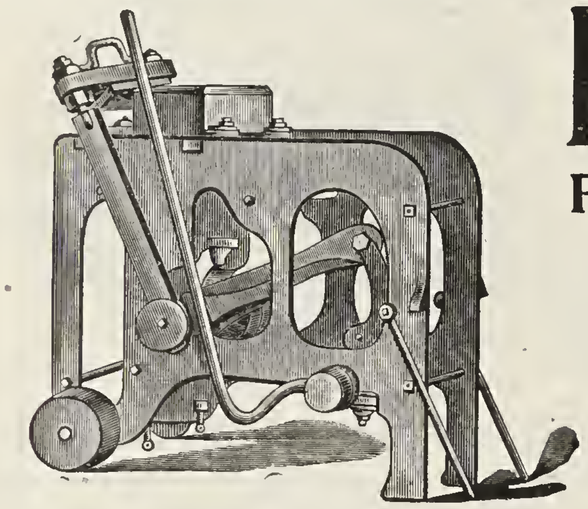
J. C. STEELE & SONS, Manufacturers of The "NEW SOUTH" BRICK MACHINERY, **Statesville, N. C.**

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.

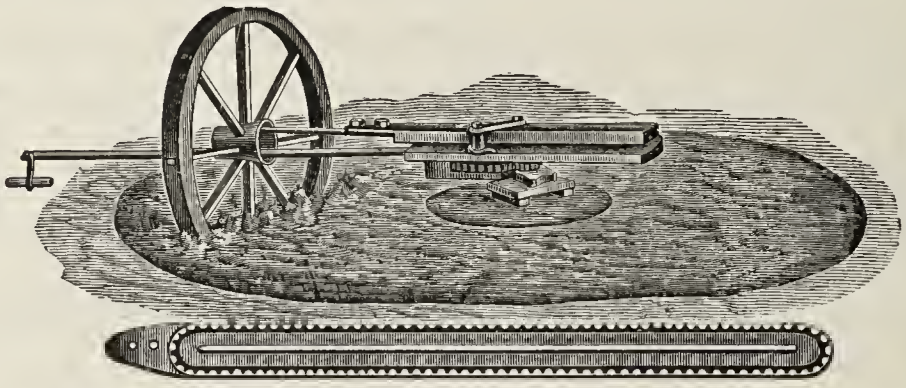


RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

☞ Send for Circular and Price-List.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

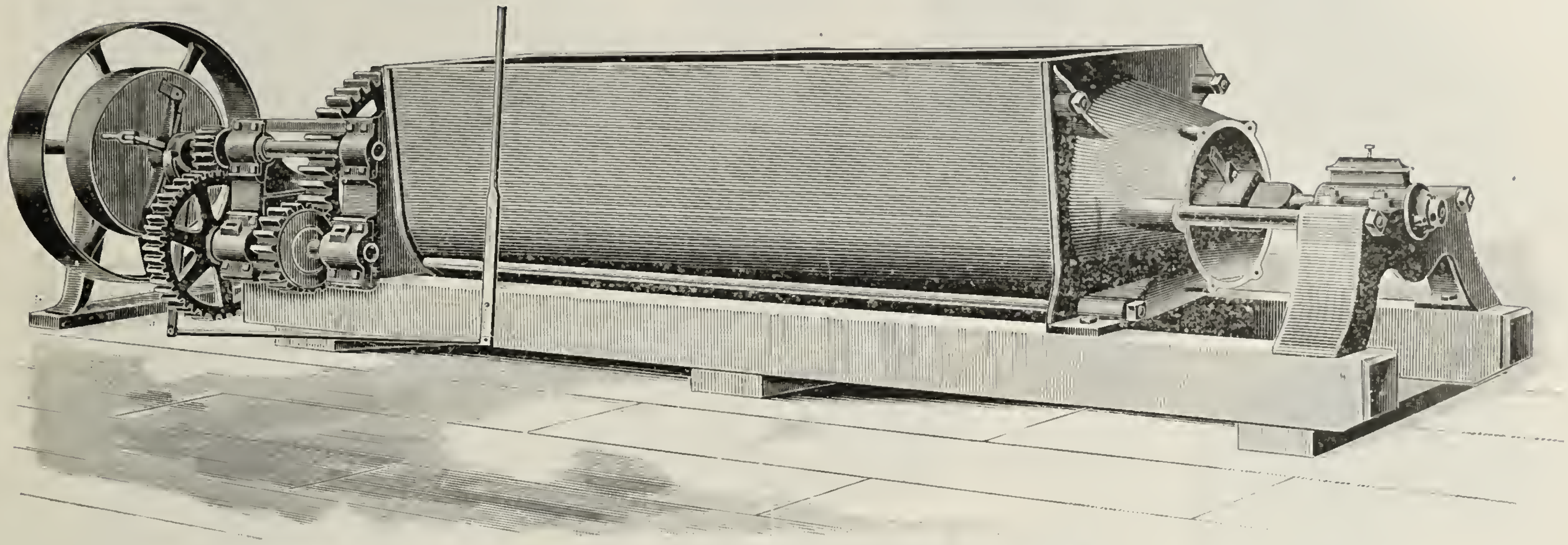
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.

A GOOD THING.



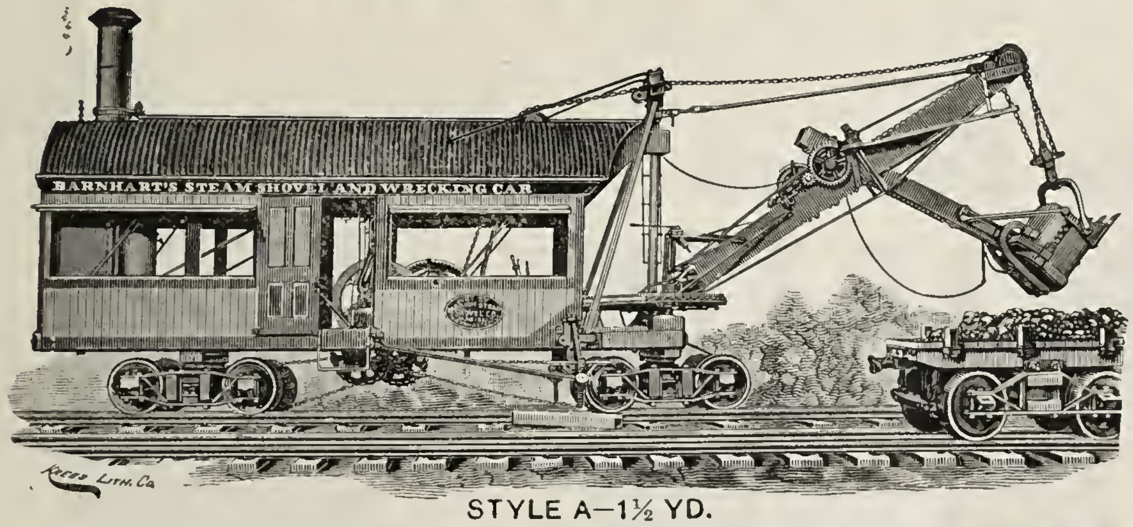
Leader Pug Mill, Size No. 9.

Send for circulars of our **Leader Machinery.**

Brick Machines, Pug Mills, Crushers, Disintegrators, Automatic Cutters, Etc., Etc.

LEADER MANUFACTURING CO., Decatur, Ill.

Steam Shovels for Brickyards.


BARNHART'S STEAM SHOVEL AND WRECKING CAR

STYLE A—1½ YD.

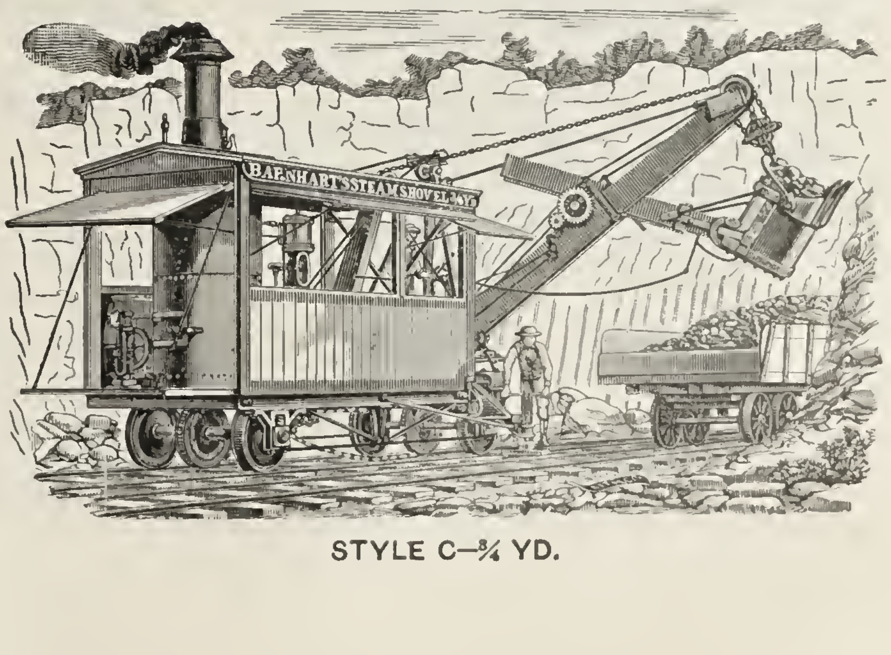
OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

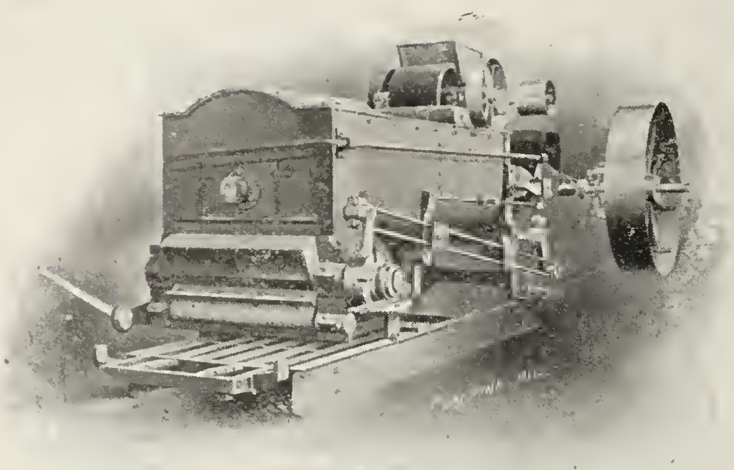
Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**


BARNHART'S STEAM SHOVEL CO.

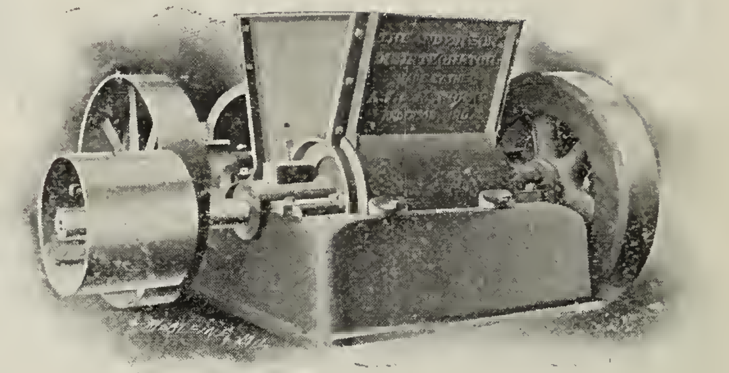
STYLE C—¾ YD.



Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

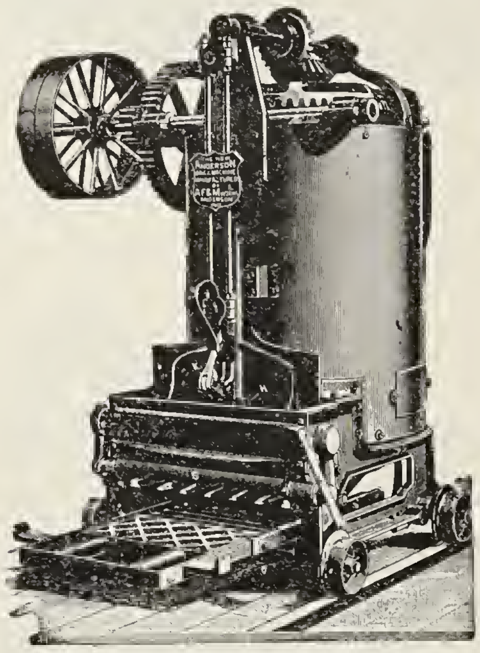
We can save your money.



Best Disintegrator on the Market.

MANUFACTURERS OF....

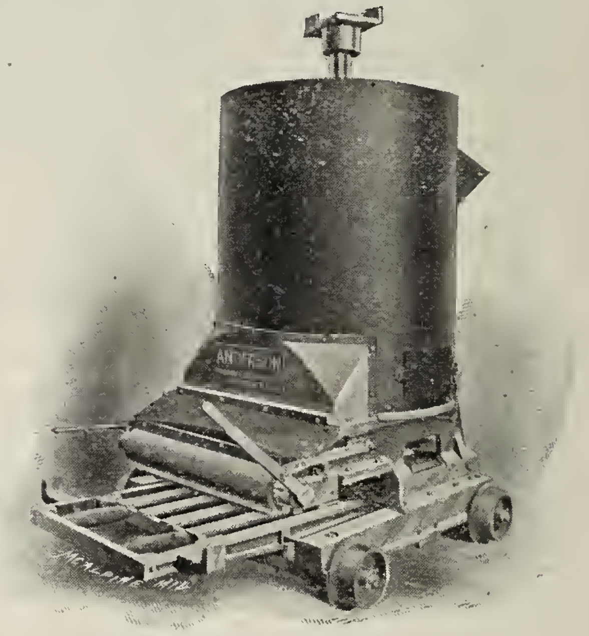
New Departure Tile Machine,



Steel and Iron Upright Stock Brick Machine.

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,
And all Brickyard Supplies.



1899 Horse Power Machine.

The Anderson Foundry and Machine Works,
Anderson, Ind.

THE HENRY MARTIN BRICK MACHINE MFG. CO., INCORPORATED.

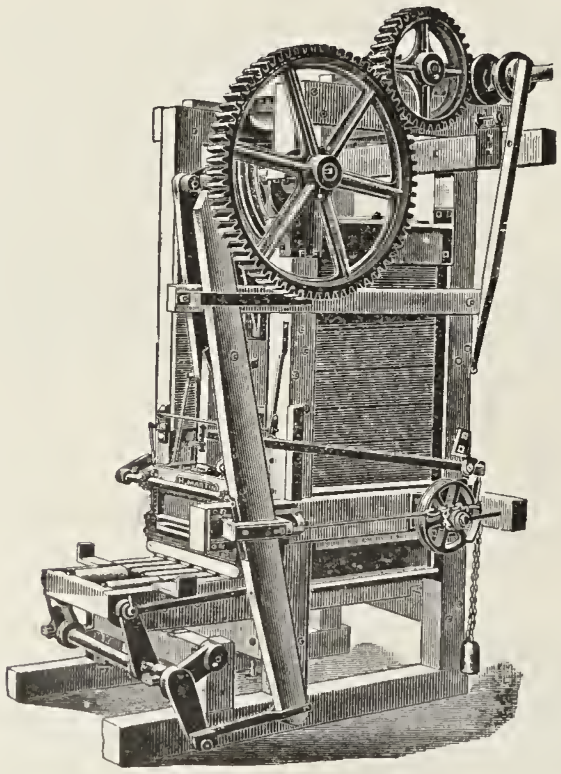
LANCASTER, PENN., U. S. A.

Sole Manufacturers and Exporters of

The Famous "MARTIN" BRICK MACHINERY

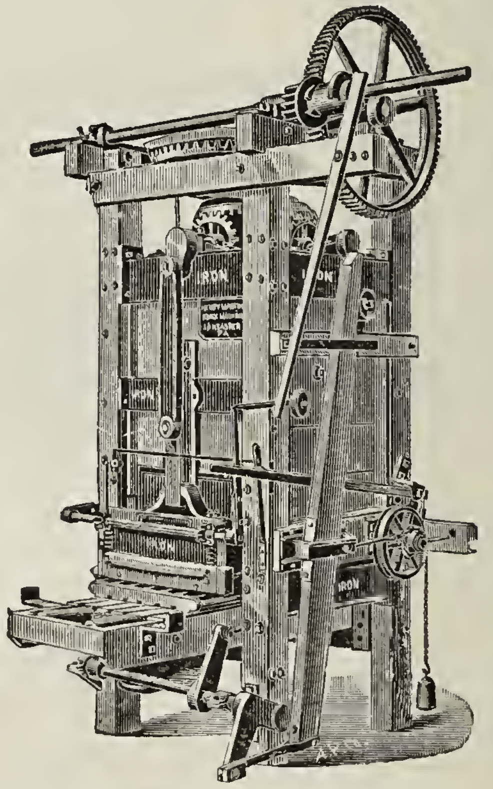
....AND....

BRICKYARD SUPPLIES.



CAPACITY 50,000 PER DAY.

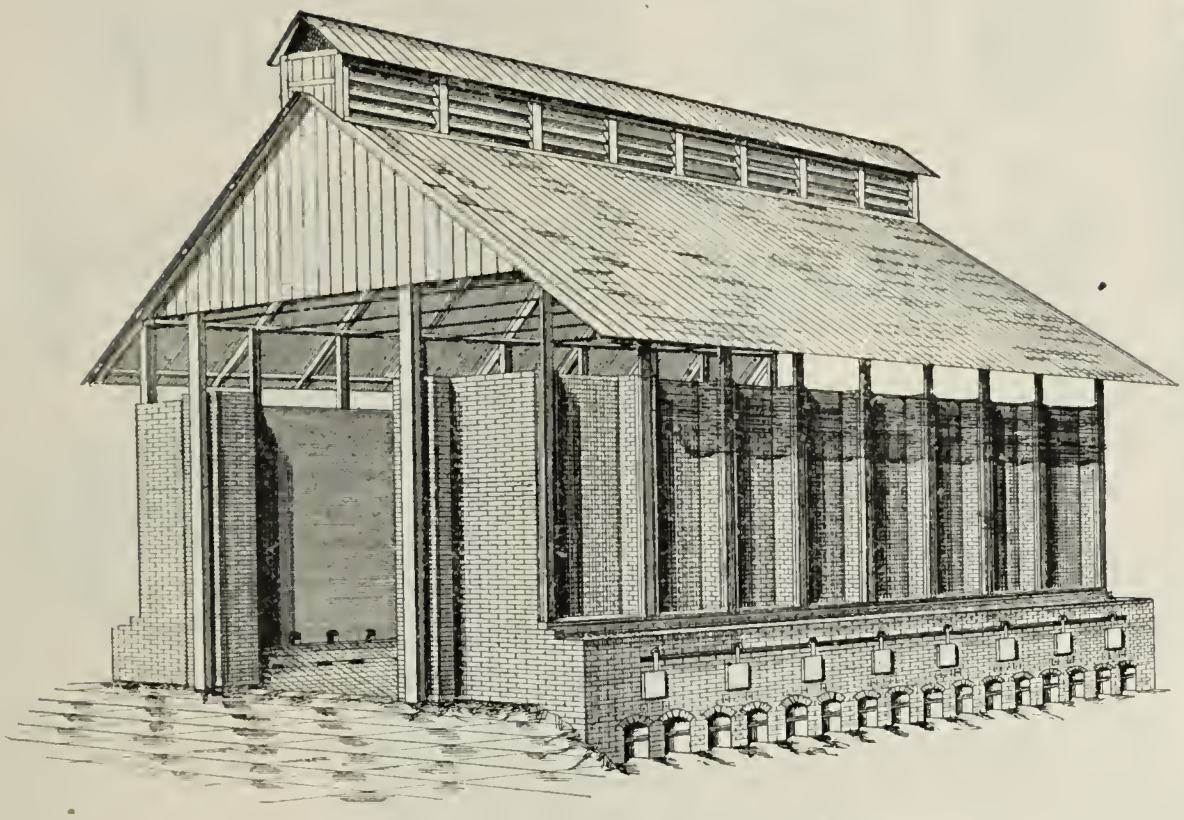
IF YOU Intend adding any new machinery, or changing your plant in any way, it will be $$$$ saved to write us before placing your order.



CAPACITY 35,000 PER DAY

Correspondence Cheerfully Answered.

N. B.--Our Brick Moulds this Year will meet your approval. ORDER A SAMPLE SET.



The GRATH IMPROVED... UP-DRAFT KILN

With Gas and Coking Furnaces Attached.

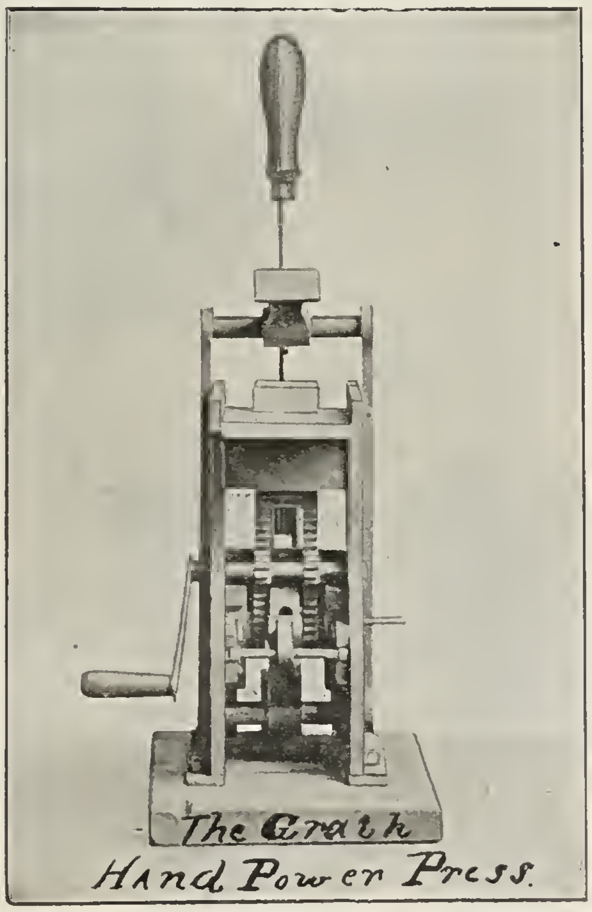
This kiln will burn a larger percentage of face and hard brick than any other Up-Draft kiln in the market, and uses nothing but the cheapest slack coal in the burning.

The Grath Gas and Coking Furnace

Uses nothing but slack coal, is the only Furnace which **thoroughly** cokes all the slack, produces more heat and less smoke than **any** other Coking Furnace attached to either **Up** or Down-Draft Kilns and is guaranteed.

The Grath Dry or Semi-Dry Clay Hand-Power Press

For plain or ornamental press brick, The only successful press of its kind in the market. Simple, durable and powerful. No brickyard complete without this press.



The Grath Hand Power Press.

The Grath Brick Grinding Machine

For grinding Arch and Radius Brick of any hardness, even to a Vitrified brick. Simplest and Best in the market. No sand, no discoloration, which means satisfaction.

The Cheapest Grinding machine in the market

In use by American Hydraulic Press Brick Co., Collinsville, Ill.

* * *

FOR FURTHER INFORMATION ON ABOVE, ADDRESS

The ILLINOIS SUPPLY & CONSTRUCTION CO.,
St. Louis, Mo.

We Lead! Others Follow!

• • •

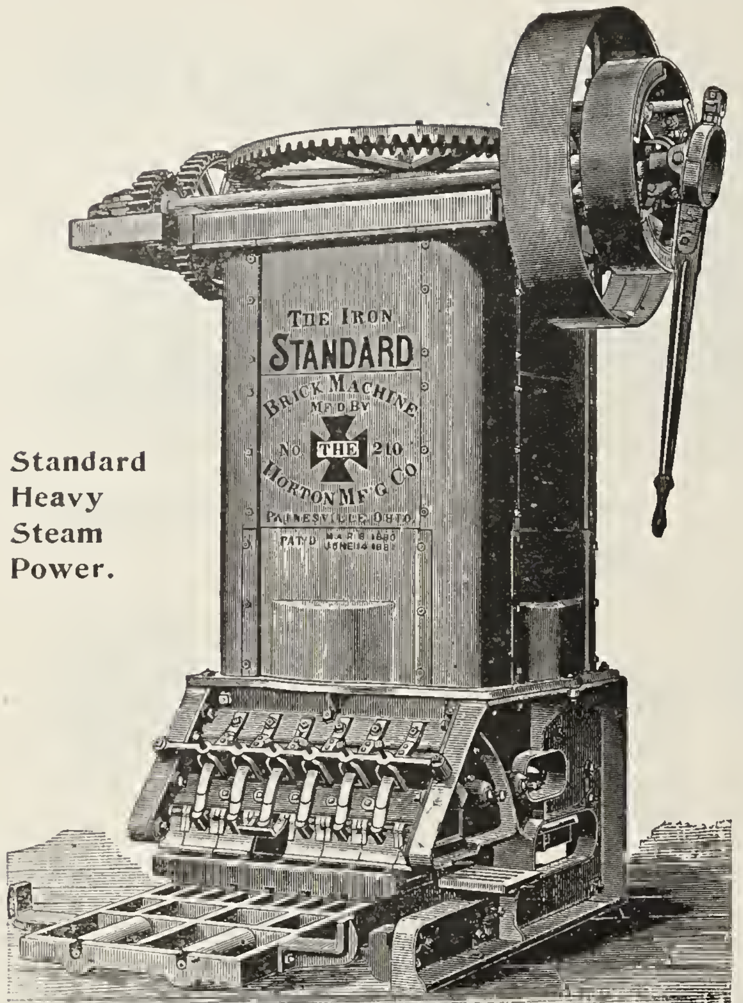
The Hercules!

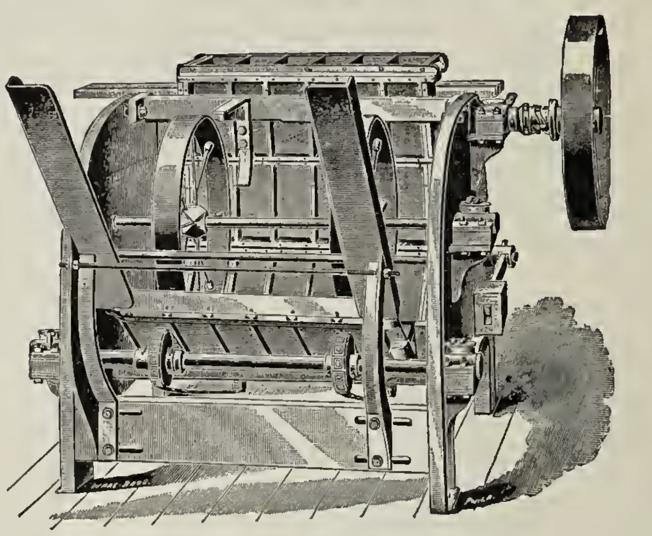
Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

The Standard Machine is just what its name implies.

SEND FOR
1899 CATALOGUE.

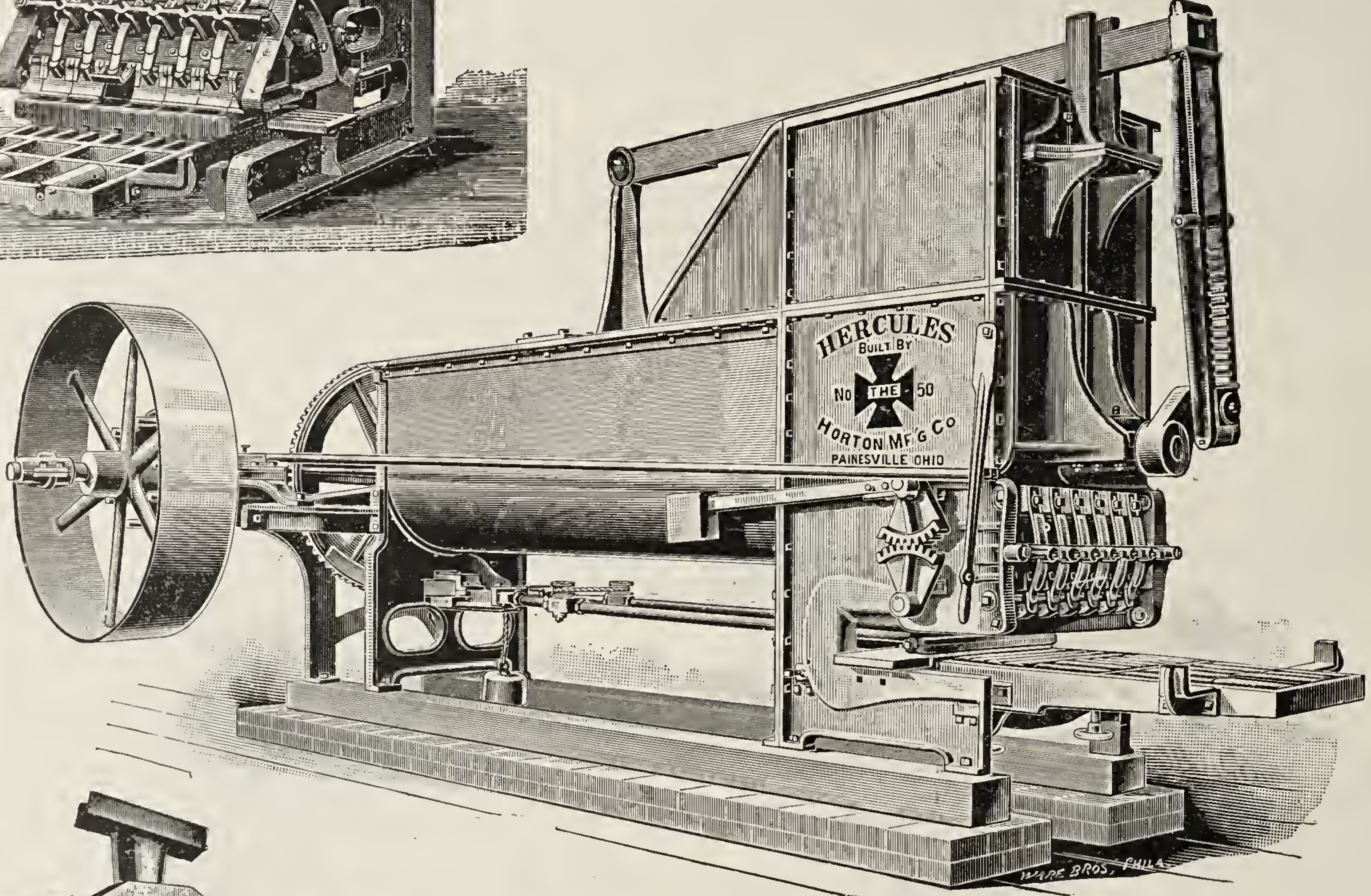
Standard
Heavy
Steam
Power.



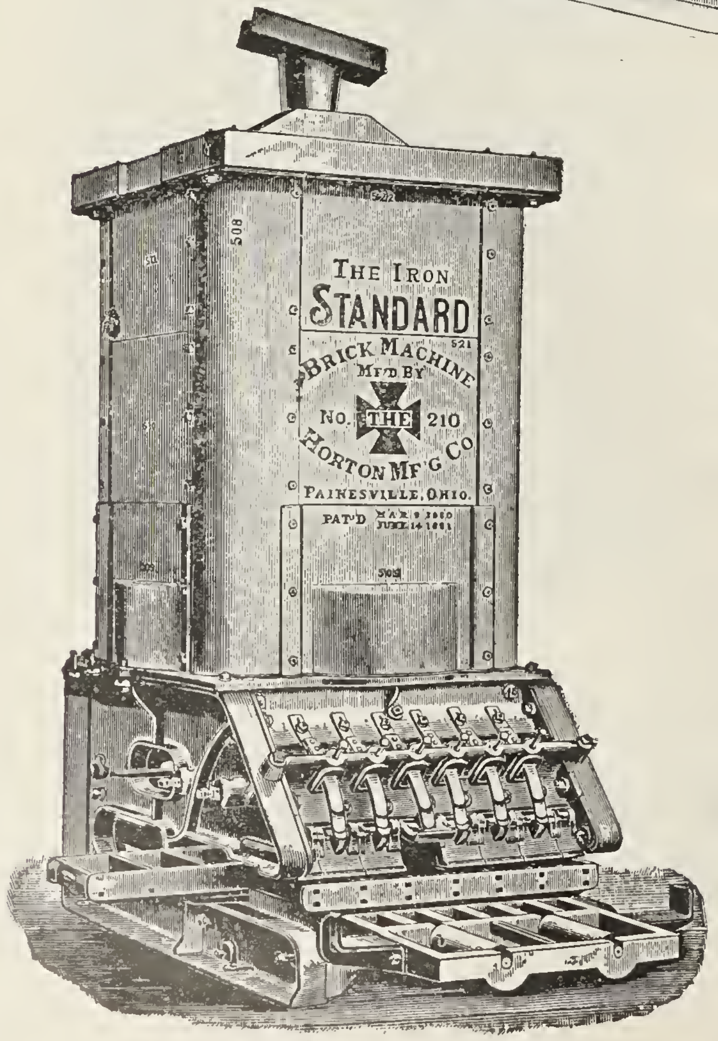


HORTON MOLD SANDER DIRECT FEED.

We are making a special drive on Molds this season. Send for our new circular on molds.



Hercules capacity 40,000 to 50.000.
Weight 15,000 pounds.

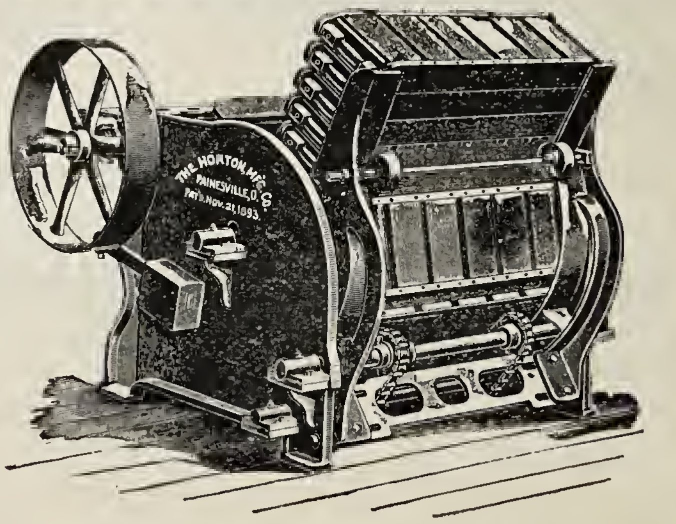


IRON STANDARD HORSE POWER.

WE HAVE, recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.

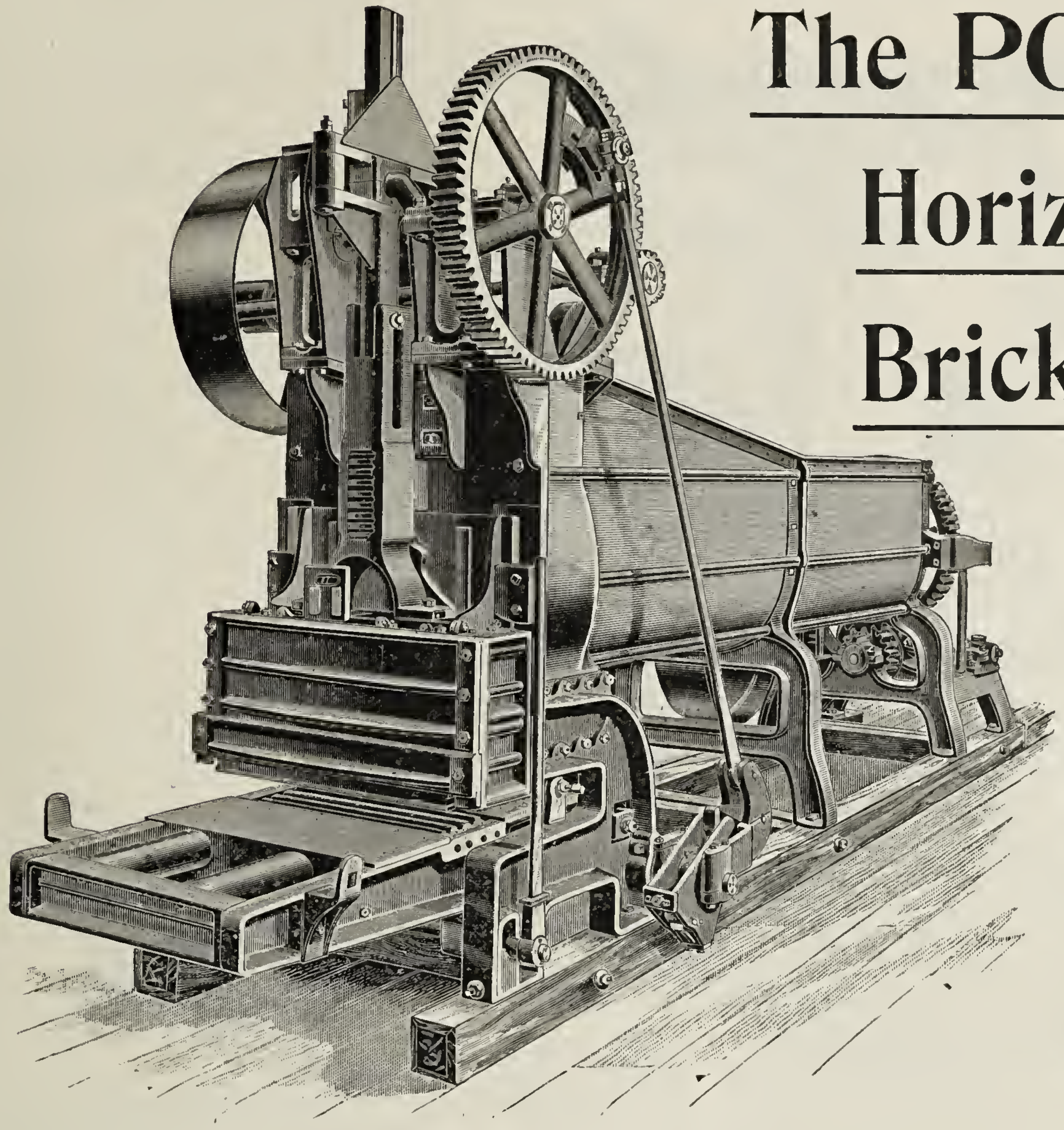
The HORTON MANUFACTURING COMPANY,

PAINESVILLE,
OHIO.


THE HORTON MF'G CO.
PAINESVILLE, O.
PAT'D NOV. 21, 1893.

THE AUTOMATIC FEED MOLD SANDER.

We make a Specialty of erecting Complete Soft Mud Plants.



The POTTS Horizontal Brick Machines,

DISINTEGRATORS

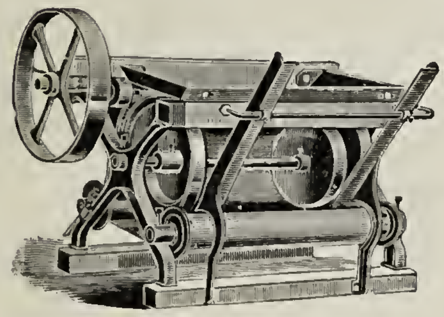
....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

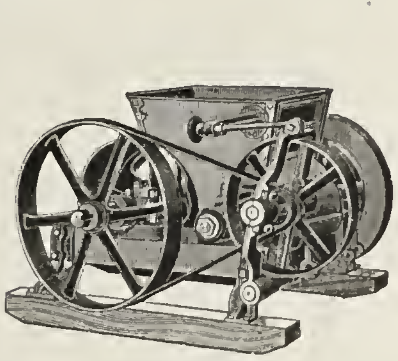
The best built, heaviest and strongest Machinery made.



MOULD SANDERS.

WE MANUFACTURE EVERYTHING NEEDED ON THE BRICKYARD.

WE MAKE A SPECIALTY OF BRICK MOULDS.



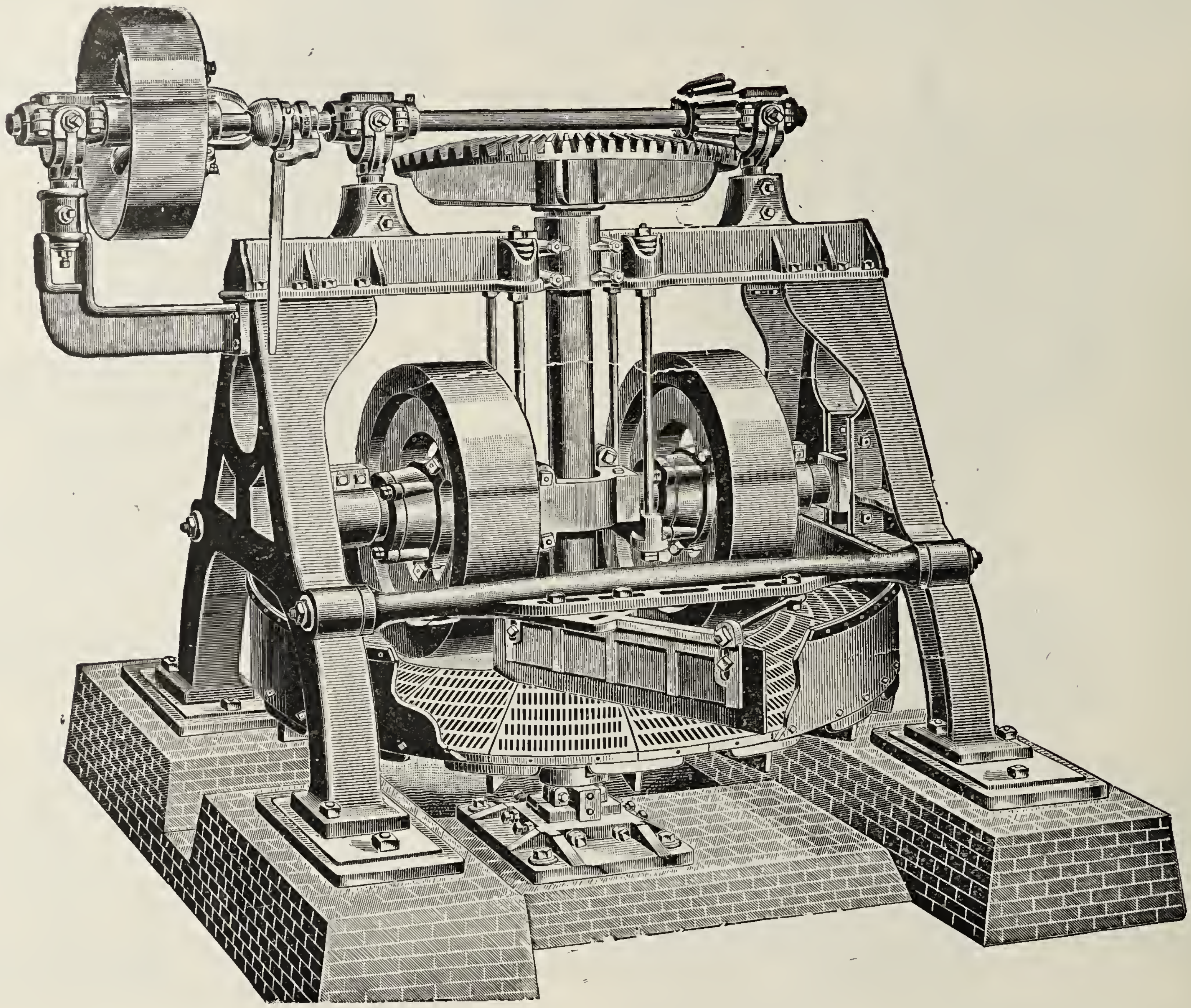
DISINTEGRATORS.

When in need of Machinery or supplies, we can save you money.

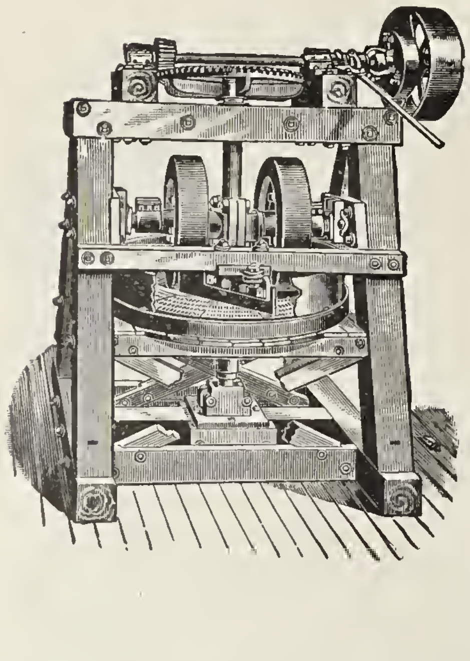
C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE
JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

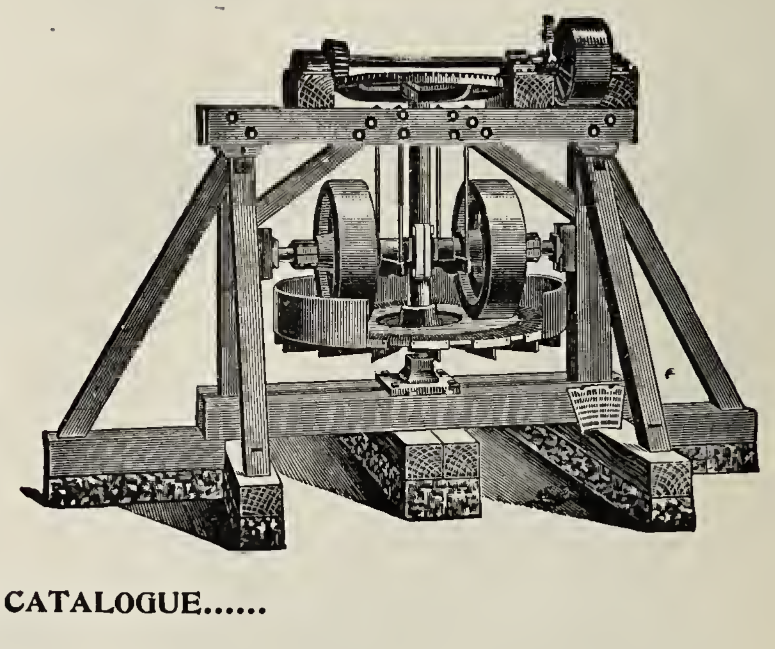


OUR SPECIALTY IS **DRY PANS.**



IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



......SEND FOR NEW ILLUSTRATED CATALOGUE......

FROST ENGINE CO., Galesburg, Ill., U. S. A.

BUILT RIGHT
RUN RIGHT.

It's Not the Name

That makes the fame, but the continued successful operation of the machine.

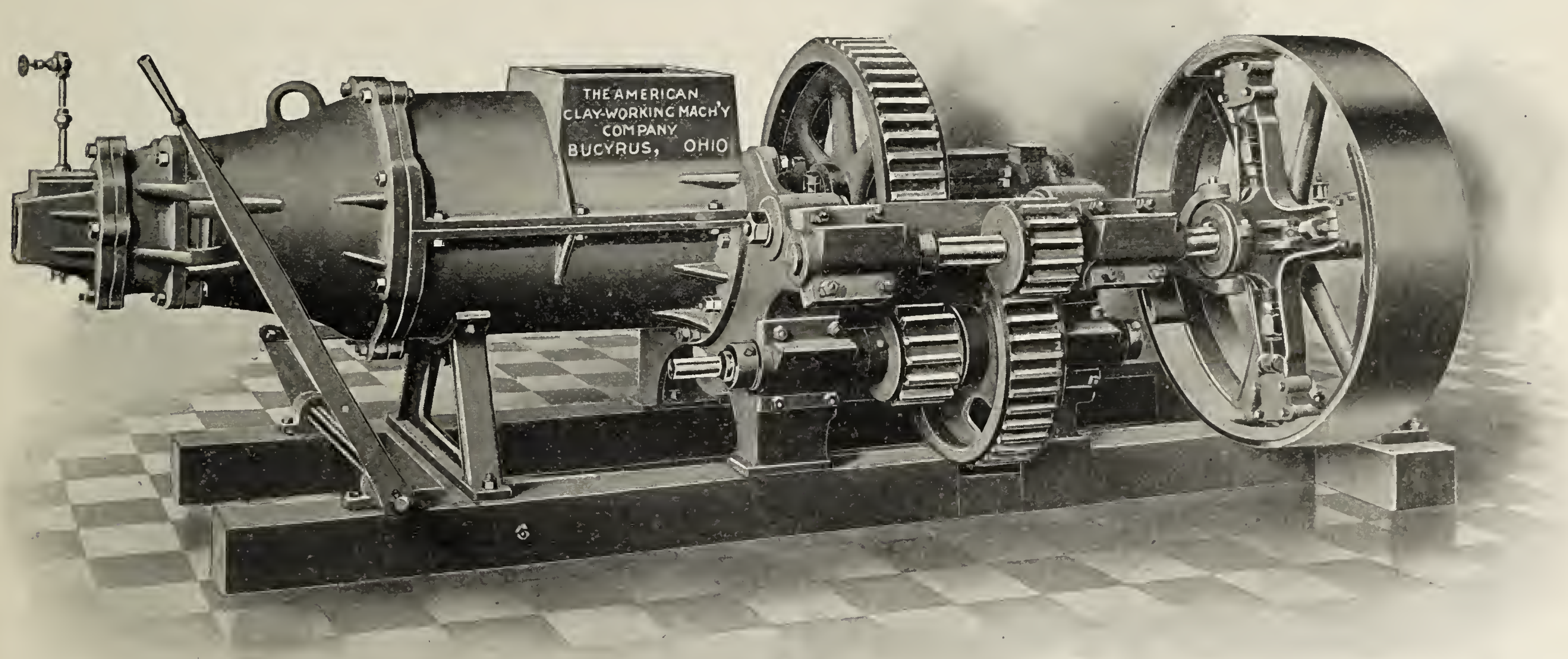
NO AUGER MACHINE has a record that will approach that of the No. 2 Giant. It has by long and faithful use, under the most exacting conditions, won for itself a name and a reputation which is enviable. Manufacturers who have had but indifferent success with other machines have placed a handsome balance on the right side of the ledger by installing the No. 2 Giant. Other machines may turn out as much product in an hour, but it will not last or compare in quality, and quantity without quality ruins instead of makes the reputation of the clay manufacturer. You may as well secure both quantity and quality. It costs no more and when you take into consideration the freedom from delays and repairs you will find the Giant cheaper by far.

Owners of this machine are universal in their praise of it. A prominent manufacturer of the South writes as follows:

> "We are enlarging our plant to take care of the brick as fast as the No. 2 Giant will turn them out. It does more than you claimed for it. If you had made your claim higher, we would have arranged from the first to take care of more brick."

This firm was evidently provoked that we had not made more of a claim for this machine. Our policy is to exceed what we promise, then there are no disappointments.

Send for particulars on the Giant machine; we make them in three sizes. If you are in the market for any clay-working machinery or supplies it will pay you to write us regarding your wants. Drop us a postal and you'll receive a prompt reply.


THE AMERICAN CLAY-WORKING MACH'Y COMPANY BUCYRUS, OHIO

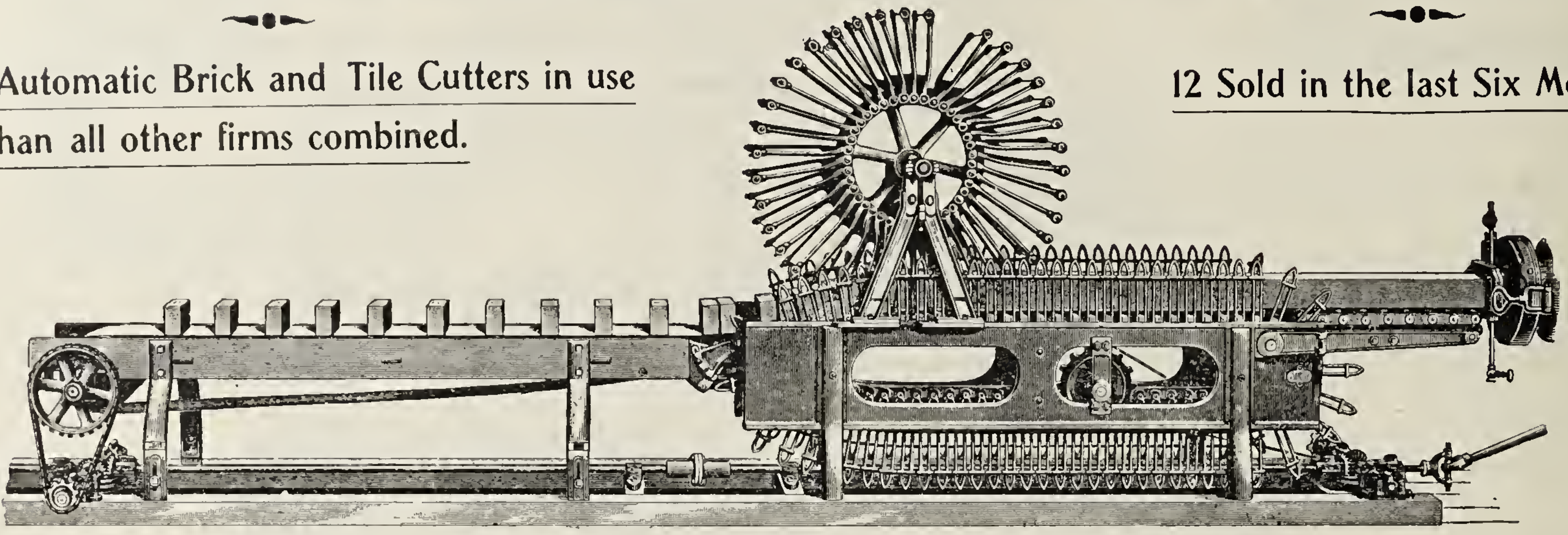
THE MACHINERY THAT NEVER DISAPPOINTS

The American Clay-Working Machinery Co.,
BUCYRUS, OHIO.

The Only ABSOLUTE DOWN CUT Cutting Table on the Market.

More Automatic Brick and Tile Cutters in use than all other firms combined.

12 Sold in the last Six Months.



BENSING'S AUTOMATIC SIDE CUT BRICK TABLE.

Correct in principle and mechanism.

Simplicity itself—nothing can get out of order unless broken by carelessness.

Strong and of long life—all its motions being continuously rotary.

The parts work together without jarring.

There is no halt or hesitation—every motion is prompt and positive.

Requires no expert to keep it running or in repair.

The column of clay, assisted by friction, runs the table, but all movements are regulated by clay column. When the column goes, table moves, and stops when it stops.

Breaks less than one-tenth the cutting wires that others do, and if wires are broken may be easily replaced without stopping.

The brick cut are square and true, with sharp edges and corners, and equal to the finest Press Brick.

The first brick is as good as the last, and the last as the first.

Cutting capacity practically unlimited.

READ WHAT USERS SAY:

J. D. FATE & CO., Plymouth, Ohio. Memphis, Mo., October 12, 1899.

Gentlemen:—We have been using your **Automatic Side Cut Brick Table** for two years, and are now ready to tell you what we think of it. It is beyond a doubt the superior of any other cutter now on the market for fine work, regularity in operation, self adjustment to any capacity, and last of all, **Durability.** In using other cutters, we were obliged to use either oil or water to prevent the bar of clay from sticking to parts of the table. With your Automatic table we use nothing of the kind. We simply throw the clay into the machine and the machine does the rest. The brick are all cut even and with perfect face and edges, and are delivered onto the off-bearing belt in first-class shape. Our table would cut 100,000 brick per day if we made them that rapidly, but adjusts itself to our 20,000 per day without any work on our part. Yours truly, MEMPHIS BRICK & TILE WORKS.

J. D. FATE & CO., Plymouth, Ohio. Salt Lake City, Utah, October 11, 1899.

Gentlemen:—Yours of the 3rd inst., at hand and contents noted. In regard to the **Automatic Side Cut Brick Table** purchased from you in June last, would say that we deem it **Perfection Itself.** We make from 35,000 to 60,000 brick per day, as our needs require. This by increasing or lessening the speed—the result from either speed is the same in quality. Our material is pulverized, screened and pugged, and works smooth and after the brick are cut they are delivered onto the off-bearing belt in a perfect condition, at either speed, all of one size, well defined edges and no delay from broken wires. We would not part with the system under any **Circumstances.** We cheerfully recommend it to all brickmakers. Yours truly, THE SALT LAKE PRESSED BRICK CO.

J. D. FATE & CO., Plymouth, Ohio. Des Moines, Iowa, May 11th, 1899.

Gentlemen:—We are so well pleased with the Automatic Side-cut Brick Machine that we purchased from you this Spring that we feel it our duty to send you a testimonial. We feel safe when we say it has no equal, but we are sure when we say it has no superior, because it is perfect when it comes to making a nice, square brick. We have tried it in all kinds of clay that we have here, and it makes no difference, it runs just the same. We can now make a fancy face brick, which we could not do before. We do not use power to drive the wheel—the column of clay runs it nicely. We feel that it is the best investment we ever made. If you have any prospective customer in our neighborhood, send him to our yard to see the machine, and we will venture to say he will buy your machine.

Very respectfully yours, NEWMAN BRICK & COAL CO.

"Soft Mud" Brick Machinery, both Steam and Horse Power in addition to our full line of "Stiff Mud" Machinery. Ask for Catalogue and Prices.

J. D. FATE & CO.,
Manufacturers of
BRICK AND TILE MACHINERY.
PLYMOUTH, OHIO.
Western Reprentative: B. E. LaDOW, 406 Chamber of Commerce Bldg., CHICAGO, ILL.

JULY 4,
1859.

FORTY

YEARS OF

SUCCESS!

H. BREWER & CO.,

TECUMSEH, MICH.

WIRE CUT and MOLD PRESS,

Brick Machines.

Best
Tile
Machines
IN
America.

Milledgeville, Ga., May 16, 1899.

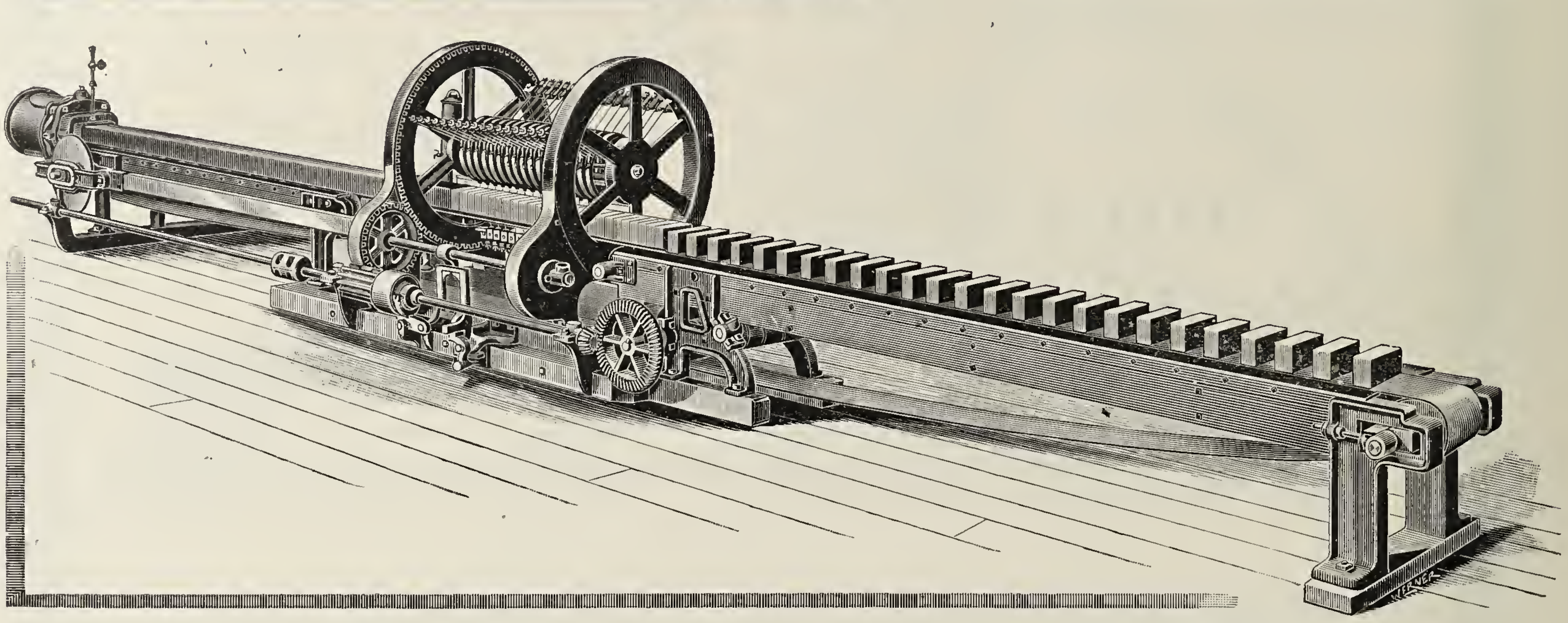
MESSRS. H. BREWER & CO.,

I was raised at the brick business, and my father before me. Have been to many brickyards in different parts of America and in the old country, and have never seen a brick machine that makes as nice and good brick from stiff clay as your No. 12 Mold Machine. I have worked wire cut machinery for 18 years, and made brick as good as were demanded, but your No. 12 Mold Machine for the clay I am now working makes finer brick than I ever made on a wire cut.

Very respectfully,
J. W. McMILLEN.

FINALLY

**Side Cut Brick
Automatically Cut
With SMOOTH EDGES.**



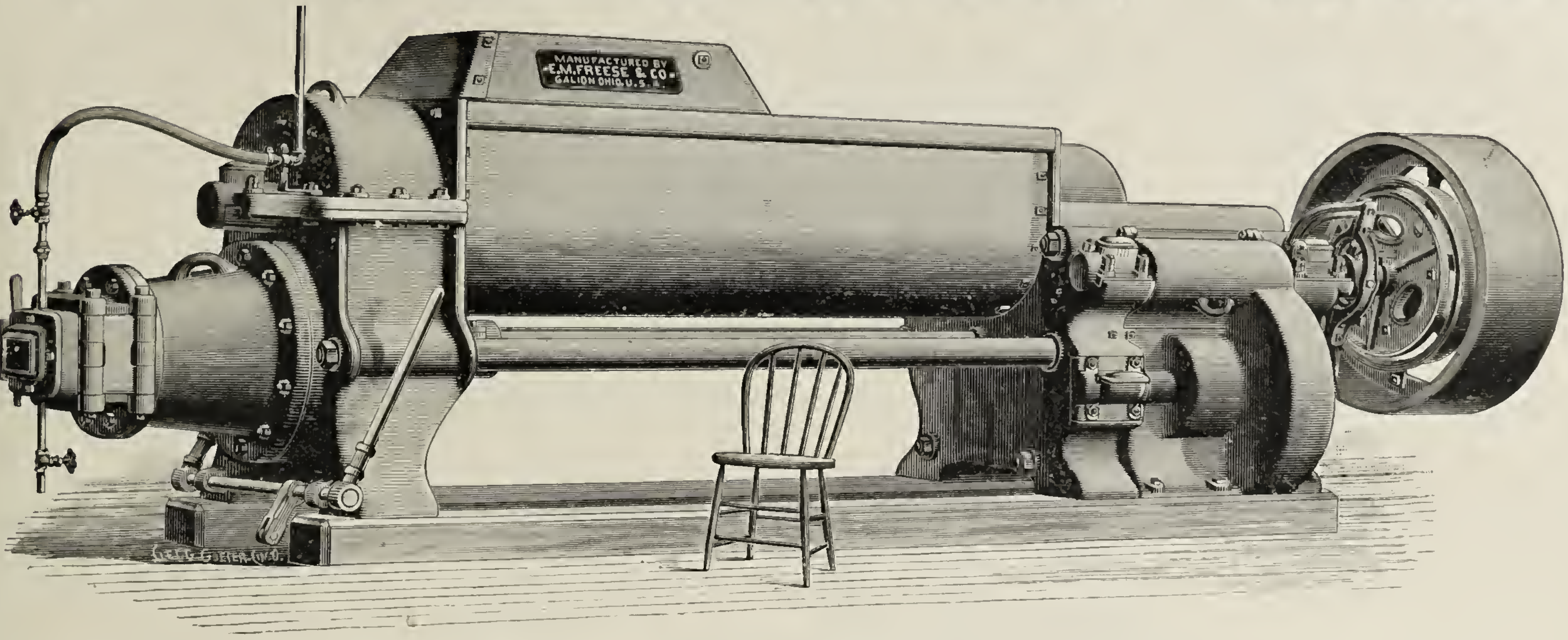
A New Rotating Cutter for Side Cut Brick.

POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

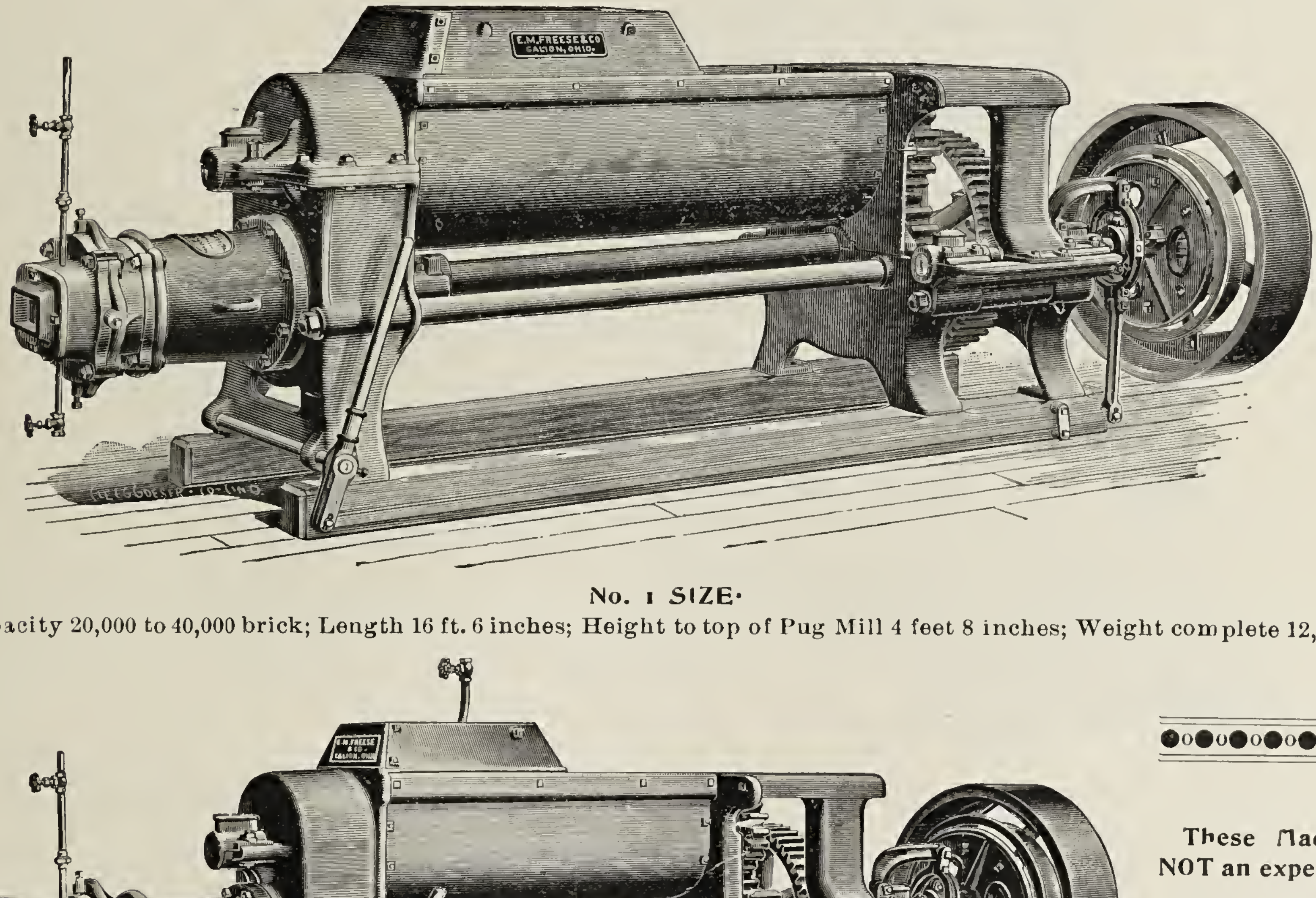
**E. M. FREESE & CO.,
Galion, Ohio.**

The Original Union Brick Machines



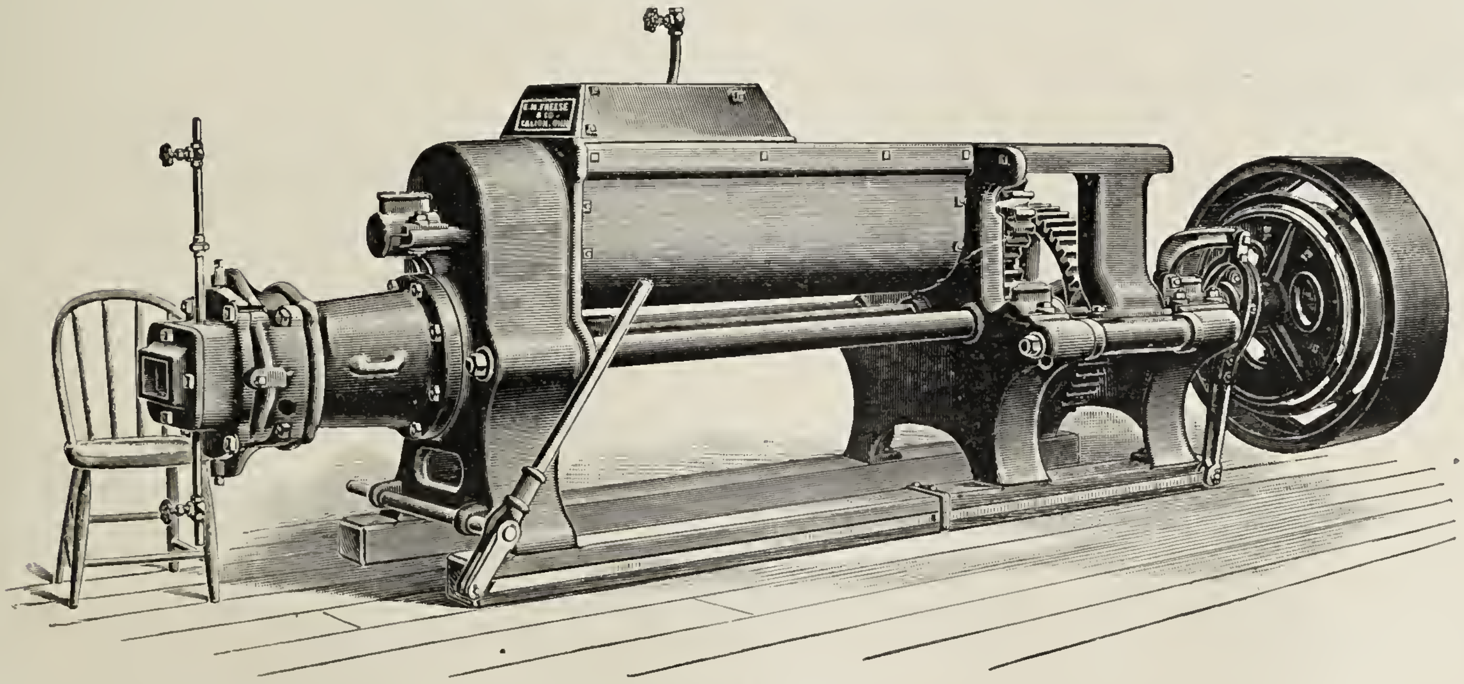
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



These Machines are NOT an experiment.

They are used in fifteen States.

They are a SUCCESS Investigate them.

No separate Pug Mill required.

No. 2 SIZE.

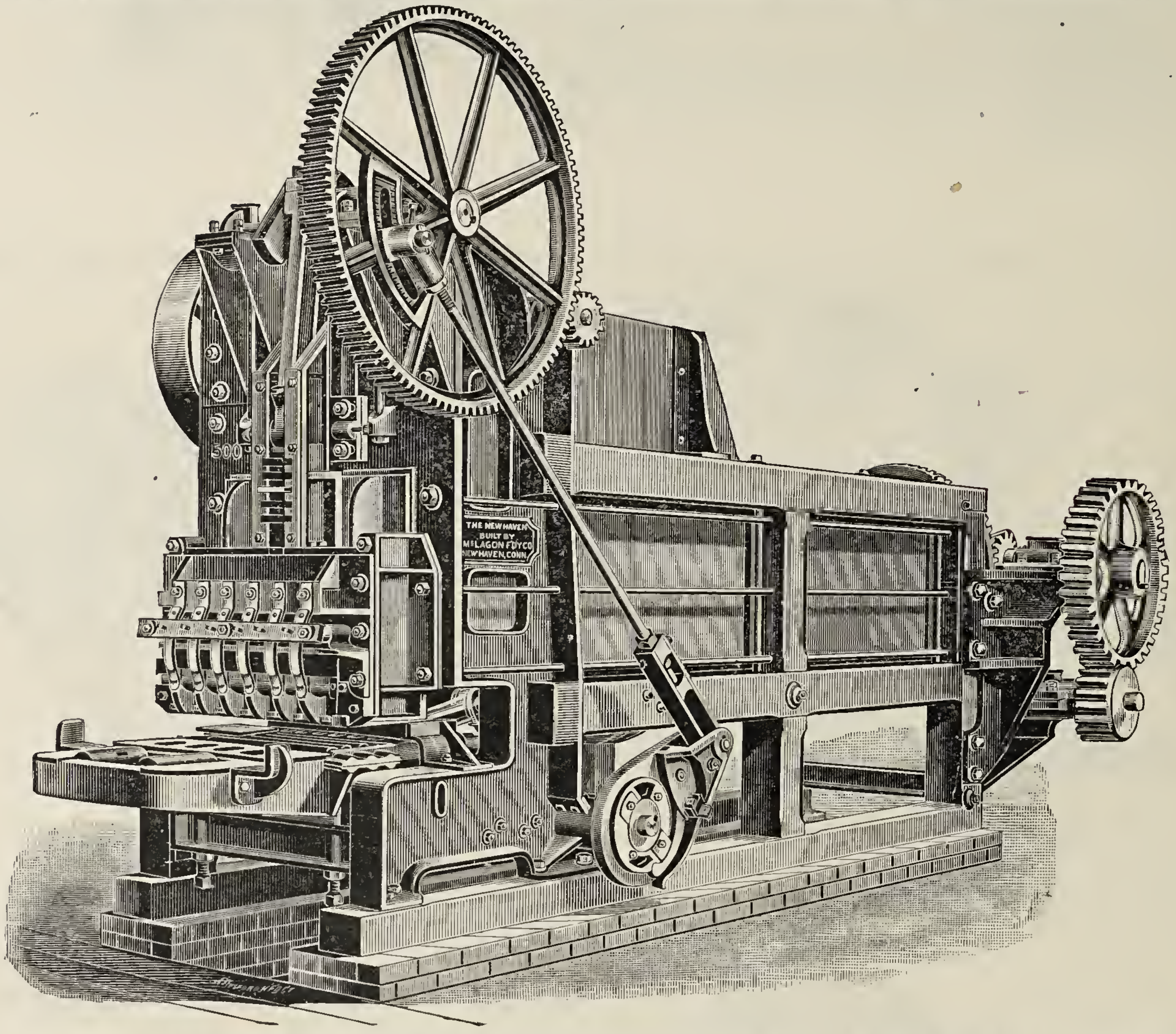
Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

E. M. FREESE & CO., Galion, Ohio.

THERE ARE NO ELEMENTS OF CHANCE ABOUT

"New Haven" Brick Machines.

EVERY ONE BUILT HAS BEEN A SUCCESS.



BECAUSE of this **Lack of the Elements of Chance in our "New Haven" Machinery** we have had **unusually good "luck"** in pleasing our patrons. All buyers of our machinery are our friends. Being ambitious to increase our circle of friends we are anxious to increase our sales. **This kind of Machinery is worth Investigating.**

The Eastern Machinery Co.,

NEW HAVEN, CONN.

DO YOU WANT THE

BEST BRICK DRYER?

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel. It is a fuel saver and hence a money maker.

If you want the best and most economical brick dryer don't fail to get our prices. If you want a cheap dryer, its no use to write us for we don't build that kind.

◆

Read what H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE: 60TH AND HAVERFORD STS. TELEPHONE 147, W. P.

H. C. CARROLL & SONS,

Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS:
57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

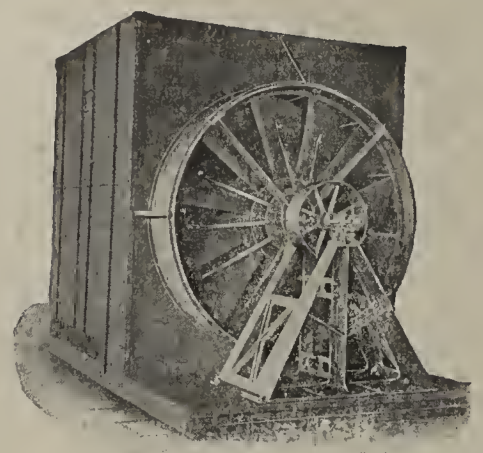
◆

The Cummer Clay Dryer is now in successful operation at many places in the United States. Like our brick dryer it is fully guaranteed to perform its work in the most effective manner possible and in any desired capacity. The **Cummer Dryer** succeeds where others fail. It will afford us pleasure to demonstrate its superiority over all other dryers.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell you troubles to"

The F. D. CUMMER & SON CO.,

CLEVELAND, OHIO.



Do You Want to Increase Your Profits?

You'll find upon investigation that a positive means to that end is an

"A. B. C." BRICK DRYER.

MANUFACTURED ONLY BY

American Blower Company.
DETROIT, MICH.

The Turner, Vaughn & Taylor Co.,

CUYAHOGA FALLS,
OHIO, U. S. A.

MANUFACTURERS OF
ALL KINDS OF

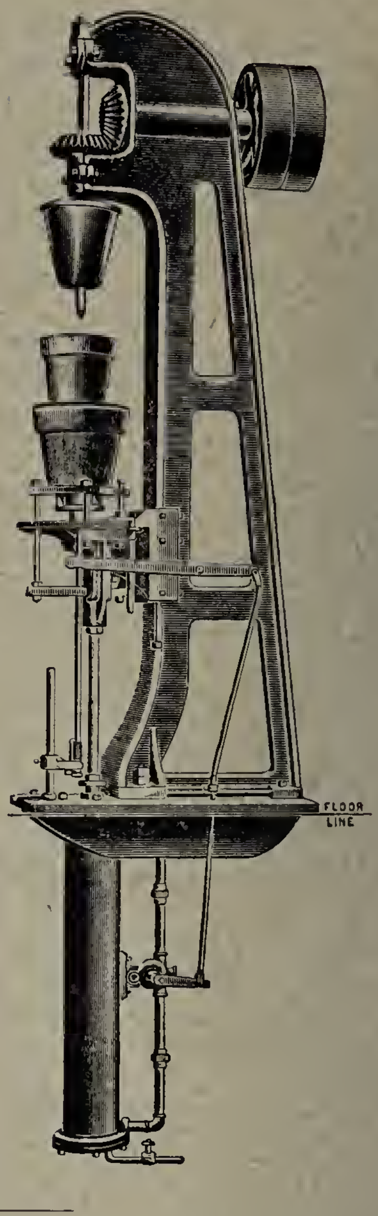
Claywording Machinery.

The accompanying cut shows our improved machine for making

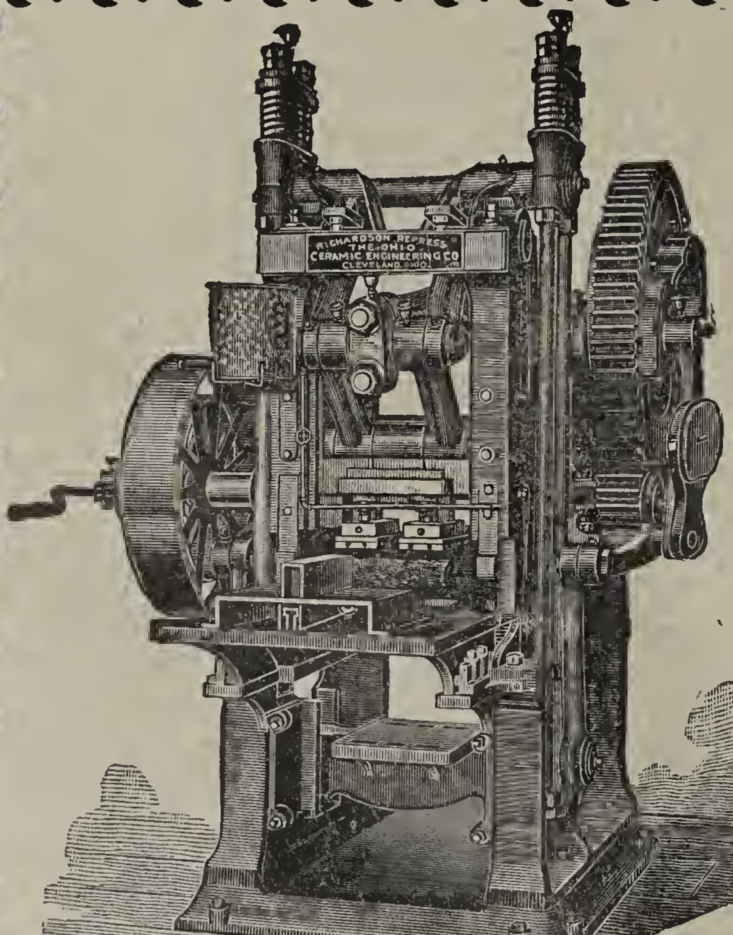
Bessemer Converter Nozzles, Sleeves, Runner Brick, Bowls and FLOWER POTS of ALL SIZES.

We also make the BEST

SEWER PIPE PRESSES,
GRINDING PANS (Wet and Dry.)
PUG MILLS, Etc., Etc.



DONT FAIL to get OUR PRICES if You Want the BEST MACHINERY.



THE RICHARDSON REPRESS.

Cut Down the Cost of Production

And at the same time do Satisfactory work.
That's what our machines will do.
Send for Catalogue.

The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

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THE CLAY WORKER

A JOURNAL DEVOTED TO ALL CLAY WORKING INTERESTS.
INCLUDING BRICK TILE TERRA-COTTA SEWER PIPE POTTERY ETC.

T. A. RANDALL & CO., PUBLISHERS.

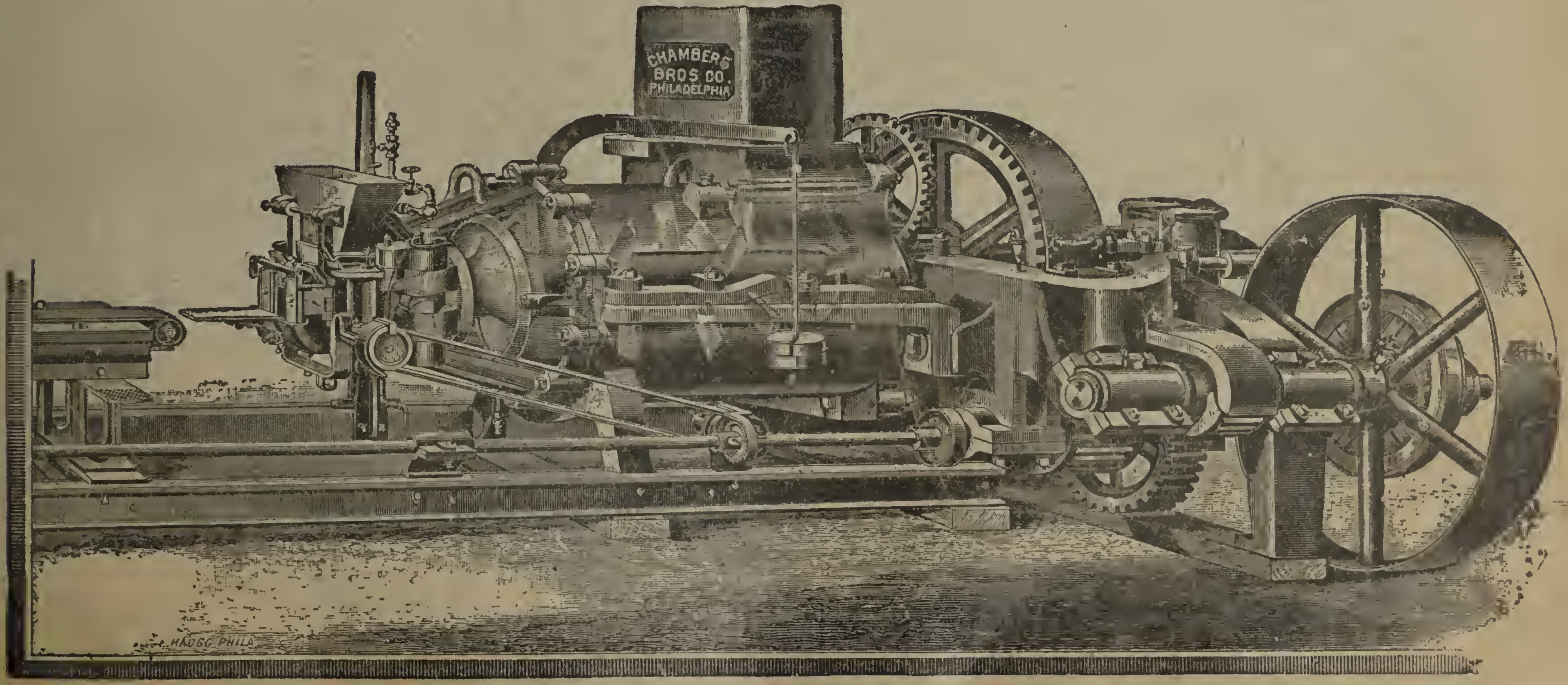
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXXII, No. 6. INDIANAPOLIS, IND., DECEMBER, 1899. $2.00 a Year in Advance.

Automatic Side-Cut and End-Cut Brick Machines.

Machinery for Hollow Brick.

We aim to Build only the Best in its Class.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

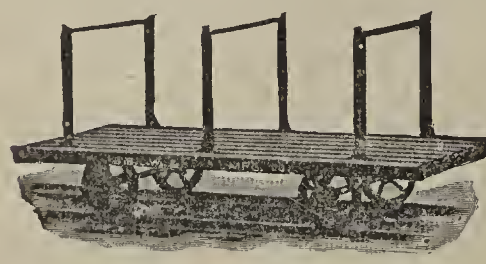
The Atlas Bolt & Screw Co.,

Cleveland, Ohio.

Our cars are made of Steel and Malleable Iron, have drawn steel rolls in our Dryer car bearings. Guaranteed in every respect. Dryer cars for Brick, Terra Cotta, Hollow Block, Fire Proofing, Cement, and all material that cars are used for.

We are the Largest Manufacturers of Dryer Cars in the World.

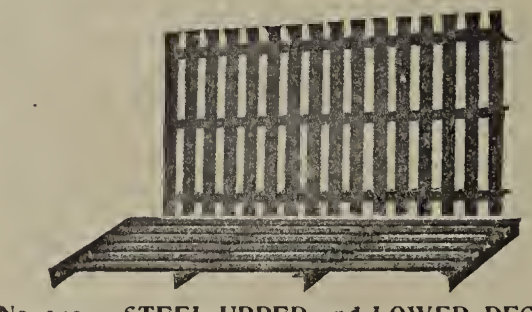
Our Steel Cars are the Strongest, Lightest and Easiest Running Cars on the Market; all parts interchangeable; made especially for export trade. Why buy Pot Metal Cars when you can get a Steel Car just as cheap, that will last forever? We have Dryer Cars for all purposes.



No. 126. DOUBLE DECK—STEEL DECK.

This is an especially strong and substantial double deck car for the same uses as No. 124, but with lower deck of channel steel same as No. 108 single deck. The best car made for unusually large and heavy loads. Bricks will creep better on this car than on a wooden deck.

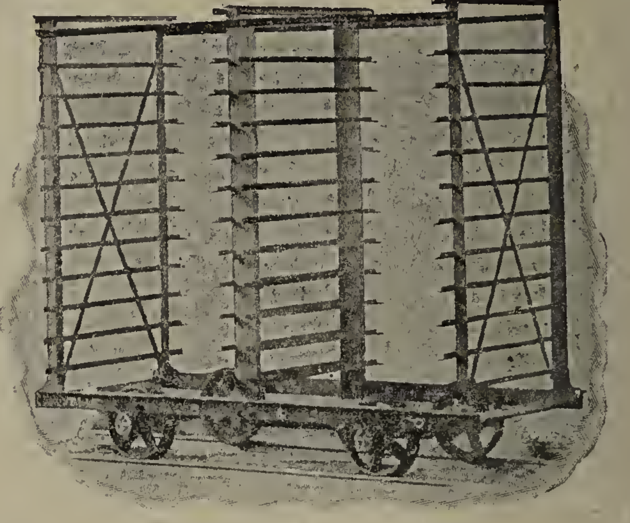
Length, out-to-out, 6 feet 11 inches; width, out-to-out, 35 inches; weight, 400 pounds; height, top of lower deck to top of support for upper deck, 21 inches; guage in-to-in of rails, 24 inches; capacity 500 to 600 green brick; height, top of rail to top of lower deck, 13 inches.



No. 149. STEEL UPPER and LOWER DECKS.

These decks are made with channel steel slats and angle steel cleats well riveted together and forming the strongest and best style of decks. Brick will creep better on these decks than on wooden ones. Made to fit the Nos. 124 and 126 double deck cars.

Length of lower deck from out-to-out, 6 feet 11 inches; it has 6 slats 2½ inches wide, spaced 2⅛ inches; weight, 130 pounds; length of upper deck out-to-out, 6 feet; it has 16 slats 2½ inches wide, spaced 2⅛ inches; weight, 180 pounds.



No. 133. SOFT MUD RACK.

For soft mud brick on flat pallets, brick on flat, 6 brick per pallet, 3 pallets wide, 12 pallets high, 4½ inches top to top of pallets. Standard side of car for 34 inch pallets, but can be made for any other length desired. The only rack car made which is absolutely rigid and which will carry the load without racking.

Length, out-to-out 6 feet 9 inches; width, out-to-out, 36 inches; weight, 495 pounds; gauge in-to-in of rails, 24 inches; capacity, 432 green brick; height, top of rail to top of upper pallet slides, 5 feet ? inches.

Write for Our Catalogue and Prices.

The ATLAS BOLT AND SCREW CO., Cleveland, Ohio.

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WHEN WRITING TO ADVERTISERS

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For Cleaning and grading

CLAY, SHALE, SAND, CEMENT, COAL, STONE, Etc.

For
Chute or Cravity
Screens.

For
Shaking or
Vibrating Screens.

For
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Screens.

For
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Screens.

For

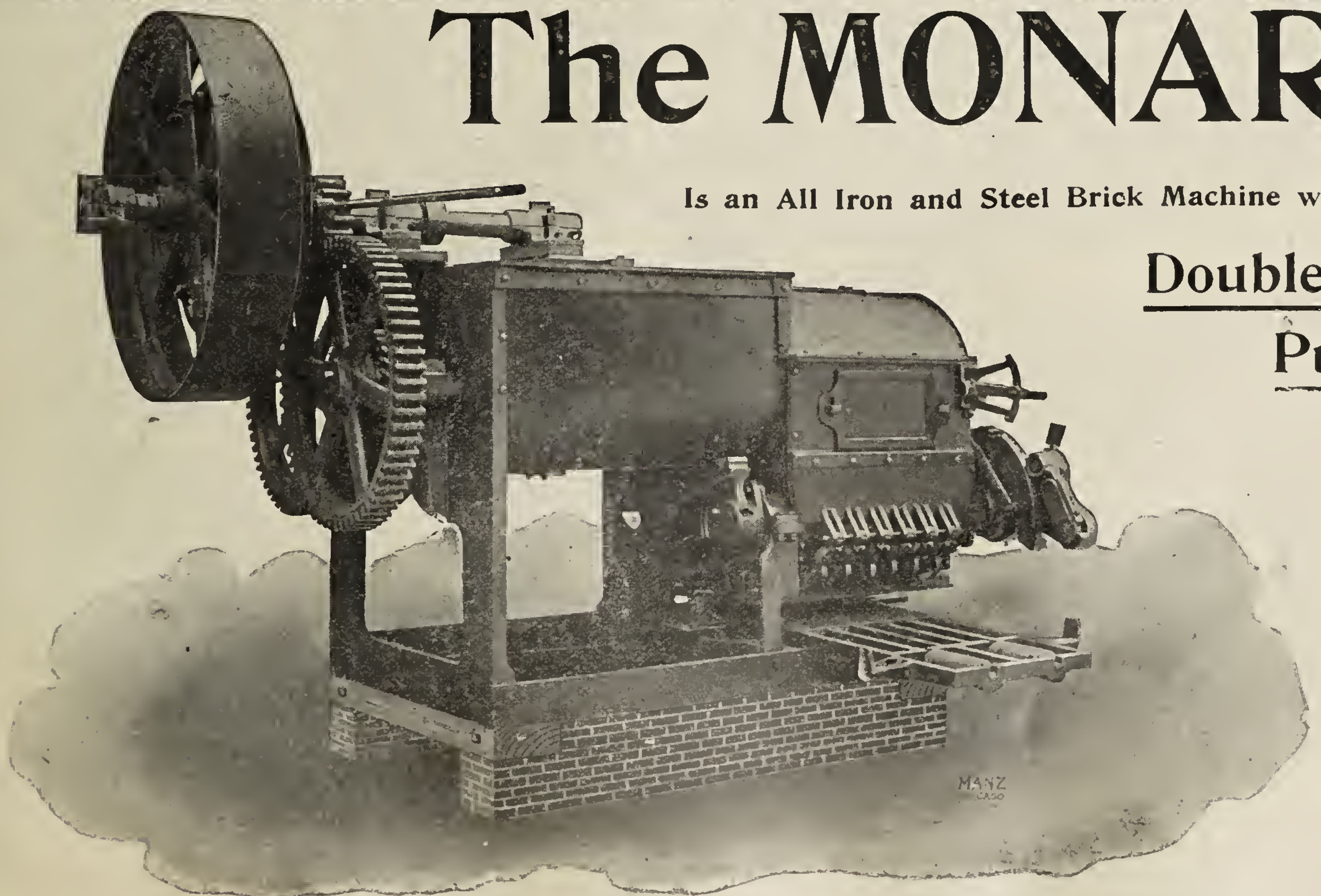
PALLETS or TRAYS, CAR BOTTOMS, DRYING FLOORS, CONVEYOR BOTTOMS, SEPARATORS, Etc.

PERFORATED STEEL FOR CLAY SCREENS.

Samples or blue prints with prices furnished on request.

THE HARRINGTON & KING PERFORATING CO., No. 231 North Union Street,
CHICAGO, ILL., U. S. A.

The MONARCH



Is an All Iron and Steel Brick Machine with

Double Pug Mill.

• • •

SIMPLE IN CONSTRUCTION, DURABLE AND . . . POWERFUL.

• • •

Every working part stands open to view both front and rear. It is a World Beater when it comes to quantity and quality of brick. We carry in stock a full line of first-class Brickyard supplies at a very reasonable price. Also the new **IRON QUAKER.** Engines and boilers. Send for 1899 Catalogue.

JAMES W. HENSLEY, Successor to S. K. FLETCHER, **Indianapolis, Ind.**

W. L. KIDNEY, Sales Agent, Capetown, South Africa.

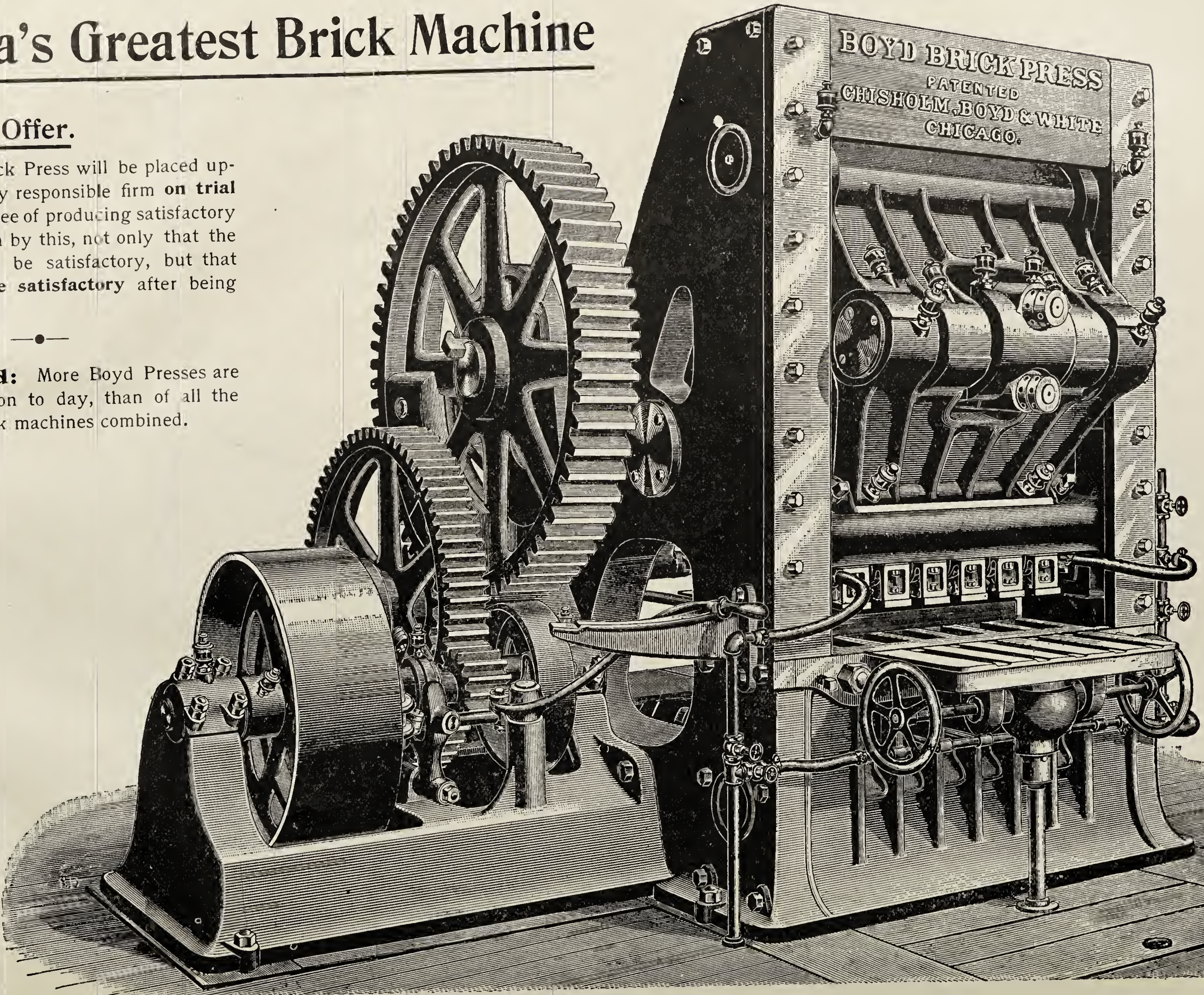
America's Greatest Brick Machine

A Straight Offer.

The Boyd Brick Press will be placed upon the yard of any responsible firm **on trial** and under guarantee of producing satisfactory results. We mean by this, not only that the Press itself shall be satisfactory, but that the **brick shall be satisfactory** after being burned.

—●—

Its Record: More Boyd Presses are in actual operation to day, than of all the other pressed brick machines combined.



OFFICE AND WORKS,
57th and Wallace Streets.

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The Powerful Pressing Mechanism of the Boyd Press Lasts Forever.

Great for Strength.

The engraving shows the heavy forged steel Side-Bars, the Toggles, the upper and lower Crossheads, with the plungers in position. These comprise the "pressing mechanism" of the Boyd Brick Press, and take all the strain exerted in pressing the bricks in the molds between the plungers. They can never wear out and cannot be broken. These pressing parts are suspended upon the lifting levers, and the side frames of the press only guide the side-bars in their upward and downward movements.

Great for Beauty.

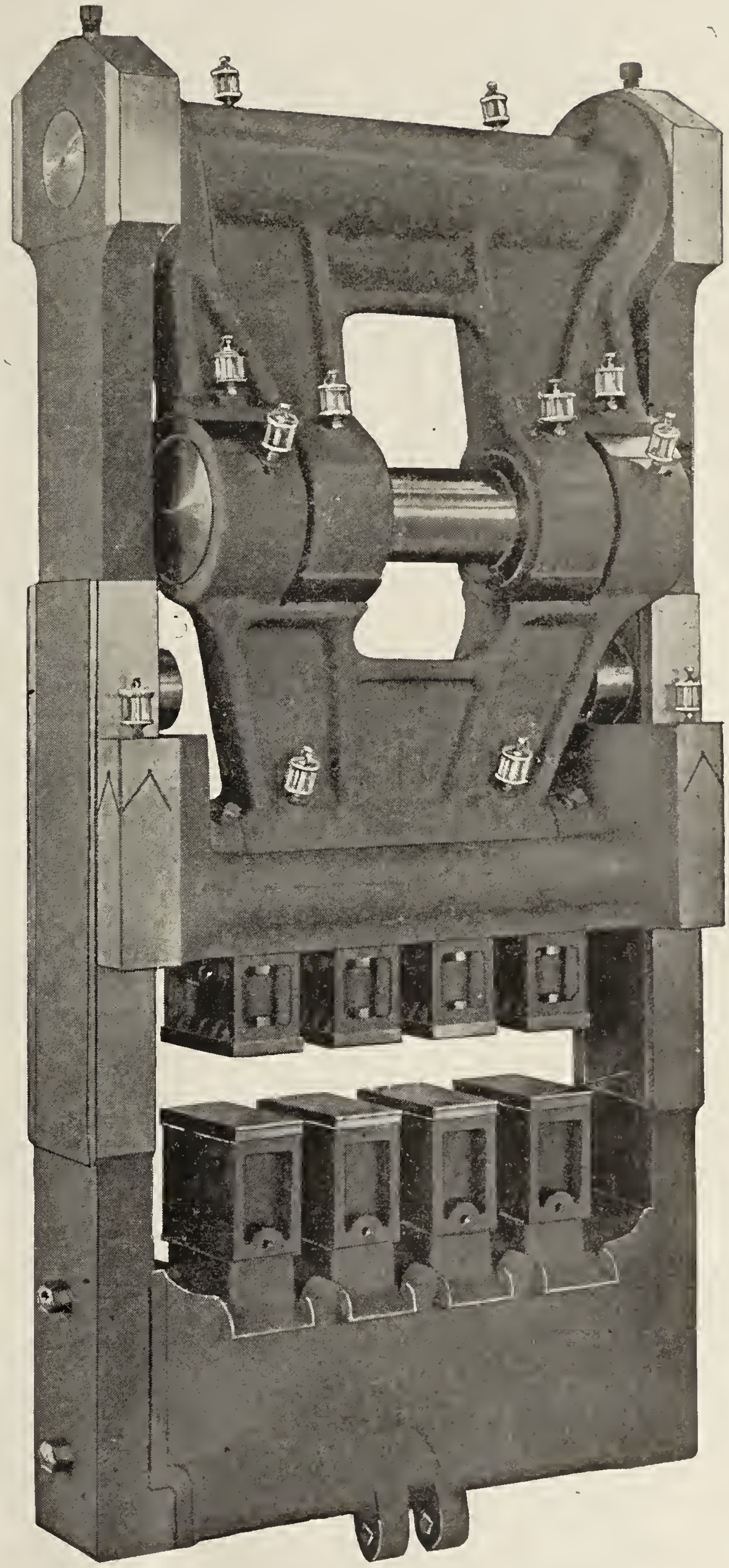
The symmetrical design of the Boyd Brick Press gives it the strength and beauty for which it has always been distinguished. The housing or stand, which contains the driving pulley and intermediate gears, is bolted to the main frame as shown. Each press rests on the floor line, is self-contained and does not need to be bolted or fastened to its foundation.

Noiseless.

No strain is exerted upon the side frames of the press. The movement of the Boyd Press is noiseless and without jar or shock. No buffers, air cushions, hooks, latches, or other uncertain mechanism are required or employed. There is nothing to get out of order. The mold liners are the same for and will fit each size press. They can be taken out and replaced, or ornomental molds set in without removing any of the working parts of the press.

No Pitman=Lever.

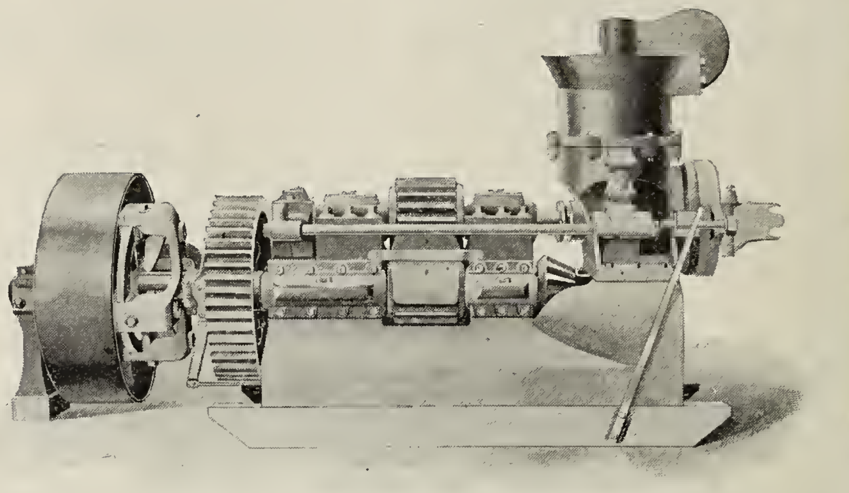
The Modern Boyd Press has no **Pitman-Lever**, though we have the only valid Patents on Pitman-Lever Presses. Eight and ten years ago we built Pitman-Lever Presses, but none since 1891, when it was superseded by the Improved Boyd. Nobody now wants a Pitman-Lever Brick Press, can't afford to use one. We will tell you why if you want to know. So could some of our first customers.



CHISHOLM, BOYD & WHITE COMPANY,

OFFICE AND WORKS: 57th and Wallace Streets. CHICAGO, U. S. A.

END AND SIDE CUT AUTOMATIC BRICK CUTTER.



WONDER BRICK MACHINE, made in four Sizes Ranging in Capacity from 25,000 to 100,000 Brick per day of 10 Hours.

Wonder Brick Machinery

IT IS CONCEDED that the best brick paved streets are in Terre Haute, Ind. We invite you to call on the Terre Haute Brick and Pipe Co., and see the **Big Wonder** make the brick. . . .

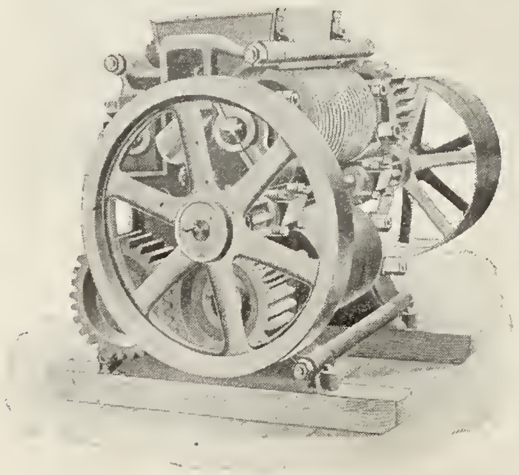
The Wallace Mfg. Co.,

Frankfort,
Indiana.

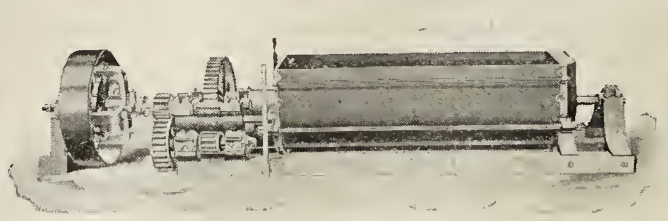
WESTERN AGENTS:
Chicago Brick Machinery Co.,
CHICAGO, ILL.

* * *

SEND
FOR
CATALOGUE.



CRUSHERS AND STONE SEPARATORS, made to Suit Conditions under which they are to work.



OPEN AND CLOSED TOP PUG MILLS. Capacity to suit your Requirements.

A RECORD BREAKER.

THE **Battle Ship Oregon** was not built by the oldest and largest Ship Building Works in the World, but she was a record breaker for low cost for repairs. So with the **Wonder Brick Machines** as the following letter testifies. This is the second Season this machine has been run.

GRAND RAPIDS, MICH., July 22, 1899.

THE WALLACE MFG. CO.,
Frankfort, Ind.

Gentlemen:—Will you please send us by freight the two knives that fit on the horizontal shaft, Big Wonder, as the old ones are badly worn. Also send us your catalogue price list.

We are making 50,000 brick per day regularly on the Big Wonder. Have not started up any of our other machines this season, as the one machine fills our yard completely, which holds as you know 500,000 brick, requiring two gangs of wheelers and setters. We have never broken so much as a bolt, closed down the machine a minute for readjustment, or paid out one dollar for repairs since starting. We wish you abundant success.

Very respectfully yours,
GRAND RAPIDS CONSOLIDATED BRICK & TILING CO.

You will find seven **Wonder Brick Machines** in Grand Rapids and vicinity.

The Wallace Mfg. Co.,

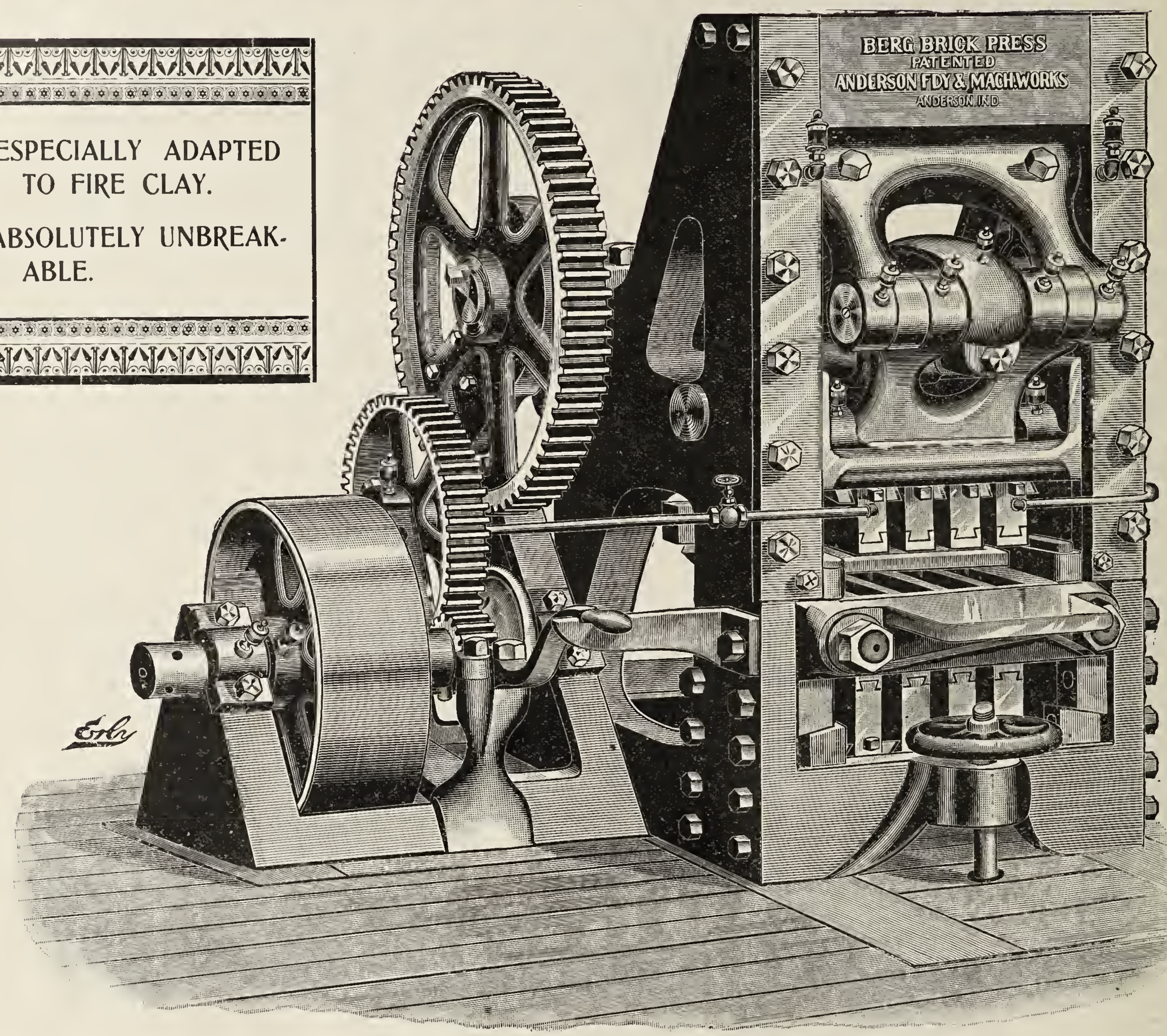
CHICAGO AGENTS:
CHICAGO BRICK
MACHINERY COMPANY,
Chicago, Ill.

Frankfort,
Indiana.

The BERG BRICK PRESS.

ESPECIALLY ADAPTED TO FIRE CLAY.

ABSOLUTELY UNBREAKABLE.



The Highest Development of the Art of Brickmaking—so Pronounced by the U. S. Government.

Three distinct pressures.
Greater Pressure than any other machine.
Greater Strength than any other machine.
Will put more clay into given space than any other machine
Less working parts than any other machine.
No Plunger Stems, eye rods or Springs.

Mold Liners Made of Tempered Tool Steel.

Makes all size Brick and Tile from 2 to 24-inch.

SOLD BY

Chicago Brick Machinery Co.,
225 Dearborn St., CHICAGO.

MANUFACTURED BY

The Anderson Foundry & Machine Works,
Anderson, Indiana.

The Latest Improved

ROSS-KELLER TRIPLE PRESSURE BRICK MACHINE

.... Manufactured in 4 and 6 Mold Sizes.

Weight of four mold machine, 58,000 pounds; Capacity, 24,000 brick per day.
Weight of six mold machine, 75,000 pounds; Capacity, 35,000 to 40,000 brick per day of 10 hrs.

Brick Set in Kiln DIRECT from Machine.

* * * *

"The Proof of the Pudding is in the Eating."

THE ROSS-KELLER BRICK MACHINE is not "pronounced by the United States Government the highest development of the **Art**" of brick making machinery. But the United States Government **DID** on the 24th day of October, 1898, "pronounce" to the world that the ROSS-KELLER MACHINE was the best "development" to be used by it for the manufacture of forty million pressed brick to be used in the construction of the new United States Penitentiary at Ft. Leavenworth, Kan., as was evidenced on that day, when bids from all of the makers of pressed brick machinery were opened, and after a thorough examination of the different machines in practical operation, **DID** purchase at the highest bona fida bid, the ROSS-KELLER MACHINE. For particulars regarding the working of this machine during the first year, we respectfully refer to the Hon. R. W. McClaughry, Warden U. S. Penitentiary, Ft. Leavenworth, Kansas.

* * * *

Two of our six mold machines are used by the Green & Hunter Brick Co., Thurber, Texas, the finest plant in the United States—If our machine is good enough for Uncle Sam and such plants as the Green & Hunter Co., why is it not good enough for you?

* * * *

For Price and Full Particulars, Address

Ross-Keller Brick Machine Co.,
No. 915 and 916 Holland Building,
ST. LOUIS, MO., U. S. A.

The Standard Drier

FOR BRICK AND TILE.

The STANDARD DRIER purchased from you some time ago is giving entire satisfaction. With it, we consider our plant perfect. Without it, we would be compelled to shut down at this time of the year; but as it is, we are making brick the same as during the finest Summer days. We find that with your Drier the expense of running has been reduced and the repairs are not worth mentioning.

We consider the "STANDARD" DRIER a great success.

GROMAN BROS.

South Bethlehem, Pa., Oct. 7, 1899.

EVIDENCE OF SUPERIORITY.

Hundreds of Testimonials. Ask for them.

ADDITIONAL PROOF.

What others say is What Counts. Ask for Catalog. It tells all about THE STANDARD DRIER

We are drying from 20 to 23,000 brick per day in our three track "STANDARD" DRIER; using exhaust steam in the daytime and live at night. We find that drying by your system has removed the saltpetre or whitewash from our brick entirely.

We take pleasure in recommending the "STANDARD" to anyone who desires a first-class Drier.

THE COLUMBIA BRICK CO.

Columbia. Pa , July 24, 1999.

The Standard Dry Kiln Co.,

186 South Meridian Street. ***INDIANAPOLIS, IND.***

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

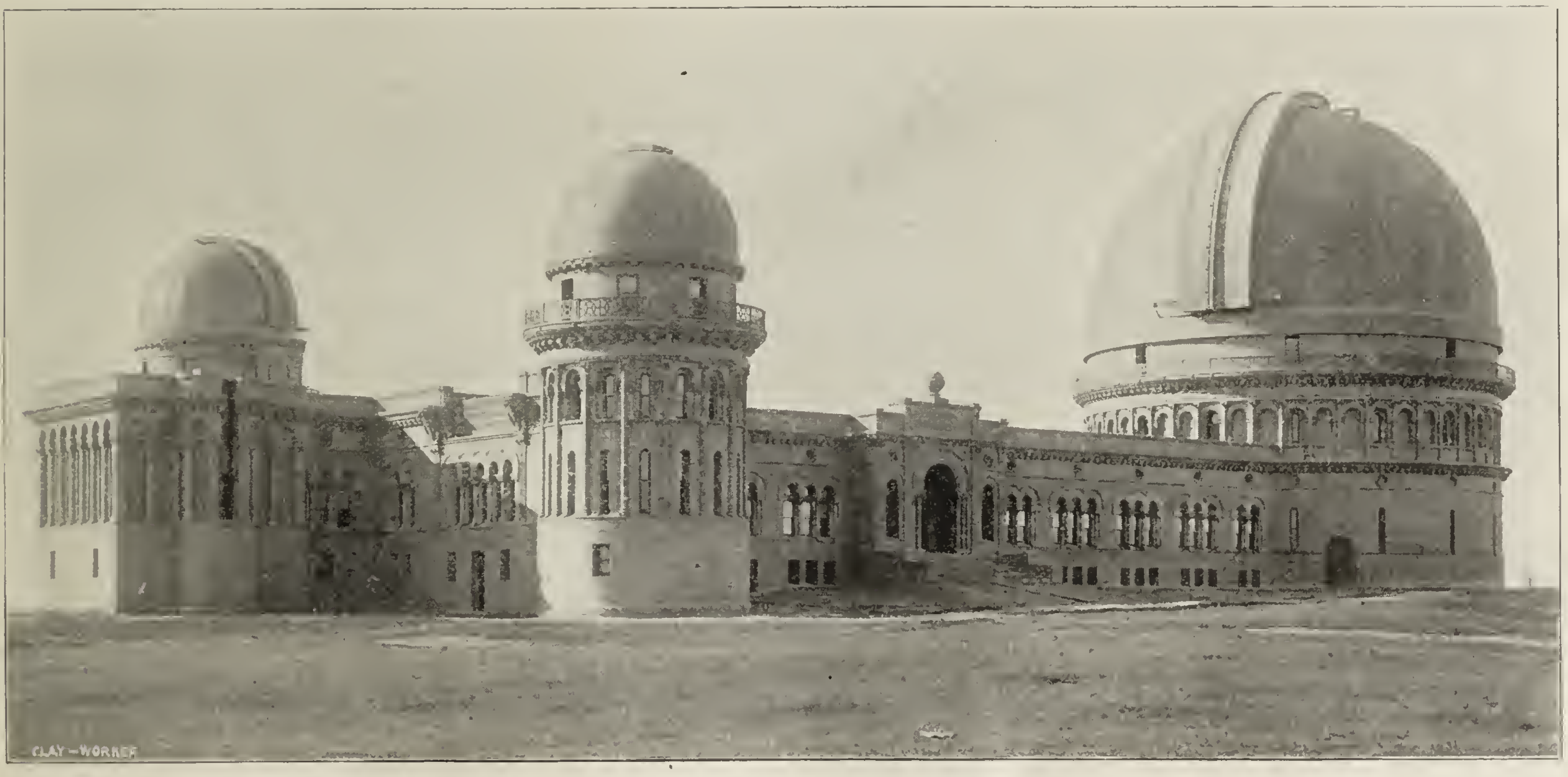
VOL. XXXII. INDIANAPOLIS, IND., DECEMBER, 1899. No. 6

Written for THE CLAY-WORKER.

BRICK AND TERRA COTTA.

Pressed Brick as Souvenirs—A Novel Method of Increasing the Demand for Front Brick.

THE GIFT of the largest telescope in the world, by Mr. Charles T. Yerkes, to the University of Chicago, necessitated its proper housing and equipment. After extensive examinations a location on the high ground overlooking Lake Geneva, Wisconsin, was chosen. Here were found more of the requirements than in any other locality examined. Healthful surroundings, pure air undefiled by smoke, and stable in condition, as well as quiet and freedom from outside affairs, were all necessities for its proper location. Clearly he who was to discover new comets or map out new details of the moon or Jupiter, or trace the path of some remote star needed to be away from the busy whirl of the city.



Yerkes Observatory, Lake Geneva, Wis. Photographed by Henry E. Torgersen & Co., Chicago.

Then, too, if the moon and planets were to be brought down to close range our surroundings must be fitting and appropriate, lest when we have brought them so close they catch us napping and get wrong impressions of us, structurally and artistically.

All this made opportunity for the architect. An opportunity which Mr. Henry Ives Cobb improved. He who had given a Fisheries building to the Columbian Exposition rose to the occasion of a great astronomical building. A glance at the ground plan sketched herewith will show it full of possibilities, and another glance directed to the perspective will show how well these possibilities were realized. This perspective shows the building with the small domes in the foreground, and is particularly interesting in that regard, as, taken from the other side, the great dome is so massive that it covers everything else. Occupying a level plateau, high above the waters of this noted resort, overlooking miles of pleasant wooded shore and green hills and valleys, it raises its cool gray walls as a substantial monument to its builders and designers, showing absolutely that the hurrying American can stop in his feverish course and devote time and money to broadening human knowledge and to placing the proper apparatus for this in fitting settings.

The "Meridian Circle," the square building shown in the foreground, and at the end furthest removed from the big dome, is peculiar in that the building is cut completely in two in the middle, so that the instruments can swing completely over, thus leaving a slot extending from the floor up and across the entire building, and with no connection across it from one side to the other.

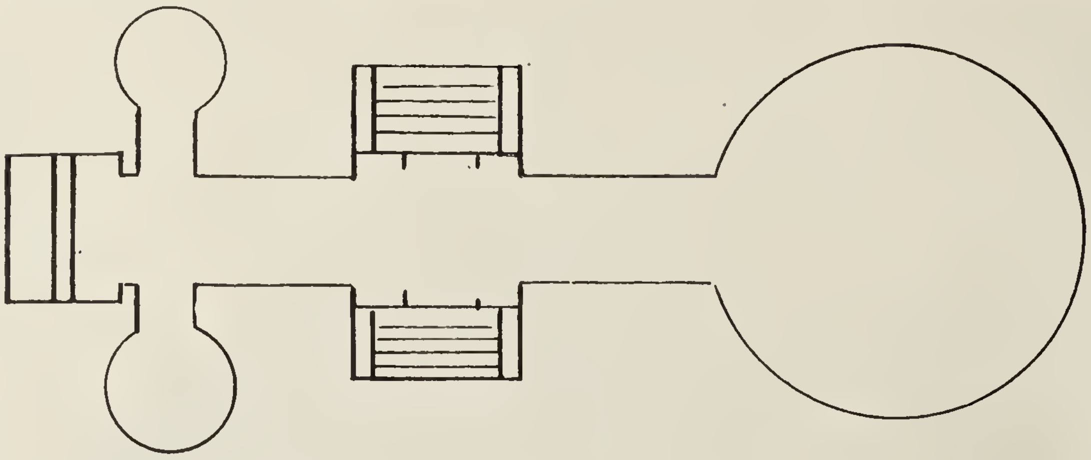
The brick used in constructing the walls of this building came from the works of our genial friend, Kilbourne, of the Columbus Brick and Terra Cotta Co. These were laid up in alternating courses, as shown in the sketch, one flat and the next on edge, all in Roman size, making alternate narrow and wide bands, and forming a most pleasant exception to ordinary methods, and also giving most excellent bond. The carrying out of this scheme was the more difficult in this particular building from the fact that each of the three dome buildings had a different radius, thus necessitating making a special brick for each dome, both with radius on the edge and also on the side. The making of the thin Roman brick with a radius side was a problem to tax the ingenuity of even Ohio manufacturers, but they put on their thinking caps and went at it. Expecting a large loss they made them abundantly, and then they all came out good, and they shipped what were ordered and gazed regretfully at the big pile of "overs" unfit for use on any other job. Fate sometimes comes to the rescue. It so happened in this instance. The building was delayed through the winter, with the walls only partly completed. During all the long months that the building was incomplete the farmers for miles around brought their families and visiting friends to see this wonderful building, and on their departure took with them a liberal supply of souvenir bricks, and, as fate directed, they seemed to favor the piles of these special radius brick, so that when pleasant weather came and the farmers were busy again on their farms, and the workmen were busy on the walls of this structure, Kilbourne got a rush order for the rest of his radius brick.

This consumption of brick as souvenirs is something that ought to be encouraged, it seems.

A glance at the detail of the entrance will show that the terra cotta man had something to think of. As in the Fisheries building, the architect chose his theme of decoration from the denizens of the deep, so in this building the ornament had largely to do with astronomy, keeping in close touch with suns, moons and stars, and continually reverting to the signs of the Zodiac. One can spend much time prying into remote corners and still find new and interesting themes, and the astronomers must be busy indeed to strain in through the big glass more interesting objects than show outside.

Certainly if comets and things cannot be inveigled into a building decorated and planned as this one is they cannot be caught at all. They have the instruments, they have the building, and they have the men to use them.

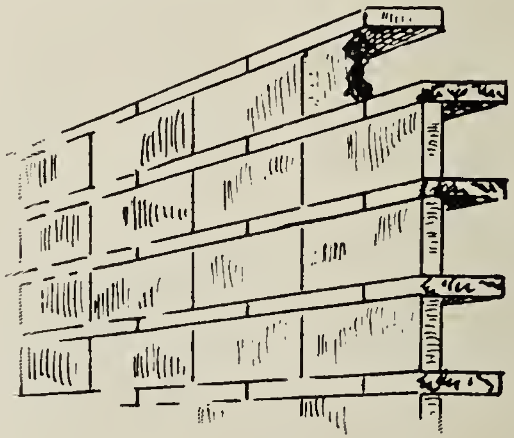
GATES.



Ground Plan of the Yerkes Observatory.

THE STRENGTH OF A BRICK.

It is so seldom in modern practice that masonry of any sort is loaded anywhere near to its limit that we are apt to forget how large a factor of safety has come to be considered wise, and how little real reliance is placed upon the innate strength of the units which go to make up the masonry walls. There have been a few cases on record where brickwork has been actually crushed by a load unwisely placed upon it in a building, but, generally speaking, the kind of brick that is considered advisable for use has practically a resistance to crushing so great that the determining factor in the designing of a wall or pier is not the strength of the unit, but rather the lateral stability of the completed structure. Indeed, measured by any tests which we can apply, the most ordinary sort of light hard brick has sufficient strength to satisfy the mere letter of even the most exacting building law. This was brought to our notice very clearly a short time since by some tests which were made by Norcross Brothers, the well-known builders, in connection with the construction of one of the large buildings in this city. A selection was made of a number of different qualities of brick, ranging from what would be termed a rather indifferent light hard up to a thoroughly hard burned dark brick, equal to the best quality which is manufactured. The tests were upon a half brick only, the loaded area averaging about fifteen square inches. A record was kept of the load which produced the first crack in the material, as well as the ultimate crushing strength per square inch. The former ran from 2,720 pounds per square inch for the poorest of the bricks up to 8,000 pounds per square inch for the best quality, while the ultimate strength ran from 3,149 pounds per square inch for the poorest sample up to 10,532 per square inch for the hardest. Or, reduced to tons per square foot, this means that the poorest sort of brick cracked under the equivalent of a load of nearly 196 tons per square foot, with an ultimate strength of 226 tons per foot, while the best sample cracked under 576 tons a foot, and only yielded under an ultimate strain of a little over 758 tons per foot. When we consider that the utmost that the building laws of most of our large cities consider as safe is a strain of fifteen tons per square foot on masonry walls laid up in cement mortar, this unit strain, as compared with the ultimate resistance of the poorest of these bricks of 220 tons per foot, allows for a factor of safety of nearly fifteen, while in the case of the hardest bricks the factor is over fifty.



Method of Laying Brick on Edge.

Now, we would not argue from this that it is perfectly safe to use light hard bricks, or that the wise builder can save the difference in cost between a good and an indifferent brick and secure just as good a building. As we stated in the beginning of the preceding paragraph, the strength of a wall is not wholly measured by the resistance of the units of which it is composed, but rather by the stability of the whole. Our modern methods of scientific analysis have enabled us sometimes to shade construction within some pretty perilously close scientific limits, and we cannot afford to take the chances of poor workmanship or unexpected concentrated loads and trust to anything but the best bricks for a first-class building. Still it is a satisfaction to the architect or constructor who is at the mercy of a careless or indifferent workman to know that if a brick pier is built up reasonably well, the material itself is innately so strong that there is very little risk of failure.

In this connection we recall the case of a large building erected some distance from Boston in which, by an oversight, the piers supporting an enormously heavy tower were built of a size which seemed so small as to arouse the fears of a constructor, who, to set his mind at rest, made some practical experiments on piers of the full size of the ones in the building, constructed in the same manner, which he loaded to destruction, after having allowed ample time for a good hard set on the mortar. We have not the figures at hand which give the crushing strength of the pier, but, as a result of these experiments, the builder felt there was not the slightest risk in loading good brick piers to twenty-five tons per square foot.—*The Brick Builder.*

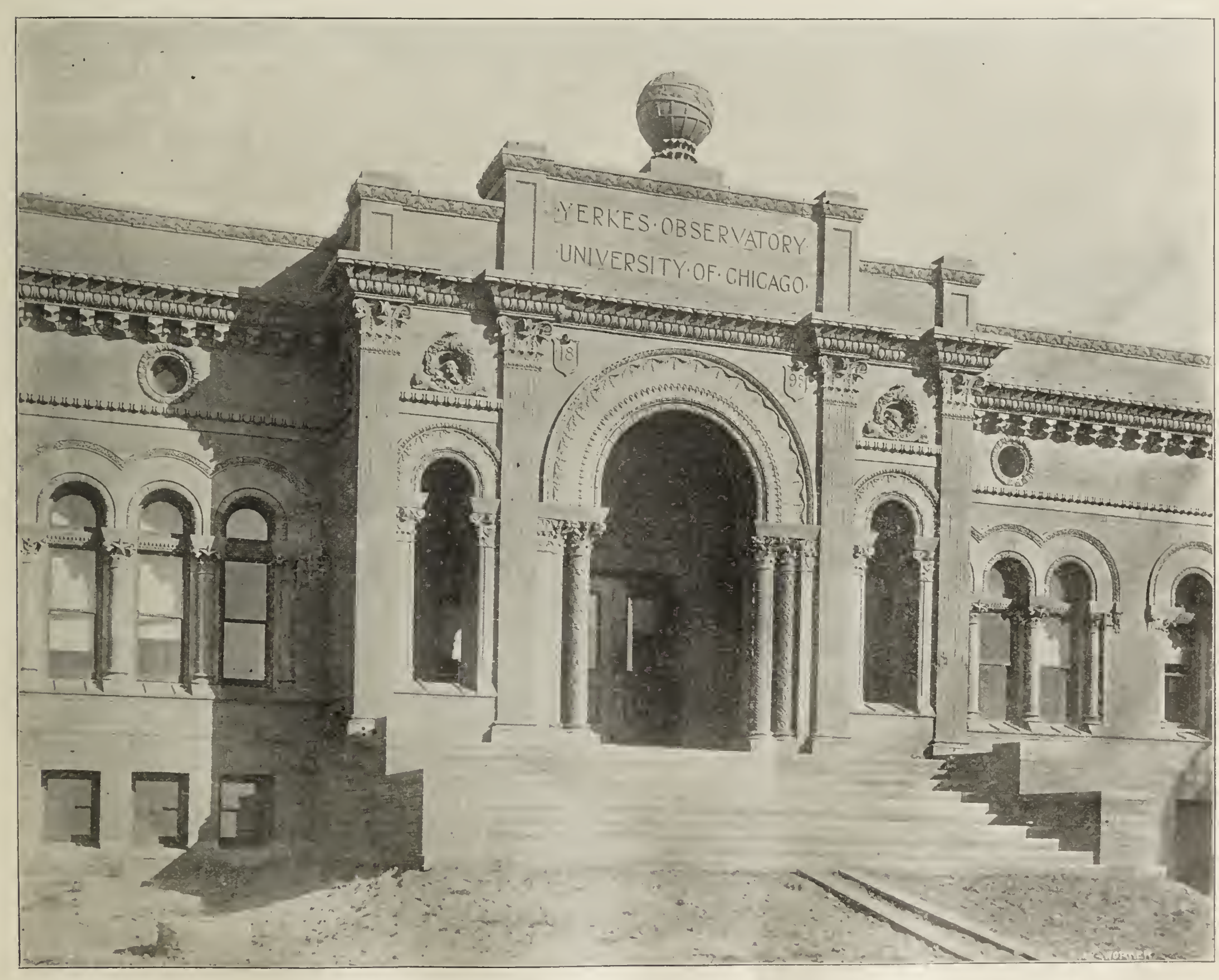
Written for The Clay-Worker.

A NEW USE FOR STONEWARE.

THE THONINDUSTRIE-ZEITUNG calls attention to a new and interesting use to which stoneware may be put. In the chemical industries of the present day, which, by the way, are the most enormous of the world, it is very often necessary to exhaust or to force large volumes of acid gases or vapors by means of fans. Wherever these are made of metals the corrosion resulting from the action of the vapors is a source of great loss, both in the wear of the fans as well as owing to the contamination of the products. The idea was conceived of making these fans out of acid-proof stoneware, and of late such have been brought on the market. A series of experiments were made to determine the most efficient shape of the blades and the speed at which the fans may be run. As a result they are now built so as to run quietly at very high speeds. The shafts running the fans are made of steel, of course, but are completely protected by stoneware shells, and are quite short. It was found that the new type of fan actually showed a greater efficiency than the old style. The remarkable fact also developed is that the clay fans are able to resist the strains due to the high speeds so successfully. The following figures will be found quite interesting in this respect:

	Diameter of fans, 21 inches.	16 inches.
Revolutions per minute.	Cubic feet of air moved per minute.	
1,200	2,118	671
1,400	2,471	776
1,500	2,647	812
1,600	2,824	883
1,800		988

In the experiments the speeds used were often much higher than these, but for continued work it is not advisable to exceed the above speeds.



Main Entrance Yerkes Observatory. Executed in Terra Cotta by The American Terra Cotta & Ceramic Co., Chicago.

Written for The Clay-Worker.

BRICK PAVEMENTS IN DETROIT.

Twenty-four Miles of Good Brick Streets—How They Were Laid and Other Matters of Interest to Brickmakers, Who Will Meet in the City of the Straits Feb. 5 to 10, 1900.

MAYOR W. H. MAYBURY, chief executive of the city of Detroit, whose ruddy countenance meets the gaze of the brickmakers of the country in the columns of The Clay-Worker to-day, will welcome the members of the Brick M'f'rs Association to the best that "the Convention city" affords when they assemble here in February next. Mayor Maybury is a most popular and efficient official, and has the distinction of delivering more welcoming addresses to national gatherings than any other man in the United States. Whether it is a medical convention or a cattle breeders' meeting he meets his audiences on their own ground, and he will, no doubt, surprise the assembled brickmakers with his knowledge of the clayworking art.

There is no disputing the point that Detroit appreciates the value of clay in the shape of bricks, as our many towering structures show, and our beautiful brick paved streets, and it is indeed a fitting place of meeting for the National Brick Manufacturers' Association.

Mayor Maybury and our beautiful city are blessed with a Board of Public Works that is famed for its efficient work and progressiveness. I will take the liberty of naming the board, so that when the brickmakers come to Detroit they may make the acquaintance of a set of men who thoroughly appreciate the value of brick as a paving material, and who had the moral strength to fight the Common Council clear through to the Supreme Court for the right to name the brick that they thought best to be laid in the streets of the city.

D. W. H. Moreland is president of the board, and the other members are Herman Kallman and Captain James Millen. Robert Y. Ogg is the secretary. These men were not in power, of course, when the first bricks went down on the streets of Detroit, some twelve years ago, but they early saw the value of it, and to-day there is over 24 miles of brick on concrete in the streets of Detroit.

Early in the season of 1898 the board discussed the question of brick paving with the Common Council committee on streets, and an agreement was reached that "Nelsonville," "Metropolitan," "Athens," "Union Paver" and "Buckeye" should be the kinds of brick used. These five kinds of brick are all produced in Ohio.

Hon. Wm. C. Maybury, Mayor, Detroit.

Two members of the committee went back on their agreement with the board, and instituted a fight in the Council to admit all brick that had passed a rattler test conducted by the

Bagg Street, West from Woodward. Paved with Nelsonville Brick in 1893.

Adams Avenue West. Paved with Nelsonville Brick in 1893.

city engineer. This covered 14 kinds of brick, many of which were considered inferior by the board, and the commissioners decided that Detroit should have good paving or no work would be done. And so the work was badly delayed until the position of the board was sustained by the legal authorities of the city and finally by the Supreme Court.

The board of estimates allowed $57,000 for repaving with brick on concrete last year. As the money allowed for this work was collected for that purpose, and could not be used for anything else, the board concluded, just as the fiscal year closed, that the Council should take all the responsibility, and a communication was forwarded conveying the wishes of the board that for the eight streets included in the $57,000 appropriation that all brick should be admitted and a ten year guarantee exacted. But the board feared that while the report for 1899 would show a goodly number of miles of brick paving, some of it would be of questionable quality.

The long fight was finally won, however, and now the board uses the following five kinds of Ohio brick exclusively: Nelsonville, Metropolitan, Buckeye, Athens, and Union Paver. All brick pavement is laid on a foundation of six inches of concrete, and repairing is attended with no difficulty whatever. All of the pavement laid in the city of the brick named by the board has been very satisfactory.

About the first brick pavement in Detroit, laid some 12 years ago, was of Hallwood brick, and it wears to the satisfaction of board and citizens alike. The present Board of Works and the board that preceded it have been eminently satisfied with brick when they could name the material, and they fought the Council on that point, because they argued that the men who devoted most of their time and thought to paving would be more likely to know good material than aldermen, whose knowledge was generally admitted to be exceedingly superficial.

Last year the board asked for more brick pavement than they were allowed. In 1898 the Council gave $57,000 in round numbers for brick, and this year the Council showed its attitude on the brick problem by giving the Board of Works $99,000.

Cedar blocks are used largely in the outlying districts, but brick is in great favor. Last year the board did not lay a foot of asphalt, as they held that $2 a square yard was a decent maximum figure for it, and the bids ran from $2.20 to $3. On brick, for repaving, the figure was set at $1.80 and the bids were all inside.

Many methods of testing brick having proved unsatisfactory, the board inaugurated a new idea in the matter of testing material, which met the approval of contractors and citizens generally. The fourteen kinds of brick which passed the rattler test (which, by the way, does not show the absorption or freezing test) were laid on Franklin street, between Beaubien and Antoine streets, under the supervision of the board. Franklin street is down by the river front and close to the freight depots of three railroads. All teams going and coming will use that street, and the test to which the bricks will be put during the fall, winter and spring will give the people of Detroit a thorough knowledge of the best brick for wear, which will be worth more than the tests of a thousand rattlers.

Special attention has been paid by the board of public works to the repaving of alleys in the down-town district. Within the half-mile circle there are scores of the old-time cobblestone alleys on sand foundations, which are very unsanitary, and a catch-all for refuse and filth of every description. During the past year eight of these were torn out and replaced with vitrified brick on concrete foundations, which is a better pavement in every way, more satisfactory, and easier to keep clean.

The foreign commerce of the United States seems likely to make its highest record of the century in the closing year of that period. The October exports are larger than those of any peceding October, the total for the ten months ending with October is greater than the total for the corresponding period in any preceding year, and it is apparent that for the first time in our history the foreign commerce of the year will exceed two billion dollars. For the ten months ending with October, 1899, the figures of the Treasury Bureau of Statistics show the total exports to be $1,029,242,000, while in the corresponding months of last year they were $987,879,000.

Written for The Clay-Worker.

BRICK PAVEMENTS IN CLEVELAND, OHIO.—No. 2.

WE CANNOT LEARN that any fire clay pavers were laid in Cleveland after 1890, though in this we may be mistaken. At any rate, all pavements laid later and examined by us seem to have been from shale brick or blocks. We do not deem that this arises from any dissatisfaction with the fire clay article, for the pavements alluded to as laid in the use of them are a standing evidence that fire clay pavers of a most excellent character were being made ten years ago, and no doubt better ones have been made since. Shale clay manufacturers have an inside track in the Cleveland market, being near at hand, with freights in their favor.

There are some peculiarities in the paving specifications to be noticed. At any rate we have found them in the specifications of no other city, and find it is stipulated that the pavers "shall be burned in down-draft kilns," and that the depth of the brick or pavers shall be 5 inches, and not less than 2½x8½ inches in thickness and length. It is also stipulated that there shall be a recessed end and projections on the sides to keep them a proper distance apart when laid—unless the chief engineer shall fail in securing such, in which case he may accept others. It may be further noted that the specifications do not require round-cornered or repressed pavers, the wording being "best quality of sound, hard-burned, machine-pressed paving brick, to stand all reasonable tests as to durability and fitness required by the chief engineer and to which paving material is usually subjected." Another evidence that our Cleveland friends depend largely upon the good judgment and faithfulness of their engineeer.

The specifications leave the question of filler to be employed an open one, mentioning Portland cement, asphalt, coal tar and Murphy grout, and, fortunately for the city, we think, cement has been generally employed. We are advised by Mr. Bayne, of the engineer's office, already quoted, that since 1895 shale blocks 3½x5x10 inches in size have been favored rather than brick. These we believe have been largely furnished by the group of four companies represented by Messrs. J. P. Higley & Co., of Canton, two of which are presided over by B. F. Many, of Cleveland, to whom we are indebted for open doors and a cordial reception as a representative of The Clay-Worker at the offices of both the city and county officials.

In 1897 and 1898 three pieces of brick paving were laid on other lines than those already named, viz., on concrete foundations, in which we understand that natural (Louisville) cement was employed, these foundations being but 6 inches thick, instead of 8, as required when sand or gravel is made use of. We saw but one of these pavements, viz., that on Wade Park avenue. We noted that it differed from other pavements we had seen in the city in that the cement had been so made to fill and flush the joints as to make one continuous surface, similar in character to the pavements we have referred to in Terre Haute. This we were pleased to notice, for it gave us the assurance that with such pavements before the eyes of the Clevelanders as an object lesson must result in the early taking of the advance steps generally throughout the city which shall end in the securing of a reasonably noiseless pavement in the use of brick and blocks. We were told at the engineer's office that these several short pieces were laid as an experiment.

—The Guarantee Required—

Of paving contractors in Cleveland is not burdensome, but the specifications are such that if the contractor and inspector are disposed on the one hand to perform according to contract and on the other to require a living up to the terms of the contract that there can be no question of loss from repairs required by the contractor during the three years covered by his guarantee, during which time, if any portion of the pavement is removed for any cause, the contractor is to replace for a stipulated compensation, so insuring, as we might expect, the doing of this in a proper and workmanlike manner. Such easy terms with the contractor are quite at variance with Chicago methods in vogue, in which a ten-year guarantee is required, and we submit that now the wearing quality of paving brick has come to be so well known, and satisfactory methods of laying better understood, the Chicago method should give place to the Cleveland, to the relief of both the taxpayer and the contractor, and to the loss only of guarantee associations.

We believe this requirement to which we have alluded, of a paver 5 inches in depth, is a move in the right direction. Paving brick manufacturers may be disinclined to adopt such a standard, but we are sure that in the long run the paving brick industry will profit by it. The objection urged will be that seconds will not be so readily disposed of, as if of building brick (approximately) size. This fear is gradually being dissipated. The growing demand for vitrified brick for foundations for railway culverts and sewers, which is making such rapid strides, insures not only the ready sale of second-grade pavers, but is already demanding the making of large quantities of stock above what can be sorted as seconds from paving stocks, and for the first two purposes mentioned the largest size will be sought. We say we believe the 5-inch depth requirement is a move in the right direction—

First—Because the comparatively small added cost of the blocks arising from the one inch addition to its depth will add over 50 per cent. to the strength of the cemented arch forming the pavement, taking as a basis the rule laid down as it relates to the transverse strength of structural material, viz., that the strength is as to the square of the diameter.

Second—This proposition acted upon will insure the laying of more roadways upon good natural sandy foundations, such as were referred to in our last paper.

We have already referred in this series of paving papers to what has come under our observation concerning the strength of a properly laid and cemented arched roadbed, as supporting for years a heavy traffic, notwithstanding the evident existence of voids or spaces beneath the brick where the pavement was unsupported by the crushed stone and sand foundation. If then we add 50 per cent. to the strength of such a brick or block covering we have taken a long step towards popularizing a pavement which should find a large place in the paving operations of the future where natural foundations are to be had. We do not wish to be understood as setting a lower standard, and we trust we shall not be misunderstood on this point. Those who read our former paper on Cleveland pavements know that we are basing our argument upon the facts which presented themselves in that city, and we are now only showing how assurance may be made doubly sure when an added factor of 50 per cent. of strength may be had, and that this strength may be secured at comparatively small cost.

—Suburban Brick Roadways.—

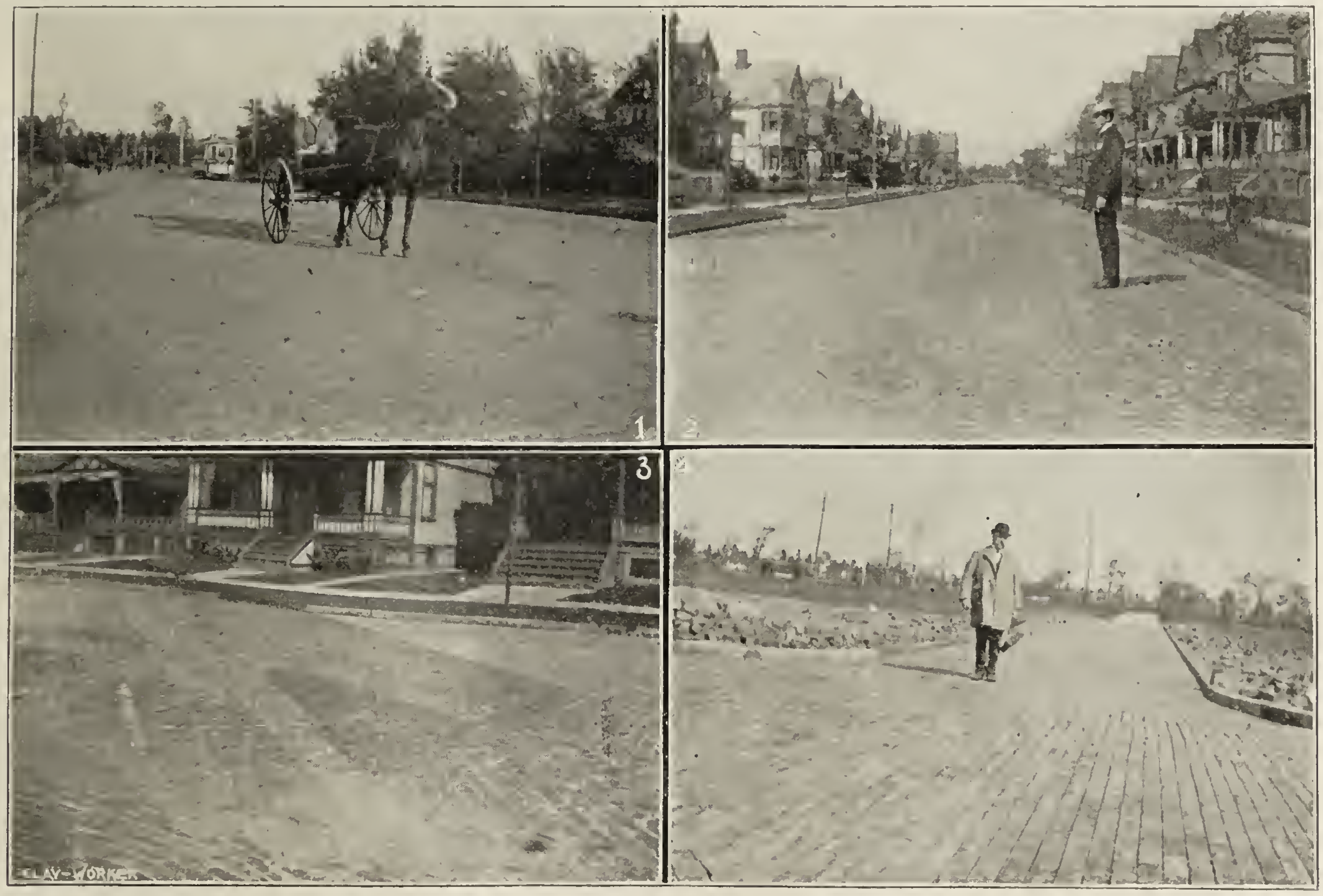
Before dismissing Cleveland pavements we desire to call attention to some facts that will be of deep significance to all who are interested in paving brick, whether as makers, dealers or lovers of good roads. In this day of an increasing general interest in the establishment and maintenance of good roads there are multitudes who will hail with satisfaction and watch with interest the work that is being done by the Commissioners of Cuyahoga county in this line.

We may be mistaken when we assume that the work being done in the suburbs of Cleveland and outside of its corporate limits is in advance of anything as yet undertaken, and equally as well advanced elsewhere in this country. The gentlemanly and accommodating clerk of Cuyahoga county, Julius C. Dom, Esq., has kindly furnished us with some facts concerning this work, which we place before our readers. We quote his words: "To provide for the construction of improved roads we are authorized by the law to levy a tax of five-tenths of one mill on all property, real and personal, in Cleveland city and the villages of the county, and a tax of 1 5-10 mills on all property, real and personal, in the hamlets and townships of the county. This levy produces about $95,000 per year for special road purposes."

With such funds at their disposal the Commissioners have already accomplished the laying of about 18 miles of brick roadway outside the city limits, and laid naturally upon the main roads leading into the city.

We are able, through the courtesy of Mr. Dom, to present some figures of cost in connection with these various roadways, and also of some stretches of macadam and slag, that some comparisons of cost may be had.

We are sorry that we are not able to divorce the cost of the brick paving proper from other items of construction, and also the macadamizing as a separate matter, but as the work was done under general contracts, including grading, drainage, culverts, etc., this has not been possible. Those familiar with prices in their own section will be able to calculate the difference of cost between the several systems of road surfacing, which will vary considerably, as freight charges enter into the calculations and pertain to the various materials employed. We are aware that the varying costs of grading, drainage, culverts, etc., arising from the topography of the region traversed and the character of the material forming the surface will prevent the costs given for the different section of roadway from being of any special service beyond that of enabling parties who may desire it to approximately judge of costs under the different systems.



Clevelands Brick Streets. 1. Wade Park Avenue opposite Entrance to Boulevard—Pres Eggers and his favorite Roadster. 2. Hazard Street between Superior Street and Payne Ave., laid in '95. 3. Bolton Ave. near Euclid—all three are Cement filled. 4. A new Paved Street before Application of Cement Filler.

—Wooster Pike, Sections 1, 2 and 3.—

Distance covered, 4 miles.
Brick roadway, 8 feet wide.
Earth roadway, 16 feet wide.

Total cost of engineering, inspecting, grading, drainage, paving, etc., $70,000.

In other sections of the same roadway we are able, in part, to divide the several items entering into cost as below:

—Wooster Pike, Sections 3, 4 and 5.—

Distance covered, 4 miles.
Brick paving, 8 feet wide.
Earth roadway, 22 feet wide, 6 feet wider than the previous sections.

Cost as follows:

Grading, drainage, paving, etc.	$47,665.34
Engineering	2,927.45
Inspection	1,023.00
Miscellaneous, advertising, etc	188.82
	$51,804.61

South Woodland road.
Distance covered, 4¼ miles.
Brick pavement, 8 feet wide.
Earth roadway, 20 feet wide.

Cost as follows:

Engineering	$3,393.65
Printing, specifications, etc	210.50
Inspection	1,359.00
Grading, drainage, paving, etc	48,503.94
	$53,467.09

It will be noticed that the first four-mile section of the Wooster pike cost $70,000, while the second section of the same length and width, an earth roadway six feet wide, cost $51,804, the difference in the cost, no doubt, being due to engineering difficulties. As the third section noted corresponds very closely in cost with the second section, it may be taken for granted that the two latter sections are more trustworthy guides for estimating under ordinary conditions.

We next call attention to a section of roadway which we have on two occasions, months apart, visited and carefully inspected. It is perhaps the most important of the brick roadways leading out of the city, the brick bed being sixteen feet in width. It is called the

—Loraine Road Improvement.—

Distance covered, 3 2-3 miles.
Brick pavement, 16 feet wide.
Gravel turnpike, 18 feet wide.
Electric car roadbed, 16 feet wide.
Total width, 52 feet.

This road was not fully completed when I obtained the figure of cost. The estimate was $70,000, on which payments had been made as below:

Engineering	$4,801.43
Specifications	94.50
Inspection	988.00
Construction	39,292.20
Culverts	2,301.32
Plank road	2,789.99
Advertising	106.12
	$50,373.56

As against these sections of brick roadway we present two sections of macadam as follows:

—Bedford Road.—

Distance covered, 5 miles.
Macadam roadway, 16 feet wide.
Earth roadway, 16 feet wide.
Total cost of engineering, inspection, drainage, grading and paving, $70,000.

—St. Clair Road Improvement.—

Distance traversed, 2¼ miles.
Slag roadway, 16 feet wide.
Earth roadway, 16 feet wide.
Total cost, $28,000.

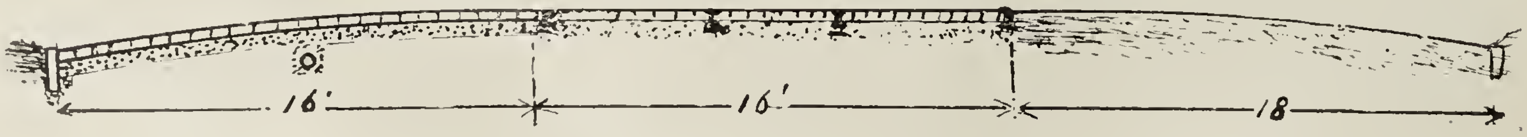
The reader will notice little difference in the cost per mile of the above pieces of macadam and slag as against the eight-foot brick pavement, the second and third stretches on which costs were given. This may be said to the general observer. Of course the contractor and expert will readily sift out and settle upon relative costs in his own locality. The figures are given as generally indicating the cost of this class of roadways.

—Referring to Specifications—

Of the Loraine road improvement, which most interested us, we notice bids were received or permitted for paving brick, asphalt, block and Telford macadam, the Commissioners reserving the right to make their selection after the opening of bids. We give a cross-section view as we understand the specifications.

The sixteen feet set apart in the center of the street, as shown, for a double track of an electric car line, was to be simply graded by the contractors for the road work, the car company doing the balance of the work on that section. We noticed that the work done by them was of a superior character, the top of the rail being flush with the face of the paving brick. The brick laid within the rails were eared at one end, as shown, to be held in position under the rail, as is common where good work is done, and the pavers within the section devoted to car tracks were well laid in the use of a cement filler.

Referring again to the specifications, we find that the 18 feet of earth roadway was simply to be rolled solid and then scraped with a wheel scraper to bring it into conformity to the grade stakes, which, as it had long been a well-worked and traveled road, would render it very acceptable to the driving public except in wet weather, when it would not be likely to be rutted, as all traffic would naturally be over the brick. Boiled down, the specifications as relating to the brick section are as follows:



First—A curb stone 4x14, set on 4 inches of gravel.

Second—A bed of six inches of broken stone or furnace slag passed through 2½ and ½-inch screens, or, in lieu of it, coarse gravel.

Third—Before such deposits sub-grade, to be well rolled with a ten-ton roller to the satisfaction of the engineer, any spongy material found to be removed and replaced with broken rock or gravel.

Fourth—In the center of the paved section a further excavation for drainage purposes, one foot deep and wide, in which to lay a five-inch vitrified pipe, to be filled around with the foundation material, carefully tamped (as seen in sketch).

A Brick Paved Country Road.

Fifth—The foundation material to be covered with clean, coarse sand in sufficient quantity to fill the voids and leave a half-inch top-dressing.

Sixth—Such foundation to be rolled with a ten-ton roller 25 times, or to the satisfaction of the engineer, when a further addition of sand is made to secure a suitable cushion for pavers.

Seventh—On this foundation pavers to be laid in the usual manner and filled to full depth of block with a composition of coal tar and asphalt or bituminous grout, as Commissioners may approve, not less than 10 per cent. of asphalt being used. When heated such filler was to be flooded over the pavement and swept in hot, all to be covered later with a light coat of sand.

A photographic view of this pavement is given. It was pleasant to note a load of hay containing two tons or more passing into town on a brisk trot, apparently with no more demand upon the horses than drawing a spring wagon over a good earth road.

We made two trips to this roadway, several months intervening between our visits. To our view there are some things for which due provision has not been made, chief among which is that there seems to have been no provision for the disposal of surface water. It is left to find its own way of exit. Some sections of the road will at times be subject to flooding, and there will be an accumulation of droppings and debris that might have been naturally and without cost largely disposed of. This will no doubt be remedied in time. We could wish that cement had been employed as a filler, for the reasons before given.

In our last trip to this section, in that region of the city lying between the river and the city limits, we counted twelve or thirteen intersecting streets being laid with brick, and some seven or eight more that had been laid the present season in the use of the world's best paving material—a well-made and burned paving brick.

E. G. DURANT.

Written for the CLAY-WORKER.

PAVING BRICK, PAVING BRICK MANUFACTURERS AND STREET PAVING.

BY GEORGE J. M. ASHBY.

CONTINUING OUR VISITS to some of the paving brick plants within reach of the Chicago market, we come to the capital of the State—Springfield. Here are three plants that manufacture paving brick, and, taking the smallest first, we find ourselves at the works formerly owned by Utt Brothers. At the time of our visit the plant was in a receiver's hands, and was to be offered at public auction the following month (this present December), on account of a mortgage of $10,000. The works were running under the management of Mr. Utt, but they are rented or leased by Hickox & Mesters. These works appear to be considerably run down, not to say dilapidated. The machinery consists of an auger brick machine, "an intermediate Wonder," which, though it does good work, is not large enough for the requirements; a Frost dry pan, and an engine of local make. The latter, Mr. Utt said, was very unsatisfactory. In all probability, when the plant was started, the engine, in a spirit of mistaken economy, was selected as small as was thought possible. The way the engine labored and the rush of live steam escaping made us feel no inclination for loafing around the boiler house. A seven-track dryer and twelve kilns, one square up-draft and eleven round down-draft from 20 to 26 feet in diameter about complete the equipment. There are no represses here. This would, perhaps, be accounted for by the fact that the manufacture of paving brick formed a much smaller proportion of the work than building brick. From the beginning of the season, Feb. 1, the year's output of paving brick would only be 500,000, the rest of the manufacture being building brick, of which 4,000,000 would be made before shutting down for the winter.

Hickox, Ridgly & Co.'s Brick Works, Springfield, Ill.

From the works leased by Hickox & Mesters we proceed to the second, which is leased by Hickox & Ridgely. This is the same Hickox. Ridgely is a local banker, and it is probably that both the brick plants have their accounts at the same bank. The works, which run under the name of Hickox, Ridgely & Co., were formerly known as those of Elcock & Sulzaberger. They were established by Mr. John Elcock in 1890. Mr. Elcock is, we are informed, still the owner of the plant, which he leases to Hickox, Ridgley & Co., and superintends for them.

As a rule some lesson may be learned from every brick works, however small, and the feature of special interest and, we think, of value, here was the method of burning brick.

Most of us know the difficulty, when burning in a down-draft kiln, in getting the fire down to the bottom of the kiln. In other words, in burning the lower courses good and hard. This difficulty Mr. Elcock has evidently overcome, if we may judge from the building brick that we took from the very bottom course in a kiln which was being drawn.

The trick is a very simple one—as simple as the Columbus egg.

Mr. Elcock spreads a layer of coal dust (coal slack) two inches thick over the floor of the kiln, and on this he sets his brick. The slack coal used is the ordinary bituminous coal of the district, and costs about 25 cents per ton.

As may be supposed, this method can only be employed in kilns with solid floors. It would, obviously, be impracticable on perforated floors. The kilns here are eight in number, all 24 feet in diameter, and hold about 40,000 brick each. None of them have perforated floors. The flues under the floors are not complicated. The main flues from the stacks have an opening direct into them in the center of the kiln. This opening is 18 inches in diameter. The main flue measures 2x2 feet. Connected with this flue are two circular flues, one with a radius of four feet from the center of the kiln, the other with an eight-foot radius. The inner circle, or main ring flue, is 10 inches wide. It is connected by five flues with the opening in the center and hence with the stacks. There are six openings in the kiln floor into the main ring flue. The outer ring flue is not so large as the inner. Its width is six inches. It is connected by means of five flues with the main ring, which, in its turn, is connected by five flues with five separate stacks. The kiln in which we took these measurements was 20 feet in diameter.

We said above that Mr. Elcock's plan of spreading a two-inch layer of slack coal over the floor of the kiln gave excellent results for common building brick. It is reasonable to suppose that it would be of considerable, if not of equal, advantage when burning paving brick. We had no opportunity of forming an opinion upon this point, as Hickox, Ridgely & Co. have never made paving brick, though Mr. Elcock made them for a couple of years, but discontinued this branch of manufacture three years ago.

Half a mile of Kilns—Purington Paving Brick Works.

Before leaving this subject we wish to repeat our conviction of the value of this simple plan of Mr. Elcock's, and also to express thanks for the kindness and generosity with which he gave all possible information for the purpose of being published in The Clay-Worker for the good of the craft. It would be a good thing for those of our members of the N. B. M. A., who have solid floor kilns, to use a layer of slack coal in the manner described and report upon it at the next convention.

The machinery here consists of an auger brick machine, "Decatur Leader." This produces 25,000 bricks per day, though the machine is stated to have a capacity of 40,000; but, if this number were turned out, it would not be possible to take care of them, as the rest of the plant is not large enough. The brick are end-cut, on a "Leader" automatic table, with revolving reel. There are no represses, for which there would be no use, as only building brick are made. A ten-track steam dryer, 75 feet long, is home made. The steam is taken through straight pipes, instead of the usual coil, but we learned that the pipes do not give off enough heat, and the dryer is considered to be too short. Our experience is that, as a rule, home-made dryers are not a full success. A dry pan and a 50-horse-power "Erie" engine completes the list.

The clay here is shale and common clay. The brick are made of a mixture of half of each. When paving brick were made the proportions were two-thirds shale and one-third common clay.

From the Hickox, Ridgley & Co. plant we go to that of the

—Springfield Paving Brick Company.—

None of us that were present at the annual convention of the Illinois Clayworkers' Association, at Streator, four years ago, will forget the inimitable toastmaster, to whose genial humor and sparkling wit the great success of the meeting was mainly due. The gentleman was Dr. Converse, of Springfield, Ill. It is this same doctor who is president of the paving brick company.

Of the various paving brick plants we have visited on this tour, that of the Springfield Paving Brick Company is the only one, so far, that can be considered of any importance as a source of supply for a great city like Chicago. The capacity of the works, if running all the year, would be 15,000,000.

The paving brick here are made of shale, with the addition of one-fifth of common clay. They are burned in Eudaly kilns. There are seven of each, holding 160,000 paving brick or 180,000 building brick. The Eudaly kiln is much too well known and in too general use to need any description. In addition to the seven Eudaly kilns there is an up-draft kiln holding 400,000 brick. The paving brick made here measure 2½x4x8½ inches. The brick machine is a Penfield auger, and does good work. There are four Raymond represses here, but repressing has been abandoned in favor of a new method, of which we will speak presently.

The manufacture of the ware presents nothing unusual, either in the preparation of the clay or the burning. The raw material is ground in dry pans, mixed in a pug mill and passes out from the auger in a stream of clay, which is cut up by a revolving cutter into end-cut brick, but just here there is a notable novelty, which is the substitute for the repressing referred to above.

The plan is exceedingly simple, as all good plans are, and a man, on seeing it, will wonder why he never thought of it himself.

It is generally agreed that vitrified brick for paving purposes should not have sharp corners, but that the corners presented by the brick when laid in the street should be rounded.

The Purington Paving Brick Co.'s Plant- Works No. 2 in the dim distance to the right.

Whether this be right or not is a matter of opinion, but, as it is an opinion held by city engineers, it has to be deferred to. The way in which these rounded corners have hitherto been produced is to take the brick that had been cut off from the stream of clay, place it in a mold in another machine and bring down a plunger upon it, thus squeezing it into a different shape—in other words, repressing it.

Opponents of repressing have had much to say about this process breaking the bond or structure of the clay forming the brick, but such a contention, we think, is simple nonsense. Clay undoubtedly has a structure as it lies in the bank, a structure that has been produced by the deposition of the particles of matter, by the way in which they have arranged themselves side by side and above and below each other, by the effect of pressure, of contraction, of expansion, during hundreds, thousands, perhaps millions of years.

What do we do with this structure?

By blasting with dynamite, by exposing to the influence of the weather, by crushing with rolls, by grinding with dry and wet pans, by slumming, or by kneading and churning in pug mills, we as utterly destroy and annihilate every trace of structure as it is possible for human ingenuity to do. Our great aim is to make the clay thoroughly homogeneous and plastic, so that each particle of clay slides upon its fellow.

And, after we have done all this, we talk of structure!

If there be any structure at all it changes at every instant in the pug mill, at every movement of the auger, and it changes again as the stream of clay finally emerges from the mouthpiece of the brick machine.

If there be any structure or bond or grain in the brick cut off from the bar of clay, what is there about it that should make it sacred from all further change a few seconds later in the repress?

The mistaken notion about a structure or grain in the prepared clay arises, probably, from observation of clay that is not thoroughly worked, or of a brick that has slight lamination. A perfect brick is absolutely structureless, so far as the composition of the clay is concerned.

But there is a reasonable objection to repressing, and this is the extra expense for the machine, the handling of the block and the oil with which the mold has to be lubricated. A real objection, and to our mind the principal one, is that the repressing is too often done in a very perfunctory manner, the pressure put upon the brick in the repress not being nearly sufficient.

We have been guilty of rather a long digression, but the description of the new method will take but very little time. The bar of clay, issuing from the mouthpiece, has four rounded corners, given to it by the die. The problem was to round off the corners at the ends, or heads, of the brick. This is done by two sliding pieces, between which the stream of clay passes before it is cut, darting in at regular intervals, making a V-shaped indentation about three-eighths of an inch in depth, into which indentation a wire of the cutting reel falls and cuts off the brick, ready to be placed on the dryer car without any further handling. The brick thus finished has eight rounded corners, and some burned block that were shown to us were fully equal in appearance to any repressed brick.

It is right to say that there is no doubt the actual inventor, the originator of this idea, is Dr. Converse. It occurred to him, and he directed the engineer to work it out. It was considered to be a success, but Dr. Converse very generously presented it to his superintendent and his engineer, who applied for a patent for it. Fortunately for them, they discovered in time that the name of the original inventor had to be included in order to make the patent good, so the doctor's name appears on the patent, although he disclaims all interest in it.

Purington Paving Brick Co.—Number Two Yard.

Our tour of inspection of paving brick plants finishes, for the time, at Galesburg, the greatest center of paving brick manufacture in the world. It seems to be the natural destiny of these United States of North America to have the biggest of many different kinds of things, whether the rest of the world likes it or not, and among these "greatest on earth" is the paving brick industry at Galesburg. And this vast industry has been developed within less than a quarter of a century, for, we believe, that it was in 1878 that the first bricks ever made from shale were produced at Galesburg, and were found to be good.

Taking the biggest enterprise here, that of the

—Purington Paving Brick Company—

We find that it was organized in 1890, with a capital, fully paid, of $500,000. The president is D. V. Purington, whose name is a household word with brickmakers throughout the land. W. S. Purington, a younger brother, is vice president, and C. H. Chamberlain is secretary. The area of the two plants, the upper and lower yard, is 75 acres, and 300 hands are employed, while two steam shovels, like huge antedeluvian monsters knawing at the clay banks, each do the work of twenty men.

Four auger machines, all made by Chambers Bros. Co., of Philadelphia, have a united capacity of 300,000 bricks per day.

There are four dryers 84 feet long; three of them have 16 tracks each, the fourth has 20 tracks, giving a total of 68 tracks, a drying capacity greater than we have ever met with anywhere else. All the dryers are similar in construction to those of George Sharer, of Philadelphia. They are direct heat dryers, and the fuel is in some crude oil, in others coal, but we believe some important modifications are about to be made in the method of drying.

There are 27 kilns, all of them square down-draft. Twelve of these are Eudaly kilns, each with a capacity of 160,000 bricks, and 15 Graves kilns, with a capacity of 200,000 each.

Eleven two-mold represses, eight "Eagle" and three Raymond, are working here, and eight of the well-known Frost Manufacturing Co.'s dry pans. Motive power is supplied by a St. Louis Corliss engine of 350 horse-power, and a Hamilton Corliss of 225 horse-power. There are some other smaller engines about the place. A railway engine is devoted to the exclusive service of the brick works for switching purposes, and the two clay shovels has each its own engine. Each of these shovels at every stroke scoops out two yards of clay from the bank.

The lengths of light railway tracks in the works, the number of dryer cars and cars for hauling clay, run into high figures, but the most eloquent of all the figures were those showing the quantity of paving bricks shipped from the works during the month of October last, when 10,250,000 bricks, loaded into 1,656 railroad cars, were sent out.

The weight of the manufactured material thus dispatched during the one month, as shown by the railroad charges, was 72,949,460 pounds.

But this is not all that Galesburg can show, for in addition to this greatest paving brick works on earth, with its annual output of 60,000,000 bricks, there are three others, the Galesburg Paving Brick Co., Galesburg Brick and Terra Cotta Co. (making only paving brick) and the Galesburg Vitrified Brick Co. These three have a united capacity of 125,000 paving bricks per day.

RUSSIA AS A MARKET FOR BRICKMAKING MACHINERY

IT IS HARDLY NECESSARY to say, as it is well known, that Russia, with its virgin state of manufacture, is an enormous field for all kinds of tools and machinery, and by careful observation we notice how willingly the Russians adopt any implement or machine, the advantages of which were practically proven. Take, for instance the harvest machinery. They are in use all over Russia. No farmer is without them. One will find there a great many different machines which were introduced with no less success by foreign countries.

Among some other industries in Russia brickmaking was left very far behind, as the Russian brick manufacturer has but a faint idea of any modern machinery for making his ware, and the old traditional handmaking process still finds place in that country. This is a market where I would suggest our makers of brick machinery to look for trade. There is no use to wait for it; go after it. I will admit that the Russian people are very skeptical, but there is no difficulty in doing business with them by one who is familiar with their language, habits, demands, etc. Just give them the right thing, convince them of the advantages and merits, and especially make them understand your instructions as how to use it, and there is nothing easier than to trade with the Russian people.

I. A. LEVITT.

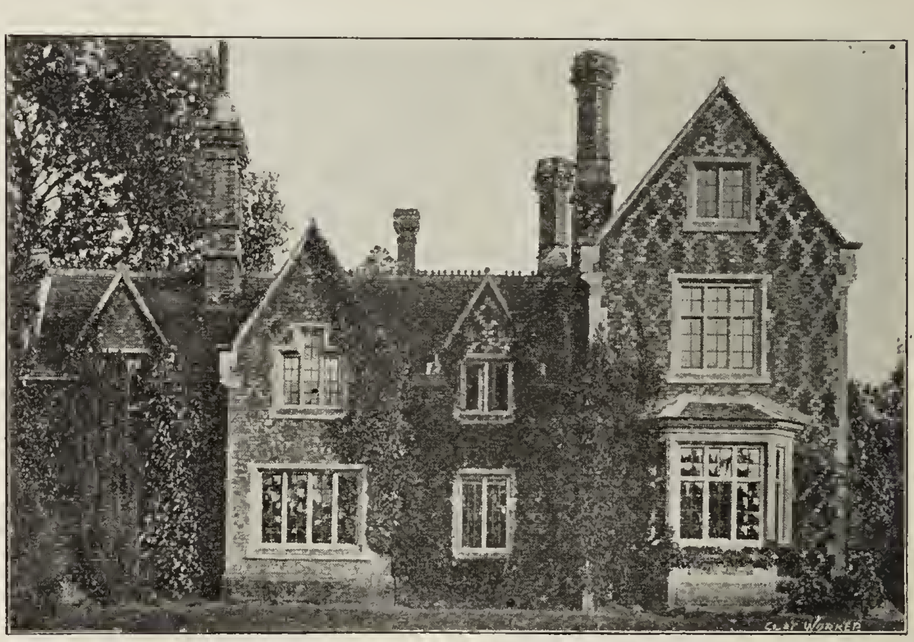
Written for The Clay-Worker.

"ENGLISH BRICK COTTAGES." No. 2.

IN THE FORMER PART of this article, in the November Clay-Worker, the reader will remember I spoke almost exclusively of the oldest English cottages. They, I said, superseded the old mud hut and other rude dwellings; these of which I now speak are the successors of the thatched cottages. We have no such marked differences in the history of American brick building, but if we revert for a moment we find a parallel in wooden structures. The old log hut and the modern frame house form a contrast equal to anything to be seen in English brick structures. Let me say here, though I may refer to it again, that the brick houses built in the middle West in the early part of this century are not prophetic of what brick houses will be in the coming century. They, generally speaking, are poorly built, poorly arranged, and damp. I hope at some time later to make an exhibition of such old houses, together with some recent specimens as found in the rural parts of Ohio.

This is an old village rectory. It presents a more modern appearance than the antique cottages spoken of before. It is a beautiful home, standing on the hillside near the old church. In it the parish priest, with his plain family, makes his abode, and to it rich and poor alike go for spiritual counsel and comfort.

"His house was known to all the vagrant train,
He chid their wanderings, but relieved their pain.
The long remembered beggar was his guest,
Whose beard, descending, swept his aged breast.
The ruined spendthrift, now no longer proud,
Claimed kindred there and had his claim allowed.



An Old Village Rectory.

The broken soldier, kindly bade to stay,
Sat by his fire and talked the night away,
Wept o'er his wounds, the tale of sorrow done,
Shouldered his crutch and showed how fields were won.
Pleased with his guests the good man learned to grow,
And quite forgot their vices in their woe."

A hospitable place, indeed—not elaborately furnished to alienate the poor or patronize the rich. It is what it ought to be—a model of economy and neatness, and a meeting place for all.

As to its age, I do not know anything definite, but it is not over sixty years. The walls are checkered by working in a light colored brick symmetrically all over the building. The corners are built of a cream-colored brick all the way up. It is a good sample of that kind of a modern house. Its chimneys add much dignity to it, and might be copied in this country for the dignifying of many dwelling houses. Of course, there is an English atmosphere about it. Its windows and general construction at once show it. To us Americans it seems absurd that in a house of that size there should be no bathroom. Yet in very few English houses does one find them. I do not wish to give the impression that the British never bathe except when they go to the seashore. If that were so, many would never get a bath, for thousands never go to the sea. The lack of such conveniences is a defect in English houses. At the disposal of the guest is placed a large movable zinc bathtub, but on a winter morning what American would want to go through the ordeal of being thawed out of a bathtub?

The Old Parish Church.

The old parish church stands hard by the rectory. It is not built of brick, but in a collection of village pictures it would be a mistake to omit the village church—the people would feel insulted. As I have said before, a brick church built before this century is an anomaly. This old church has had an existence in some form or other since the twelfth century. There are traces in the original in the chancel. For several hundred years it has been

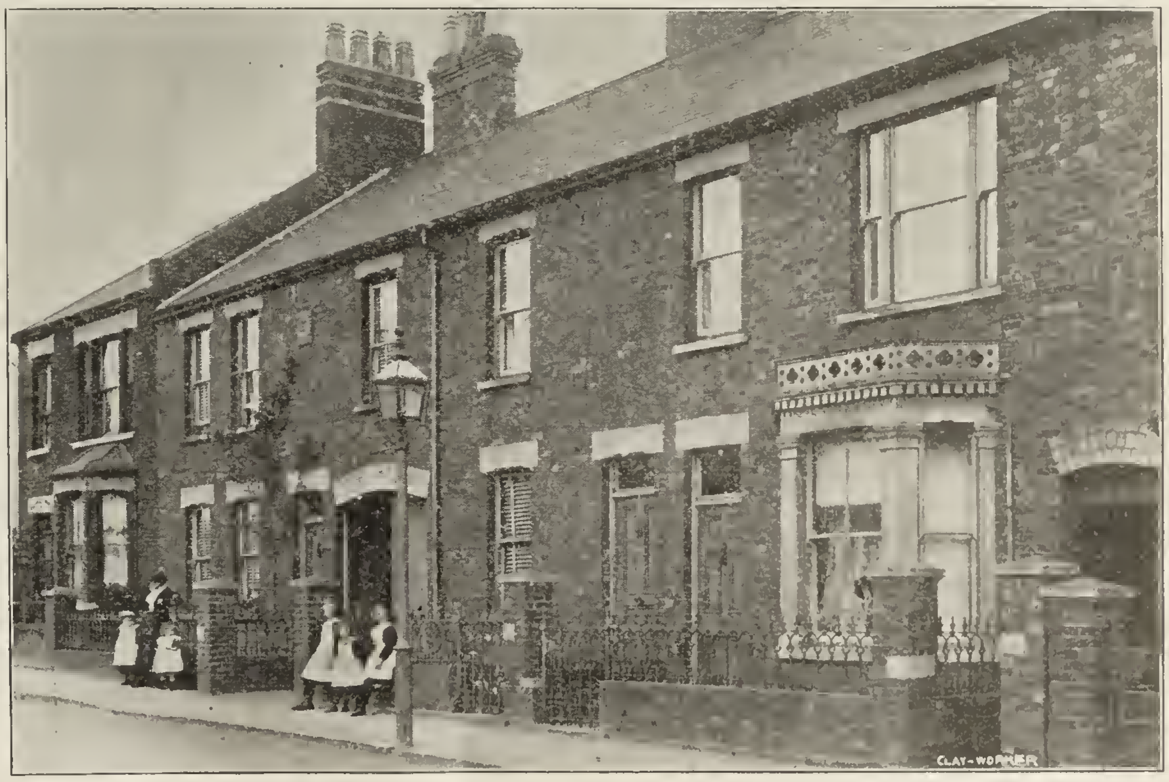
"The decent church that top't the neighboring hill."

As the expatriated Englishman goes back to his native land and sees dwellings like the above standing where once stood the humble but happy cot of the shepherd and the plowman, he feels much as Goldsmith did when he thought of the changes going on in his time:

> "Even now the devastation is begun,
> And half the business of destruction done;
> Even now, methinks, as pondering here I stand,
> I see the rural virtues leave the land."

A great change is going on in house building in rural England. Where the above houses stand, as well as those in the pictures below, the writer, though young, remembers the thatched cottages which these have supplanted. Railway interests have grown so immensely that all the main roads are bordered with brick-built villages and towns. Quaintness has given place to usefulness. The fittest survive. This is a row of modern cottages occupied by railway employes. They are two full stories in height, and have all the outdoor conveniences common to American life. On account of the great price of land for building purposes, however, the houses are not as large as they should be. The conventional number of rooms are planned, but they are all too small. The houses are all well built and pretty safe against fire. No more wood is used—because of its great price—than is absolutely necessary, thus reducing the amount of combustible material. The brick wall inclosing the little strip of ground between the doors and sidewalk will be noticed again with interest. A bed of geraniums or the like beautifies the little plot of ground. Slate is used on the roof; all roofing is done with slate or tile.

I might say, before going further, that the quality of the building depends on the nature of the property. If the land is freehold, then the house is well constructed, and a century of time will not witness much defect. But if, on the other hand, the land is held on a lease, as a great deal of such land is, the houses are erected to stand as nearly the length of the lease as possible. It was said by a writer on the subject, a few years ago, that London is renewed every century for that very reason. Few of the houses in London, comparatively speaking, are freehold. After this lease period, which seldom exceeds ninety-nine years, is gone, the houses become the property of the landlord who let the ground. The interest of the builder, therefore, is to so construct that the landlord will receive but little besides his land when the lease expires. In consequence, the goodness of the bricks becomes only a secondary object. Their cheapness is the principal point.



A Row of Modern Brick Cottages, Duncomb St., Bletchly.

The object of the brickmakers, therefore, is not to make a durable brick, but to supply the demand to make at as little cost as possible. Accordingly, the saving of manual labor and of fuel has been carried, not only by London brickmakers, but, to an extent, by all, to very great lengths. Of course, in the nature of the case, this mode of proceeding is very objectionable. It entails a much heavier expense upon the country than would occur were twice the price laid out upon the brick when they were first used and the houses built to stand a thousand years instead of a hundred. No doubt certain advantages attend these ephemeral structures. But the question the Englishman should ask himself, as should the American, where such conditions prevail, is, Does it pay in the long run? Under such a practice, it is true, the people are enabled to suit their houses once every century to the prevailing taste of the day, and, of course, neither in London nor in any other place, amidst such conditions, can there be any antiquated houses. The writer referred to above says, after investigation, that, "as the increase of the price of all the materials of building has more than kept pace with the increase of the wealth of the individuals, it is to be questioned whether the houses are always improved when they are pulled down and rebuilt." The writer knows of a very gorgeous house in an Ohio city erected on land leased for a certain period of time. It was literally thrown together, and the material used was mostly second rate. We ought to take a lesson from the expensive experience of our mother country.

Moderate Cost Tile Roofed Cottages.

The brick used in these houses are made in the local yards. The clayworking industry of England is the means by which tens of thousands of men earn their livelihood. In most rural yards where brickmaking is attempted to any extent at all modern machinery has been set up and experienced men have been employed. Good brick are available almost everywhere. The tiles, however, with which these houses are roofed are all imported from the large centers. The tile-roofed houses shown above are entirely out of the reach of common laborers. The rents of such houses are within the reach of mechanics and tradesmen only. The windows of this group are of antique style, the window sash being made of grooved strips of lead, which run diagonally across the frame and in opposite directions. Only very little of this work is seen nowadays, except in very old houses. I suppose the hedge which surrounds the garden was cheaper than brick, and the Englishman had time to wait for it to grow, so no doubt it was a great piece of economy to him.

Modern England alive. The bairns, the bicycle and the cottage. Truly modern are these. Neatness and beauty are aimed at, and in this group both obtained. These are called modern cottages, and yet I suppose that if an old-time cottager heard one calling them cottages he would say they were pretty high-bred ones. Well, they are. They are occupied mainly by railroad men, some of them owned by them, who receive good wages and are able to pay the rents. I need hardly call the attention to the chimney pots. It is an easy way of carrying the chimneys two or three feet higher. The brick of the fronts are a rich red color. When the walls were put up the mortar lines were whitened in some way, making the outlines of the brick conspicuous.

Speaking generally, I believe the American machinery and facilities for brickmaking are superior to the English. There are points of superiority, of course, in some English establishments, coming from longer and wider experience. The small yards in America are better equipped for work, while I think the English small yards are better manned. This little insight into the history of English brick building and making ought to have a lesson for us Americans. We are being driven to the use of brick more every year. Lumber is more expensive. The brick industry is growing. Brick are to be preferred, as they last longer than wood, and, in the end, are cheaper. A country yard owner told me last spring that he could not supply the demand for brick, and that he already had places for all he could make this summer. This is a good sign. We who believe in the superiority of brick ought to see to it that the prejudice against them in the rural districts is rooted out. The only way to do that is to encourage their use. I think statements occasionally of the cost of brick and frame houses and the superiority of the former over the latter would do good. The best way to plan and construct a brick house would help a great deal if published occasionally in our magazines. The old brick country houses are inconveniently arranged and often shapelessly built. We need to make ourselves known. The time is coming when country houses and a good many farm buildings will be of brick. We should build well. Buy the best brick. Build on freehold property, and do not be in too big a hurry to see the last brick laid and the scaffolding taken away. THOMAS JENKINS.

"DON'T TAKE WATER."

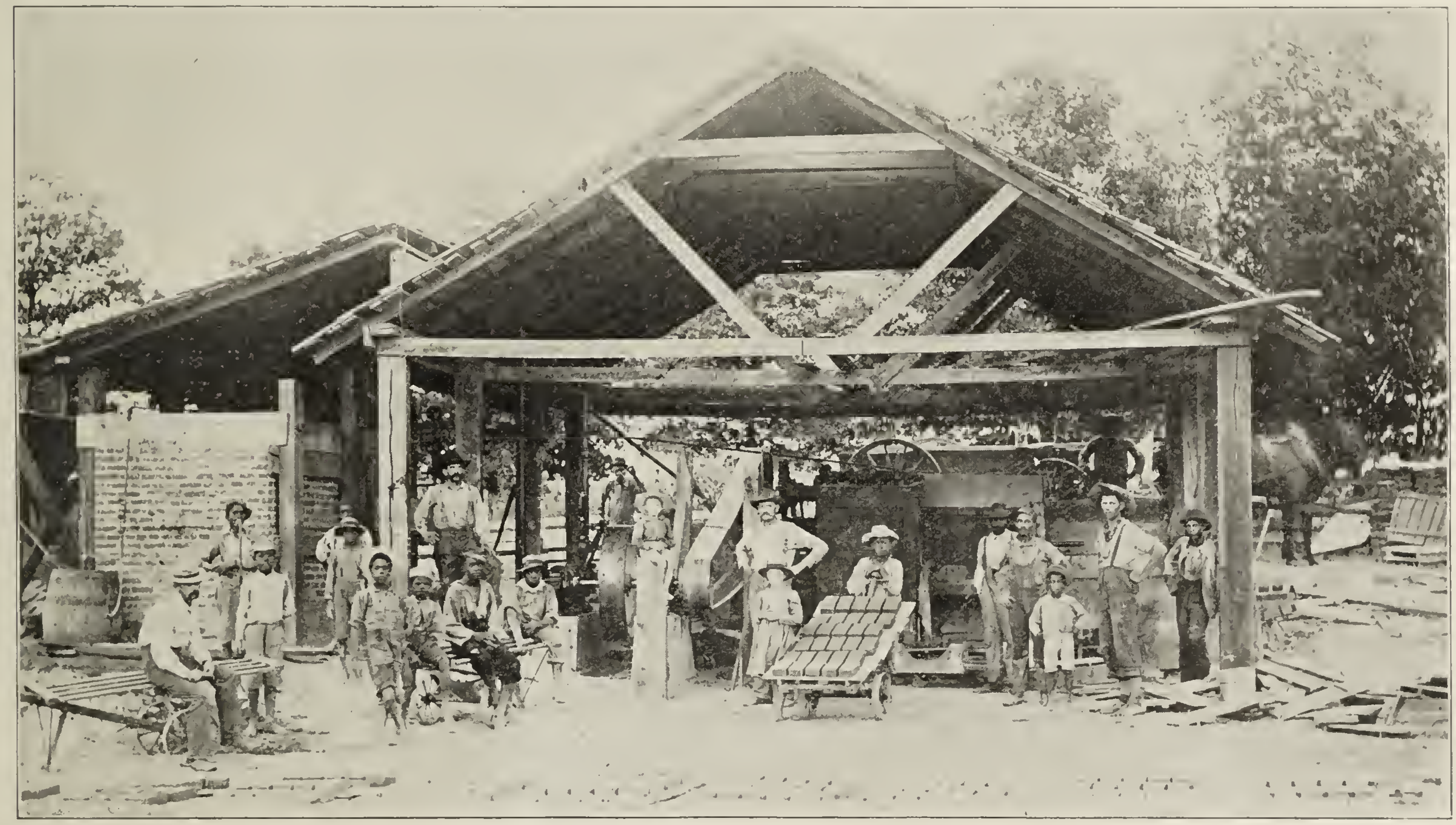
They were talking at the Metropolitan Club the other night about the hard fighting and hard drinking old generals of the American army in its early days, and some stories of old General Abercrombie, "who never tasted water," went around.

Modern English Homes of the Well-to-do Classes.

"My father," said one of the members, "once asked General Abercrombie why it was that he had such a natural distaste for water. 'I'll tell you of an incident that'll help to explain it,' was the frank old soldier's reply. 'A good many years ago I was crossing the great continental divide. It was colder than Greenland. In one of my saddle pockets I had a jug of whisky, and in the other a jug of water. Well, it was so cold that the jug of water froze up and busted. Supposing it had been inside of me!' "—Washington Post.

FROM SUNNY TENNESSEE.

MARTIN IS A live little Tennessee town of seven or eight thousand inhabitants, located some fifty miles south of Cairo, Ill., on the Illinois Central Railroad. One of its most important industries is the building brick plant of John G. Walters, to whom we are indebted for the accompanying photograph. Mr. Walters established the yard there some years ago, first making brick by hand. Being of a progressive disposition, he decided to try machinery, and put in a stiff mud outfit. His clay proved but poorly adapted to that process, and in 1896 he supplanted it with a soft mud outfit, consisting of a Quaker machine and Spiral Pug Mill working clay direct from bank This proved more to his liking, and he has continued its use ever since, making on an average of 25,000 brick per day. In 1898 he moved the old Quaker to Campbell, Mo., where it is still in operation, and in 1899 purchased a brand new Quaker from J. W. Hensley, of Indianapolis, and installed it in the place of the old one. Under date of the 6th inst. he writes Mr. H., saying that he has had a most successful season, having run his new Quaker from the beginning to the present time, without a single hitch or break down. To say that he likes the Quaker is putting it very mildly. He intends to add a new sander to the outfit the coming season, and thinks he will then have one of the very best common brick plants in his State. Should any brickmaker pay Mr. Walters a visit he will be accorded a welcome that will make him feel well paid for his trouble.



Jno. G. Walters' Brick Yard and Crew, Martin, Tenn.

A SATISFACTORY DEAL.

Inclosed please find my check for twenty dollars for advertising my brick machinery in The Clay-Worker as per our agreement.

I sold the machinery to Harmon & Judik, of Arlington, Md., for $600 cash, and have just received the money.

During the course of the advertisement I suppose I have received replies from half the States in the Union, and I hope you are as well satisfied as I am with the result of our arrangement.

With good wishes for the further success of The Clay-Worker, I am, yours truly, ROBERT WORSLEY.

Winchester, Va., Nov. 4, 1899.

Written for The Clay-Worker.

A BRICK FACTORY IN A WOODEN TOWN. No. 19.

BY L. C. M.

YOUR KILNS ARE no kilns at all, and there alone, I think, your loss exceeds the 15 per cent. mark. I have seen your men setting thousands of poorly burned bricks in a new kiln to be burned over. Add to these the broken brick and ragged arches and the total loss reaches a figure that would ruin any man's bank account. You need good kilns, but if you cannot afford to build them put up good walls and stop your constant casing up, daubing over and tearing down. This is error No. 3.

You pay 25 per cent. more per day for a man's wages than I do. I do not claim that low wages are a desirable thing, but when a man has to sell his goods upon the market and meet competition he surely should claim the same right when he goes to purchase labor.

I think my crew of men is superior to yours. Why is it necessary for you to pay so much higher wages? This is error No. 4.

About one month ago I passed your yard and saw that you had a large kiln all cased and daubed, ready to be fired, but there was not one cord of wood in sight. I do not know whose fault that was, nor why men bring me more wood than I can use, when you say that you are offering $1 more per cord than I do. If I refuse to buy a load because it is too trashy the woodmen all say that they can sell it to you. A short time since a driver brought a load of old rails to me by mistake.

I refused to purchase them. But he said they were already sold, and he had misunderstood his employer as to which yard. The figures he named that they were to receive was $1 more than I was giving for first-class wood. This is error No. 5.

You make your bricks nine inches long, and use that fact as an inducement to your customers to purchase your bricks. This is a source of loss to you in many ways, and seldom is considered by a purchaser as an inducement. It takes more clay to make them, more labor to handle and more fuel to burn them. Our brick make a wall 12 inches thick, which is the standard in this State.

Yours make a wall 14 inches thick. Thus it costs you about 16 2-3 per cent. more to furnish material for a wall than it does us. Cut your molds down to the standard size and you will sell just as many bricks and get the same price per thousand for them. This is error No. 6.

You are not a practical brickmaker yourself, and know very little about the details of their manufacture. You have to depend upon your foreman for the making and burning. In fact, almost the entire management of the yard is left to him, while you look after the sales and keep the accounts. This leaves you very little to do.

Your foreman is an old man, and learned all he knows of the business many years ago, when bricks sold at $7 to $9 per thousand at the yard, and plain walls were built at $10 per thousand. A man could then stand quite a percentage of loss and still make money. Your foreman does not realize that what was once called a profitable kiln would now be a clear loss. He thinks he does well if he produces bricks as cheap as he did thirty years ago, and does not hold himself responsible for the loss caused by the drop in prices. He is traveling in the same old groove, and is too old ever to pull himself out. This is error No. 7.

If you ever succeed you will have to learn the business yourself, put in long hours as your own foreman, look after every detail of the business in person, attend to the making by day and the burning by night, snatch a little rest between times by sleeping on the soft side of a board. Look after your men and lop off those that are constitutional loafers, and soon you will notice a decided improvement in your affairs. Take The Clay-Worker and read every line from cover to cover. Study the subjects of making, setting and burning. If, upon opening a kiln, you find 20 per cent. of them too soft to use, study out the reason of this failure, and see to it that it does not happen again. It may be that your burners went to sleep when they should have been up and doing.

It may have been the fault of the poor fuel you furnished, or perhaps the method of setting made it impossible to distribute the heat in a proper manner. One thing is certain, some one was at fault, and you should be able to find out where the blame lay or else quit the brick business.

I would not advise you to discharge your foreman unless you find out that your personal attention to the details of your business fails to bring matters to a more satisfactory issue, and that the services of a more competent man are indispensable to success in your work. He is a good molder and setter, and a useful man upon the yard. But above all things, take the management of the yard into your own hands and go to work in earnest.

Buy good fuel and keep plenty of it on hand. You say that you can borrow enough capital to do this, but you are afraid the interest will eat up the profits. But, my friend, waste will eat up more profits in a day than interest can eat in a year.

If you employ one more man on the yard than is necessary to do your work at $1.50 per day his wages for 200 days, which is the length of your season, will be $300. This alone will pay the interest on $5,000 at 6 per cent. for one year. You employ twelve men. Suppose they idle away ten minutes per day each, you have lost 120 minutes, or two hours labor for one man. This, at 15 cents per hour, makes 30 cents per day, or $60 per year. That equals the interest on $1,000 for one year. I will admit that interest is not always easily paid, but there are daily leaks that lose us ten times as much annually as the interest on all the capital necessary to run our business.

No, I cannot afford to raise the price of bricks now, however much I might desire to reap the benefits from such a course. At some future time I should be glad to meet all of the brick men in our territory, and agree upon prices that would make us all more money and enable us to pay better wages to all of our employes. But until we can make a general arrangement on prices, wages, etc., I shall plod along in the old way and strive by industry and economy to make ends meet at the close of the year.

POINTING BRICKWORK.

In finishing off the outside surfaces of brick walls the operation of pointing is often resorted to. This consists in filling up all the joints with superior mortar, and the better class of work with cement. To properly point a wall requires great care, and, indeed, some skill, where thorough neatness and finish in the joint are to be secured. Moreover, pointing requires to be conscientiously done, for much of the capability of a wall to resist the action of damp and of driving rains depends upon the way in which the joints are made good. The first operation of pointing is to remove all the mortar from the face of the wall which has been pressed out from between the brick in placing them in the bed; the mortar is next removed or raked out from between the joints with a tool made for the purpose, and for some distance inward, this being done in order to give a key bond or hold for the mortar or cement used in the pointing. As a rule all the brickwork intended to be pointed or tucked is laid first with ordinary common brick mortar, the bond properly made and the walls kept plumb, and before the mortar is set hard it must be raked out of the joints about half an inch deep. When there is not much ornamental work in brick on the face of the building the brickwork may be laid overhand—that is, the bricklayer may do his work from the inside of the building—and then tucked or pointed from a swinging scaffold. In common brickwork, where the brick used is of an inferior kind—that is, not pressed and of a uniform color—it may be necessary to stain the whole work, because some of the bricks are much darker than others, and give to the wall a mottled appearance when finished that is not at all pleasing. The first thing to be done in preparing for all kinds of tuck-pointing is the cleaning down or washing of the walls to be pointed, and clearing them of all mortar stains or dirt. This should be done with a solution of muriatic acid and water, making use of one pint of acid to each pail of water used. That the acid may not leave any damaging effects after it the work should also receive a cleansing of pure water immediately after the application of the solution. It is only necessary to clean as much of the wall at a time as can be easily reached by the workmen doing the pointing.

The next operation to be performed is the stopping. Red is composed of one part of fine putty lime to three parts of fine white sand, washed clean. This is colored with venetian red and Spanish brown, and made to suit in shade, as near as possible a brick color with the intended stain. There should be sufficient stopping made at one time to have the same shade as at first. It takes three hods of stopping to point two hundred feet of superficial brickwork. The stopping should be stayed with copperas, say one pound of copperas to every three hods of mortar or stopping, dissolved in hot water and incorporated when cold. The joints are then stopped or pointed in a rough manner, and no more should be done at a time than can be immediately finished by applying the putty joint before the stopping has become too hard. If this is not done the putty joint will not combine as it ought, and it will fall off in a very short time. When a sufficient amount is stopped in it is usual to rub it well with a piece of dry carpet or sacking, or something of the kind, and rub the stopping well into the pores of the brick, that the work may appear as uniform as possible. When this is properly performed the wall is ready for the color, which is composed of the same mineral points as the stopping. Ventian red and Spanish brown, one pound of each to one and a half gallons of water; and as these colors have no setting properties it is necessary to add about one pound of copperas to three gallons of stain, prepared in the same manner as for the stopping. Alum is also used in the same proportion; and sometimes a half gallon of stale beer to the same quantity of color of setting. Two ounces of red analine dissolved in alcohol will brighten up a barrel of color, if so desired. This is applied with a flat brush the usual way, after which the work is ready to receive the tuck joint, which may be rendered in either black or white joint of putty.—The Journal of Building.

BY THE LIGHT OF THE KILN FIRE

—Kiln Drafts.—

DID YOU EVER HEAR who the author of the slab poultice was? He was a way-down East farmer, whose knowledge of a brick kiln came from such close acquaintance as having time in his field adjoining a brickyard brought him.

One day in haying time he rested from his work of swinging a scythe and went over to the kiln to get a drink of water and help himself to a bite of chewing "tobacci," which may always be found laying about a burning kiln. The kiln had been on fire several days, and had cleared favorably in all but one spot. This cold spot, at first no bigger in circumference on top than a cart wheel, had bothered the burners. They had tried every method known to them to get heat into it. They had dug down deep into the top of the kiln, and had wasted many gallons of kerosene oil in the hole thus made in a futile attempt to bring the fire to the surface there. Their efforts in this direction were rewarded by the painful fact that the spot had grown preceptibly colder. Even the brick that were warm when first they were uncovered became cool, and the frigid zone spread on either side for many feet.

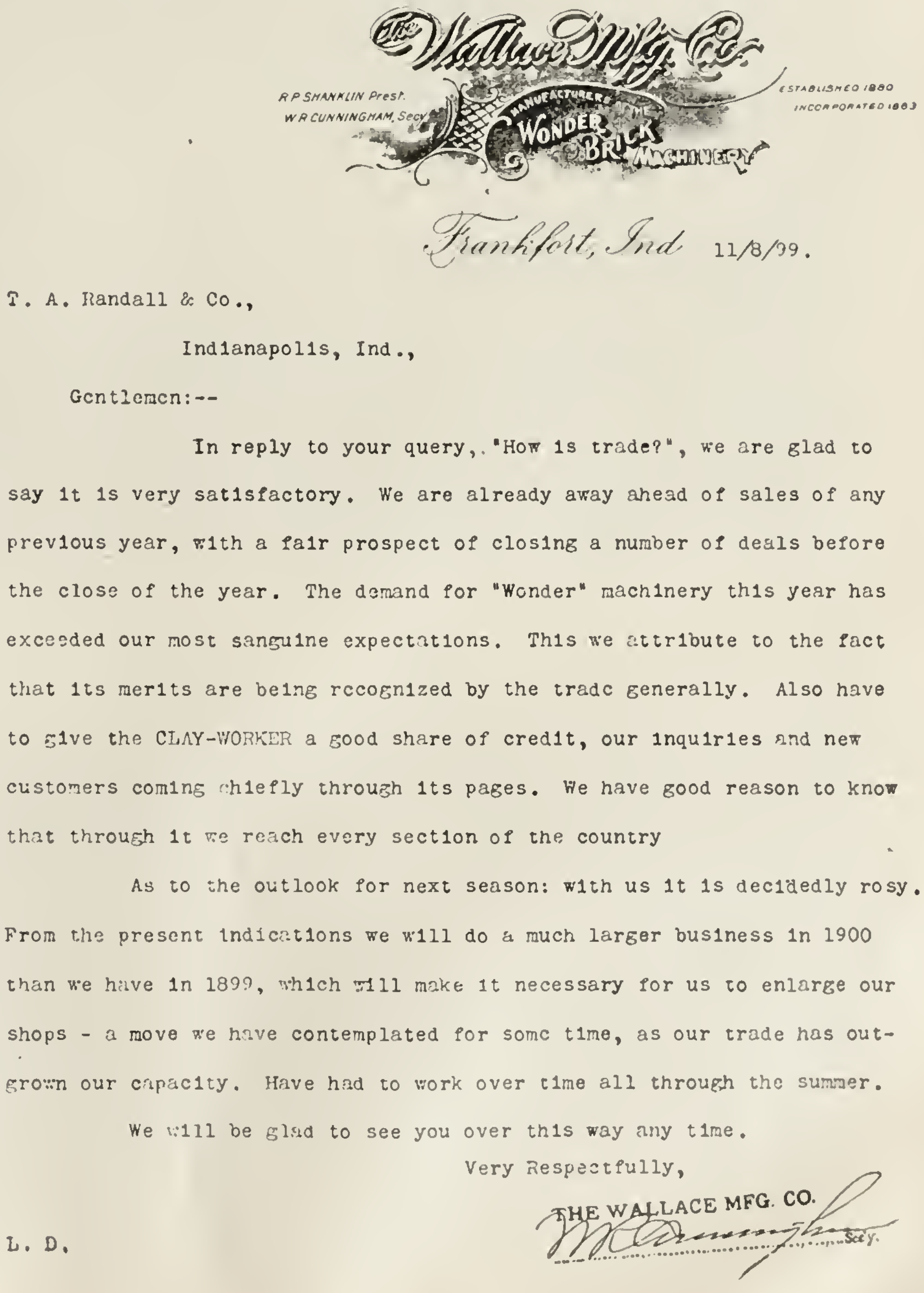
The old farmer was something of a student of nature, and of air currents he had a fund of alleged knowledge, gathered from the Lord only knows where. He knew nothing about brick kilns, but when he saw the antics of the puzzled burners he modestly approached the cold spot and placed his broad hand down upon the uncovered portion of the hole. Then he said to the burners: "Ef yew fellers got eny sense left ye'll kiver up that hole jest as quick as yew kin, and I'd advise yew to put all the brick back as thay ware before and then lay a floor of dry boards right all over it. Put yer hand down there and ye'll feel the cold draft running down into the kiln." They did so, and the fact was plainly marked. The farmer's advice was taken, and before many hours the cold spot had warmed up. The slab poultice caught fire, and when the kiln was opened the spot under the slab poultice was found to be the best burned portion in the kiln. Since then the slab poultice has been an unerring remedy for chills in kiln tops.

There are still many burners who scoff at the idea that there is down draft in old-style clamp kilns, but many burners who have been led to observe the nature and development of cold spots will swear that there is such a draft. Even when the kiln has cleared evenly, and when the fire is steaming through every space in its make-up, the down draft still goes on. At this stage, of course, the down current cannot be felt by the application of the palms, but in other ways it manifests itself. Any man who has ever burned a kiln, the top of which has been loosely set, will testify to the existence of the down draft or will express an inability to solve the mystery of the rapid disappearance of fuel in the center of the arches, let the mouths be held up ever so closely. We burned several kilns where the top had become loosened, and always found that the fuel rapidly wasted in the arches. Even when we sealed up both heads in the hope that we would thereby hold the heat in the body of the kiln we invariably found that a strong supply of oxygen had found its way into the arches and the big logs run in had been consumed. By taking a pickax and some soft brick to the kiln top and tightening the plattings we always had the satisfaction of seeing our "dressing" burn longer and our heat more uniformly maintained. There are men who, when accident or stress of weather compels them to abandon their kiln temporarily, run in a dressing and seal the arches up and return in 24 hours or later and find the kiln unharmed, as they say, but I'll wager with any of them that they find upon their return, if they noticed it, that the heat in the top courses of the kiln is greatly reduced.

It is an inflexible law of nature that warm air rises and cold air falls. Then as the hot air from the kiln mounts up is there not a vacuum caused in the place from which it is expelled. How can the vacuum be filled if not from the fire holes or the kiln top? I think that an observance of these simple facts would insure to puzzled burners sure solution of many of the problems that face them, the solution of which, as well as the cause, seems wrapped in mystery. THE DREAMER.

CREDIT TO WHOM CREDIT IS DUE.

Ofttimes advertisers are unable to determine the relative merits of different papers, for as a rule only a small percent of inquirers mention the name of the paper in which ad. is seen. Occasionally advertisements are inserted only in the CLAY-WORKER. When this is done the results always prove its great value as trade getter. The accompanying letter is an illustration—The Wallace M'f'g Co. virtually confined their advertising the past year to our columns. That they have obtained their full share of trade favors is very gratifying. Just the same they and other advertisers as well, will esteem it a favor if those who write for Catalogues, etc., will mention the CLAY-WORKRR.



The Wallace M'f'g Co.
R P SHANKLIN Presᵗ.
W R CUNNINGHAM, Secy.
MANUFACTURERS THE WONDER BRICK MACHINERY
ESTABLISHED 1880
INCORPORATED 1883

Frankfort, Ind 11/8/99.

T. A. Randall & Co.,

Indianapolis, Ind.,

Gentlemen:--

In reply to your query, "How is trade?", we are glad to say it is very satisfactory. We are already away ahead of sales of any previous year, with a fair prospect of closing a number of deals before the close of the year. The demand for "Wonder" machinery this year has exceeded our most sanguine expectations. This we attribute to the fact that its merits are being recognized by the trade generally. Also have to give the CLAY-WORKER a good share of credit, our inquiries and new customers coming chiefly through its pages. We have good reason to know that through it we reach every section of the country

As to the outlook for next season: with us it is decidedly rosy. From the present indications we will do a much larger business in 1900 than we have in 1899, which will make it necessary for us to enlarge our shops - a move we have contemplated for some time, as our trade has outgrown our capacity. Have had to work over time all through the summer.

We will be glad to see you over this way any time.

Very Respectfully,

THE WALLACE MFG. CO.
W R Cunningham Secy.

L. D.

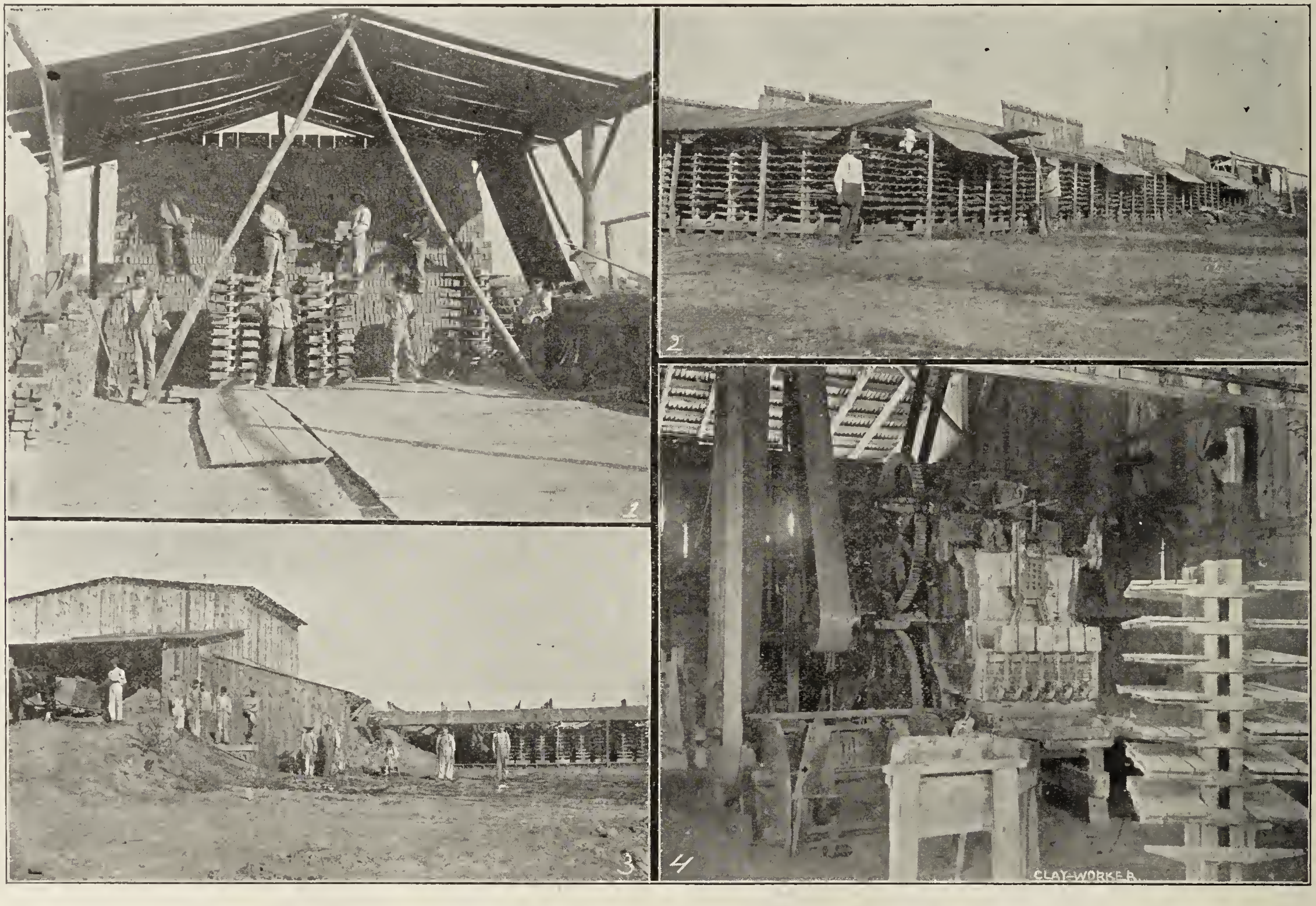
Written for The Clay-Worker.

INDIANA'S BRICKYARD.

AT FORT WAYNE, the third city in the State, is located the School for Feeble Minded Youth, an institution much more extensive than is generally understood. Here several hundred feeble minded children of both sexes are cared for and educated as well as their limited abilities will permit. As many of the inmates have but little mental strength, their education must, in the nature of things, be of a primary character. It is no small task to teach them to read and write and perform light household duties. Common labor, such as garden work, the planting and harvesting of farm products, care of the stock needed for such an institution, has for some years past been performed by the inmates under the direction of competent and willing assistants. From a small beginning in this direction the work has progressed until now nearly all the clothing and shoes worn by the inmates are made by them. The present superintendent, Mr. Alexander Johnson, is the right man in the right place. Having remarkable executive ability, he is so directing the work of education that many of the poor unfortunates who have heretofore been almost helpless are now well-nigh self-supporting.

The latest and perhaps the most useful development of industrial pursuits is the making of brick for the new buildings which must be provided to meet the needs of the constantly increasing number of inmates. Believing that his boys could be depended on to do the major part of the work, Mr. Johnson in the spring of 1897 bought a cheap second-hand brick machine, and secured the services of an experienced brickmaker, who, with ten of the middle or upper grade of feeble minded boys, proceeded to make brick, and turned out the first season 250,000 good merchantable brick, at an average cost of $1.25 per thousand. The institution embraces a large acreage of farm and timber land. From the latter the boys gathered during the winter enough wood for burning the brick, so there was no expense for fuel. The cost of the brick mentioned consisted chiefly of the superintendent's salary. From the first the boys took kindly to the work, which seems to be an aid to their development mentally and physically.

The second year with the same force they made 394,000 brick, the average cost to the institution being reduced to $1.11 a thousand. The work was proving so satisfactory that Superintendent Johnson determined to obtain a more modern equipment, and, after visiting several plants in the gas belt, decided that the Mock system was the best adapted to his needs, as by that process the brick are handled easily and with but comparatively little manual labor. He accordingly replaced the old machine with a new all-iron Mock force feed double press molding machine, and installed it, with a corrugated stone separator and crusher and mold sanding machine, in a substantial machine house. Water is obtained from a deep well, and the entire equipment operated by a 20-horse-power gasoline engine.



1. Setting brick in Kiln. 2. View of a corner of the drying shed, one of the boys in the act of raising one the Sectional Roof Leaves. 3. The Machine house. 4· The Mock Machine.

The clay is gathered from a field near by and hauled in cars by horse power up a slight incline and dumped into the crusher. From the machine the brick are placed on pallets and placed on movable tracks, each holding eighteen pallets. When filled they are picked up, rack and all, and wheeled to the drying sheds. When ready for the kiln the same truck is again brought into use, and they are trucked to the kiln. The brick are not handled at all until they are tossed from the pallet to the setter. The truck is so constructed that any average boy can handle it, loaded or empty, with but little effort. Both Mr. Johnson and his superintendent, Mr. Leonard, are

INDIANA'S BRICKYARD—1. Hauling in a load of Clay. 2. A Graduate and an Empty Pallet Rack.

thoroughly convinced that this is the easiest and best way of handling soft mud brick.

As the accompanying views indicate, the plant is very compact and conveniently arranged. It was built from plans prepared by Mr. Jas. F. Mock, of the firm of Jas. F. Mock & Co., Hartford City, Ind., whose ad. appears on page 492 of this magazine. Mr. Mock is a practical brickmaker, as well as a designer and builder of brick machinery, hence a good adviser in such matters.

Superintendent Johnson is quite proud of his brickyard. He argues that even if the bricks made cost the State as much as it costs to buy them from a regular brickyard the investment would still be a good one, since it gives employment to the low-grade imbeciles and idiots, which is essential to their own welfare. By these methods these persons are made entirely self-supporting, and they are happy. They appreciate the fact that they belong to the brickyard gang, a fact of which they are proud, and which is a matter of distinction among their fellows.

When all the buildings that are needed for the institution have been constructed Mr. Johnson proposes to turn his attention to the making of brick for the public highway. There is little doubt but that in that way he can render still more valuable service to the State, and perhaps inaugurate a movement that will revolutionize the use of convict labor. It is a work well worthy of all encouragement.

THE BERG PRESS SAID TO BE AN INFRINGEMENT.

A suit for infringement has been brought in the United States Court, in the district of Indiana, against the Anderson Foundry and Machine Works et al., of Anderson, Ind., the present manufacturers of the Berg press, by the Chisholm, Boyd & White Company, of Chicago, Ill., the manufacturers of the Boyd brick press. The bill in equity was filed at Indianapolis Nov. 28, 1899, in which infringement is claimed of the United States letters patent Nos. 429296, 455374 and 488622, all of which are owned by the Chisholm, Boyd & White Company.

Written for The Clay-Worker.

FIRE BRICK: THEIR MANUFACTURE AND USES. No. 5.

BY ALFRED CROSSLEY.

THE SECOND important element in fire clay is alumina. This, as is well known now, is the ore of a valuable metal that has created a great stir in the industrial world during the last few years, and at one time was predicted to replace iron and steel to a large extent at an early date, and the only bar to which seems to have been its cost of production. This must be regarded as the most valuable element in the clay so far as its refractory quality is concerned, for it may, indeed, be said to be absolutely infusible, and, what is more, does not readily combine with other elements to render it fusible, and is but little affected by their presence. As already stated, it exists in combination with the silica and water, and is then a hydrous alumina silicate, or clay. Pure alumina has the disadvantage of extreme contractibility, even to a greater or less extent overcoming the opposite tendency in silica when combined with it, and hence most clays contract more or less. On account of its pre-eminently refractory properties it has to some extent been used for crucibles, but to counteract the excessive contraction previously burnt alumina was mixed with it. The proportion of alumina in fire clays is variable; those containing the largest percentage are the most valuable, producing the most refractory brick. It ranges from 12 to 40 per cent., usually being about 30 to 35 per cent.

Iron, in the form of ferric or ferrous oxides thereof, and of iron pyrites or sulphide of iron, is present to a greater or

The Mock System of Handling Brick. 1. An Inmate trucking a Rack load of Brick from Dryer Shed to Kiln. 2. Mr. J. F. Mock inspecting a Rack of Green Brick. 3. Inmate Handling a Rack and Empty Pallets.

less extent in nearly all fire clays. It may range as high as 6 or 7 per cent., if the clay be highly aluminous, with little or no free silica, without destroying its refractory quality. Usually, however, owing to the presence of free silica in quantity, 3 or 4 per cent. of oxide of iron will render a clay fusible, and such is its fluxing effect, when aided by other impurities, that if alkalies be present to the extent of 1 per cent., then even 2 per cent. of iron will seriously impair the quality of the clay. Two or three per cent. of iron oxide is said to render most clays useless at the temperature of the Semens steel melting furnace. Any quantity not exceeding 1 per cent. may be regarded as practically harmless.

Lime and magnesia are both hurtful in fire clay, as either of them will combine with the free silica to form, when again combined with the silicate of alumina, a readily fusible double silicate. Lime is more injurious than magnesia, which latter is not so much to be feared, except that in either case the fluxing properties of the one are disproportionately increased by the presence of the other in even a small quantity.

The alkalies, potash and soda, are extremely hurtful to fire clay. Either of these, united with free silica, forms a true glass. These should not exceed, in good fire clay, more than 0.2 to 0.5 per cent., while if they reach as high as 1 per cent. or upward they materially impair its refractory character, especially if oxide of iron be present in sensible amount. Dr. Percy says, however, that in the proportion in which the alkalies appear to exist in some of the best fire clays their effect may possibly be beneficial rather than otherwise, by soldering the particles firmly together. He also says in regard to lime that a small quantity uniformly diffused through the fire clay may not be injurious, and possibly tends to render the substance of a crucible made of such clay compact and close in grain.

Titanic acid, which is sometimes given in an analysis of clays, and which, it is said by Dr. Percy, may be found in nearly all fire clays, has been, on the one hand, said to be injurious, and, on the other, beneficial; but I have not found any conclusive evidence that it exerts any special influence either way. A blast furnace manager on one occasion remarked to me that he had found titanic acid in a certain fire brick, and attributed the excellence of the brick in question partly to it, on the ground, as he said, that it was indestructible by heat, and that therefore it must help the brick. This argument, however, is entirely fallacious. It is a very common error to suppose that two or more very refractory elements united together must make a still more refractory whole. The fact is that the contrary is very often the case. For instance, lime and magnesia are both highly refractory, and, in fact, have both been used for the production of both crucibles and fire brick (reference to which will be made in the proper place), and yet either of these in a fire clay, and more especially if both are present together, has a very strong tendency to render the clay fusible.

The celebrated French chemist, Berthier, conducted an elaborate series of experiments as to the fusibility of silica with various other substances. From these and experiments made by others the following conclusions have been drawn in regard to the elements usually contained in fire clay:

The fluxing effect of these on the clay are in the following order, beginning with the highest: Soda, potash, oxide of iron, lime and magnesia. Weight for weight, soda fluxes more than potash. A mixture of potash and soda is more fluxing than either alkali separately. The alkaline silicates always give great fusibility to the compounds which they form with other silicates.

No silicate of alumina (pure clay) is completely fusible at the highest temperature attained in furnaces—that is, such as were in use when Berthier wrote—but some of them soften, and all become more or less strongly agglomerated. The two silicates of alumina of the following composition appeared to soften most of all:

Silica	64.3	Silica	73.0
Alumina	35.7	Alumina	27.0

Their tendency to fuse may be diminished by the addition either of silica or alumina. Protoxide of iron produces a remarkably fusible double silicate.

With respect to double and multiple silicates, their fusibility depends on that of the component silicates. A silicate which is infusible per se may always be melted by combining with it a proper quantity of a fusible silicate, and, further, even many infusible or difficultly fusible silicates may, in combining with each other, form very fusible double silicates.

For example, silicate of lime and magnesia, of lime and alumina, etc.

A clay of whatever kind always melts into glass when heated to 150 degrees P. (about 5,000 degrees Cent.), with half its weight of potash or soda.

Lime, which forms infusible or very difficultly fusible compounds with silica alone, may produce, with a great number of infusible or slightly fusible silicates, compounds which melt easily. Magnesia may, like lime, cause the fusion of the silicates of alumina, but it is much less fluxing.

Any clay whatsoever may, by the addition of half to three-quarters of its own weight of carbonate of lime, be rendered sufficiently fusible to allow shots of metal to sink through the mass and collect into a button at the bottom.

I have introduced the preceding extracts (abbreviated as much as possible) because they are the result of very careful experiments and are both interesting and instructive. I have thus endeavored to show that the injurious effect of the various fluxes is more especially through the medium of the free silica, and only affect the alumina indirectly. This appears to be clearly proved, as regards the oxide of iron, in the case of bauxite. This is a mineral occupying a position between iron ore and clay. Its composition shows a high percentage of alumina, a very little silica—sometimes as low as 2 per cent.—with about 20 per cent. of oxide of iron. Yet with this large percentage of iron, a highly refractory brick is made of it, very much more so than ordinary silicious clays containing not more than 3 or 4 per cent. of iron. Of this substance and its manufacture into fire brick I will have more to say hereafter.

The following shows the variation in composition of different fire clays:

Silica	42 to 79 per cent.
Alumina	12 to 43 per cent.
Oxide of iron	None, or trace, to near 8 per cent.
Lime	None, or trace, to 5 per cent.
Magnesia	None, or trace, to near 5 per cent.
Alkalies (potash and soda)	None, or trace, to near 3 per cent.
Water (and loss)	1 to 22 per cent.

It is possible that some of these extremes may be errors, but they are taken from published tables, and the figures are taken of such clays only as are known to have been in actual use as fire clays.

At the risk of repetition, I would again call attention to the fact that a combination of impurities disproportionately increases the fusibility of any clay, so that, for instance, a total aggregate of only 1 per cent., divided among the five chief fluxing elements, is much more hurtful than even 2 or 3 per cent. of one kind only, with an entire absence of the rest. It is no doubt true that many first-class fire clays show by analysis a large percentage of some of the impurities, but it still remains true also that, on principle, the less a clay contains of them the better it is likely to be. The cold logic of facts sometimes appears to be in contradiction of the chemical teachings on this subject, but it should not be forgotten that the refractoriness of a clay is affected by other conditions besides its chemical composition, and some of these we may now consider.

(To be continued.)

THE ILLINOIS CONVENTION.

The Twenty-Second Annual Meeting to be Held at Ottawa, January 9 and 10, 1900—Points of Interest to those who will Attend the Convention.

The coming Annual Convention of the Illinois Clayworkers' Association promises to be one of the best in the history of that successful organization. The Secretary has prepared an inviting array of papers and subjects for discussion, as will be seen by the following

PROGRAMME.

—Tuesday, Jan. 9, 9 a. m.—

Enrolling members, and reports.
Appointing committee on resolutions.
Report of committees.

—Tuesday Afternoon Session.—

Address of Welcome....Hon. M. T. Moloney, Mayor of Ottawa
Annual Address.............President H. F. Townsend, Avon
"How to Curtail the Fuel Expense"....John Maddigan, Peoria
"Continuous Kilns".......................E. J. Hess, Ottawa
"Lessons of the Hard Times"......T. P. Plumridge, St. Louis
"Tile Laying in a Drainage District"....J. R. Martin, Arthur
"Our Exhibit".................Dr. A. L. Converse, Springfield
Discussion—"Grates vs. No Grates"..Led by W. S. Purington, Galesburg
"How to Figure Cost of Ware"...........R. McShane, Lostant
"From Clay Bank to Kiln"...............A. Thomas, Roselle
Adjournment.

—Tuesday Evening.—

Banquet, given by the clayworkers of Ottawa....................Dr. A. L. Converse, of Springfield, Toastmaster

—Wednesday Forenoon, Jan. 10.—

"The Future Tile Business".............J. M. Mamer, Campus
"Capital vs. Labor"...................D. Melcher, Monmouth
"Biography of an Old Clay Bank."
"Building Blocks"..............O. T. Denison, Mason City, Ia.
Discussion—"How to Maintain Efficient Laborers"...F. Plumb, Streator
"The Outlook for New Beginners"..E. M. Heafer, Bloomington
"Preparing Clays"...........Geo. F. C. Doelle, East St. Louis
"Why Burned Clay Is Superior to Other Materials".....................................Geo. Gillen, Cantrall
Questions Asked.
Report of Treasurer.....................Wm. Stare, Mendota
Report of Committee on Resolutions.
Election of Officers.

Wednesday afternoon the Convention will be in charge of the Committee on Arrangements, and will visit the various clayworking plants.

Good accommodations have been secured at the Clifton Hotel, which has been selected as headquarters.

H. F. TOWNSEND, President, Avon, Ill.
G. C. STOLL, Secretary, Wheaton, Ill.

The Association will not only be received by a committee of local clay manufacturers, but will be the special guests of the Ottawa Development Association, which will spare no pains or means to make the visiting clay men happy during their stay in Ottawa.

The Ottawa Development Association, composed of two hundred business men, has done wonderful things. It has not only located the great Sieberling plant and raised nearly $200,000 in the past year, but has established several other factories, and has more in sight. Its president, Al F. Schoch, is one of the marked and noted young men of northern Illinois. His executive, financial and municipal abilities have been very highly recognized. As Mayor of Ottawa he made an extraordinary reputation for his improvements and grasp of affairs. He is vice president and manager of the National City Bank, an institution with $1,000,000 deposits, and also a member of the Illinois State Drainage Commission. Mr. Geo. M. Trimble, the secretary, is a man of incomparable fitness for the place, of marked ability and splendid loyalty to the town and its best interests.

Hon. Maurice T. Moloney, Mayor, Ottawa, Ill.

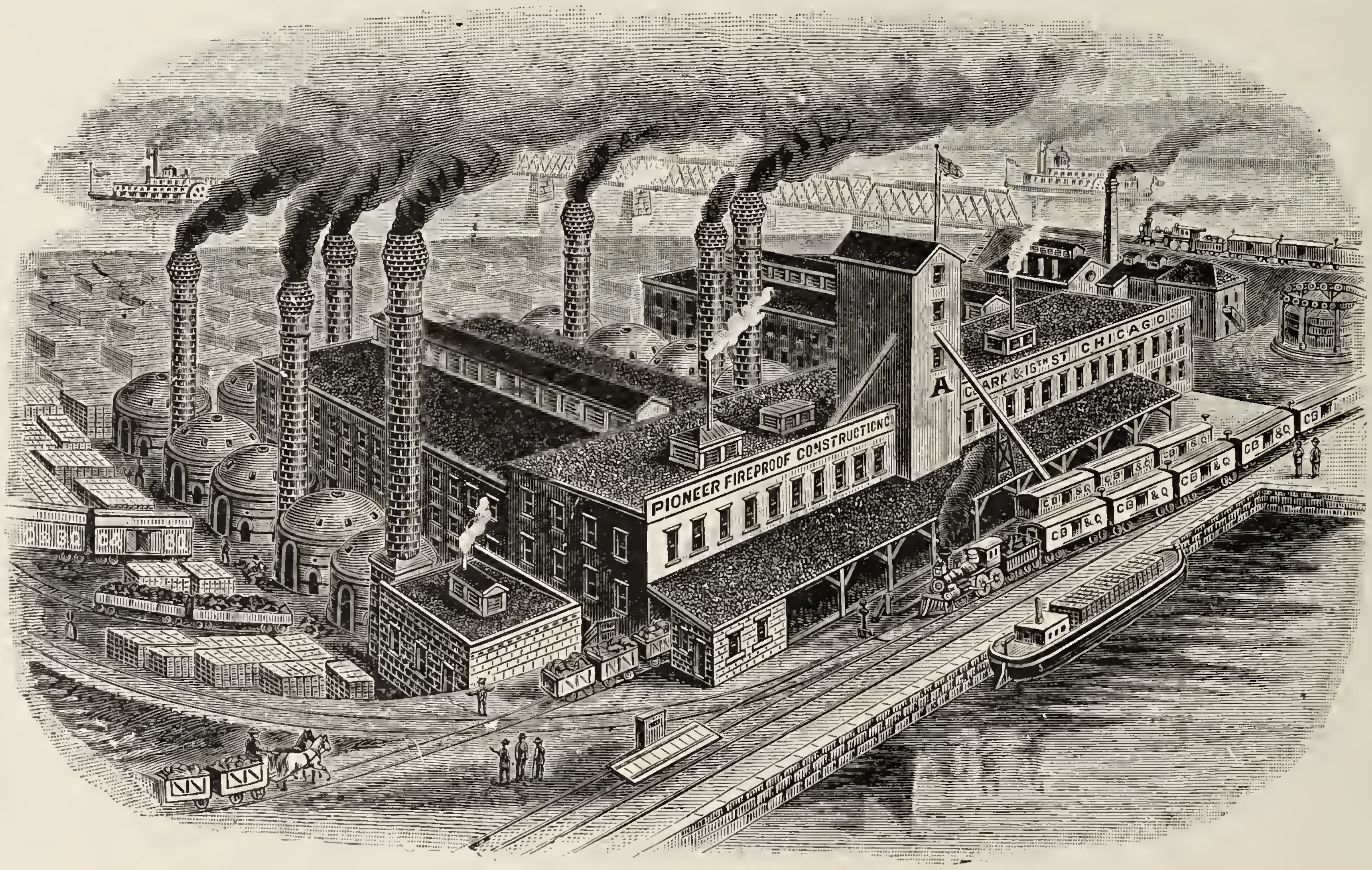
Mayor Maurice T. Moloney is one of the well-known men of the State. His fight with the trusts when he was Attorney General of Illinois established his reputation in many States. He is thoroughly identified with all Ottawa's steps toward material growth and enterprise, and is now making the gas plant, of which he is owner, one of the most modern and best in Illinois. He was elected by the people, in a great measure, without party distinction, as a progressive leader for the manufacturing and industrial interests of the city.

Ottawa is just now attracting much attention in Illinois and

Standard Fire Brick Co., Ottawa, Ill. Dayton factory.

adjacent States. With a population of less than 15,000, this old town raised by public subscription, for the purpose of locating the Sieberling Plate Glass Company at Ottawa, $165,000. This was done in less than thirty days. Previously, during the same year, the sums of $15,000, $6,000, $5,000, $5,000, $6,000 and $300 had been subscribed for public enterprises. To the Sieberling fund there were 1,267 subscribers. The largest subscription was $6,000 and the smallest $50. On the first payment of 25 per cent. there was a shortage in collections of less than 4 per cent. Already buildings which will cover ten and a half acres of ground are in progress of erection. It will take until next fall to complete the plant of one of the largest plate glass works in the world.

Among the attractions recently added is the Duke Forson camp meetings. Duke Forson, the millionaire broker-Methodist evangelist, has purchased Buffalo Rock, a noted historical and scenic spot of the State, west of the city limits, and will bring the most celebrated and eloquent divines and evangelists of the day to assist him in making his meetings rival those of Lake Bluff, the Methodist resort of Chicago.



Plant A of the Pioneer Fire-Proof Construction Co., Ottawa, Ill.

Ottawa is a noted clay center. La Salle county, of which it is the seat of government, is very rich in clays. There is not only a large variety, but the deposits are so extensive as to be inexhaustible. With such a wealth of raw material it is little wonder that there are a number of large brick and tile plants in the vicinity. One of the largest of them is

—The Standard Fire Brick Company.—

This company has two large factories, one at Brickton, a suburb of Ottawa, and the other at Dayton, a neighboring town. The head office of the company is at Ottawa, with a branch office at 153 and 155 La Salle street, Chicago. The officers who direct the enterprise are:

President and Treasurer—Thomas D. Catlin.
Vice President—M. W. Bach.
Secretary—E. W. Bach.
Manager Chicago Office—D. T. Lorriaux.

In November, 1895, the company was organized, with a capital of $25,000, and bought the Dayton property.

Shortly after the Standard Fire Brick Company had been legally organized and had commenced business, negotiations were entered into with the firm of Hess, Crotty & Williams for the purchase of their brick factory, located about a mile east of Ottawa, at Brickton. The capital stock of the Standard Fire Brick Company was increased to $50,000, and the purchase of the plant of Hess, Crotty & Williams effected, and the company assumed control in May, 1896, with the same set of officers that the original Standard Fire Brick Company had, each private individual of the old firm of Hess, Crotty & Williams taking an interest in the company which purchased their plant.

The Dayton plant is situated four miles north of Ottawa, on the Fox River branch of the Chicago, Burlington & Quincy Railroad system, and has its own sidetrack along the yards, and the Ottawa factory is located on the Chicago, Rock Island & Pacific main line, with a sidetrack at the factory also. Thus the company has double the shipping facilities that any concern located on a single system would have, saving, of course, a great deal of annoyance and the expense caused by transferring from one road to the other. The company is a member of the Western Railway Weighing Association, from which a great benefit is derived.

At the Dayton factory the company has abundant water power, and at Ottawa steam power is used. Both places are heated thoroughly by a complete system of steam pipes, and they are also amply equipped with the usual dry pans, pug mills, clay crushers, conveyors, hand and power presses, clay bins and auger machines, no steam presses being used in the manufacture of their wares.

Fire brick and fire-clay articles are the company's main product. The market for this material is, besides Chicago, the great trade center of the West, all of the northern part of Illinois, Iowa, Wisconsin, Minnesota and Michigan, all of them great manufacturing States. Their competitors in the fire-clay materials are very few, while the competitors in the common clay products are many, nearly every location of any size at all having its own common-brick yard.

Fire clay is the material out of which they manufacture their most important products. The upper stratum of common clay and coal is removed and the beds of fire clay exposed, they being from six to ten feet in depth. The clay is then blasted out in large quantities, and conveyed to the dry pan and ground very fine and run over screens, and often shipped in this state to be used as mortar in laying up brick used for refractory purposes. In making brick, after being ground fine it is run through pug mills and then auger machines, and here it comes forth in streams of varying size, depending on the dies used, and cut off by wires into the size and shape desired, except very large or special shapes, which have to be hand-molded or hand-pressed.

They can well be proud of the reputation their brick have attained in Chicago and the Northwest, which is unparalleled by any of their competitors. They supply material for stack linings, boiler settings, iron cupolas, furnaces, foundries, lime and brick kilns, retorts, and any purpose requiring refractory brick. The beds of plastic fire clay at Brickton, and also to a limited extent at Dayton, have not been touched in recent years, although they are very valuable deposits, as they are adapted for the manufacture of stoneware and articles of that kind.

THE PIONEER FIREPROOF CONSTRUCTION CO.

This company is among the best known clay manufacturing concerns in the United States. They have two immense factories in Ottawa which annually turn out 50,000 tons of fireproofing and a goodly quantity of fire brick, etc. They give employment to an army of workmen and have furnished the covering for the steel structures of many of the sky scrapers of Chicago and other large cities. The company was established in 1885, and has been in successful operation ever since. Its officers at present are Col. George M. Moulton, president; Charles F. Eiker, treasurer and general manager, and W. A. Moulton, secretary. The clay banks from which they draw their supply of raw material are located nearly two miles from the works, and are connected by a private trolley line. The clay is hauled in cars holding three tons each. Ten to fifteen of these cars are taken back and forth at a time.

The factories are located a short distance apart and are equipped with every modern device for carrying on the work. A visit to this plant will of itself pay for the trip to the Convention.

—The Celladon Terra Cotta Co., Ltd.,—

Is another establishment which visiting clayworkers will find it worth their while to inspect. The eastern works of this company, at Alfred, N. Y., were recently totally destroyed by fire, as has been told in the columns of The Clay-Worker. This their western plant, is consequently now crowded with orders. They manufacture a large variety of roofing tiles, which are burned in down-draft and continuous kilns. The ware is made of shale which burns a beautiful dark red. No handsomer or more durable roof can be placed upon a building than is made of these Celladon tile. That they are growing in public favor is indicated by the constantly increasing demand, which comes from far-away Boston in the East, Denver and Helena in the West, and New Orleans and Port Arthur, Tex., in the South. And there is scarcely a city of any consequence between these points where these tile may not be seen in use. The company has offices in New York and Chicago. Charles T. Harris, the genial president of the company, is usually to be found at the former, while Henry S. Harris, vice president, and E. J. Hess, assistant secretary and treasurer, hold down the western end of the line at Chicago. We understand that this and the other plants named will be in operation the week of the Convention, and that delegates will be invited to visit them.

Another Ottawa enterprise which all the visitors will be sure to patronize and appreciate is the Daily Republican Times, an up-to-date newspaper, which not only gives all the news all the time, but occasionally gets out special industrial issues depicting the great industrial interests of Ottawa, and it is to one of these issues that we are indebted for the accompanying illustrations.

Works of the Celladon Terra Cotta Co., Ltd., Ottawa, Ill.

Staying Qualities.

A horse which is successful as a racer usually possesses good "staying qualities," that is, ability to stick it out till the end, no matter how long that may be. This quality is what counts in a merchant; he must have the faculty of staying with a good thing till he makes other people see and realize that it is good. To advertise intermittently is as unsatisfactory for the merchant as it would be for the race horse to "break" occasionally on the course.—Stoves and Hardware Reporter.

Written for The Clay-Worker.

MODERN AMERICAN FRONT BRICK. No. 23.

POROSITY IS one of the most important factors to be considered in connection with the manufacture of clay wares, one which deserves the careful consideration of all, especially of those connected with the production of the higher grade building products. The difficulty experienced in producing straight and true ware is a problem which always confronts us. For instance, in the manufacture of floor tiles, in which resistance to wear is the greatest desideratum, the question of porosity must be carefully considered. Again, where impervious surfaces are desired porosity is a factor of extreme importance. Numerous examples could be cited in which this topic finds practical application.

Porosity is the ratio between the volume of the solid matter of a substance and the volume of its pore space. From this definition it appears that the term may be used to express the numerical value of the density of a body. For instance, a body of 100 volumes, containing five volumes of pore space, has a porosity of 5 per cent., and this may be used as an expression for density which obviously is the inverse of porosity. To say that one body has a porosity of 5 and another of 10 per cent. evidently means that the former is denser than the latter.

From what we know by this time of the composition of clays, plasticity and the effect of water, we can readily say that the degree of porosity depends upon the mineral structure, the size of the grains and the amount of pore water, to which must be added the kind of molding and the degree of burning. Let us take up these points in the order named.

It is not difficult to see that the physical make up of a clay is of vital importance in this respect. A body made up of a large percentage of quartz grains held together by just enough clay substance to form a weak bond must certainly show a greater porosity than one higher in clay substance and lower in quartz, simply because the quartz grains being, as a rule, larger than the particles of clay substance and irregular in outline give rise to a large volume of pore space. Since we may say the larger the amount of quartz present the greater will be the porosity, provided the grains of nonplastic matter are not extremely fine.

If the quartz has been ground to such an extent, either by nature or artificially, that its grains do not exceed those of the clay substance in size the porosity will be diminished, and hence a greater density will be the result. This is due to the nonplastic character of the hard mineral particles, and is in accordance with the practical result obtained by the fine grinding of clays. For instance, in the manufacture of vitrified floor tiles the grinding is carried quite far. In brief, we may say that in general all clays which have undergone the most intense natural grinding and carrying the least quantities of comparatively coarser grained mineral matter as feldspar, quartz and mica, will produce the densest bodies.

Experiments have been made to prove this fact by pressing briquets from finely ground primary kaolin and plastic fire clays, with varying additions of feldspair and quartz. The primary kaolins, as we know, contain residual mineral matter of varying degrees of fineness, while plastic fire clays have undergone a thorough natural grinding process. The briquets were pressed under exactly the same conditions, the quartz and feldspar added, having been ground to an impalpable powder. It was found that the plastic clay gave rise to denser bodies than the kaolin, the difference varying from 7 to 12 per cent.

We must, however, not forget that a body may be dense when green and yet porous after burning. Such is the case in the presence of carbonate of lime and carbon in its several forms. The former shrinks in volume in burning, the latter burns out, so that in each case the porosity is greater after burning unless carried to vitrification. The application of this in the manufacture of filters and terra cotta lumber is too well known to need consideration here.

—The Effect of Pressing.—

When clay is made up with water the shrinkage evidently is a function of the amount of water used; the more water the clay contains the greater will be the shrinkage. But the final porosity of the dried ware depends upon the quantity of pore water; that is, the water occupying the space between the particles when they are in contact, so that on completed drying the water is expelled and the empty pores are left. But the volume of pore space evidently is again and fundamentally dependent upon the amount and character of the nonplastic matter, size of grain and mode of molding. The latter is a factor which is of great practical importance. Porosity, neglecting the degree of grinding and make up of the clay is principally a function of the amount of water used in molding and the pressure applied. A hand molded brick after drying obviously must contain a larger amount of pore space than an auger machine brick, since in the making of the latter less water is used and a greater pressure applied, which tends to wedge the particles together more intimately.

Knowing that the amount of water present governs the degree of shrinkage, and reasoning, that if no water is present to fill the pores between the clay particles, the latter could be made to form a body which shows no shrinkage and but little porosity by pressing the finely ground, perfectly dry clay under great pressure. This would seem an easy solution of the floor tile problem. But, as a matter of fact, this is not true. Aside from the difficulty of pressing dry clay powder a brick thus obtained will invariably be found to be more porous than the hand molded product.

Prof. Seger (Ges. Schriften, page 313) has shown this in a set of experiments made by him, in which he determined the relative porosity of briquets pressed from dry and damp clay as well as of such molded by hand and repressed. The dry and "damp" pressing (the latter corresponding to dry pressing as commonly practiced) was accomplished by means of a hydraulic press. In testing two clays, one a red burning brick clay, the other a cream burning limy clay, he obtained the following values for porosity, expressed in per cent. of volume:

	Red burning clay. Per cent.	Cream burning clay. Per cent.
Dry pressed	24.9	32.1
Damp, full pressure	19.9	....
Damp, half pressure	20.2	....
Hand molded	23.9	27.2
Hand molded, repressed	23.7	25.4

Outside of the fact that pressing of dry clay does not result in a dense body, there is shown that maximum density is obtained by pressing damp clay powder under high pressure (provided the clay is ground fine), and that repressing has but little effect upon the density of hand molded clay. The pressure exerted upon the briquets was about 316 pounds per square inch, maximum.

That repressing does not increase the density materially is to be expected from theoretical considerations. However, it causes the removal of air bubbles inclosed in the stiff clay.

Although we have not yet arrived at the discussion of burned clay, it will perhaps not be out of place to mention the results obtained by Prof. Seger in regard to the porosity of the two clays mentioned above after burning at different temperatures. The porosity is expressed in per cent. of the volume of the briquets.

—Red Burning Clay.—

Temperature.	Dry pressed. Per cent.	Damp pressed, half pressure. Per cent.	Damp pressed, full pressure. Per cent.
1000 deg. C.	19.3	16.8	17.7
1050 deg. C.	16.2	11.9	14.3
1100 deg. C.	9.2	4.3	7.0
1150 deg. C.	2.4	2.2	2.5

—Cream Burning Clay.—

Temperature.	Hand molded. Per cent.	Dry pressed. Per cent.
1000 deg. C.	33.1	38.2
1050 deg. C.	29.0	35.7
1100 deg. C.	1.0	18.1
1150 deg. C.	.0	.2

In these figures several striking facts are noticed. At 1000 degrees C. the porostiy of the cream burning limy clay is much greater than in the dry briquets of the same clay. This is due to the loss of the chemical water and the carbonic acid which leave pores in the clay. The red burning clay must also have been affected similarly, although not as much since it has no carbonate of lime, but at the temperature of 1000 degrees C. incipient vitrification has already overcome the increased porosity, since the chemical water leaves the clay at about 500 degrees C.

The sudden decrease in porosity in the limy clay between 1050 and 1100 and 1100 and 1150 degrees, respectively, owing to viscous vitrification, shows the dangerous quality of a limy clay, and illustrates how difficult it is to burn vitrified brick with such a clay. The red burning clay decreases in porosity more gradually, showing that its vitrifaction is a gradual process. The perfectly dry pressed brick show a greater porosity up to vitrification, which, however, puts all the briquets upon the same level. In the case of the limy clay vitrification in the dry pressed test is retarded some 50 degrees, but takes place just as rapidly at the higher temperature as in the hand molded briquets.

What is the practical value of the porosity tests? In what way will they help in the practical problems of the business? They will inform us in regard to the conditions under which the greatest density is obtained; that is, what clay or what mixture of clays will produce the densest body, how much or how little water is necessary, how fine the materials are to be ground, what kind of flint or quartz is best as an addition to the clay, what kind of pressing is most desirable, and finally what temperature of burning is best for the result desired. Such information is yet to be gained in this direction, many problems are yet to be worked out along this line, as is the case in so many departments of the field of clayworking.

—Determination of Porosity.—

In order to get at the porosity of a piece of ware we must know, first, its volume; second, its volume of a liquid which is absorbed by the filling up of the pores. The volume of the test piece divided into the volume of the absorbed liquid multiplied by a hundred will give the porosity of the specimen to be tested expressed in per cent. The volume is best determined by means of a volume meter similar to those used in the testing of cements, and to be obtained from any dealer in scientific instruments. These instruments depend upon the principle of displacement; that is, the test piece is dropped into a vessel connected with a long, graduated tube, and filled with a liquid. Of course the volume of liquid displaced is equal to the volume of the test piece, and can be quickly read from the graduated tube.

It is evident that the test specimen must be made impervious, either by saturating it with some liquid or by coating it with a thin layer of paraffine. The amount of liquid absorbed is also readily determined by means of the instrument, by allowing the test piece to "soak" and noticing the lowering of the level in the tube. The best plan is to determine the volume of the liquid absorbed first, and then to take the saturated specimen for its volume determination. For unburned, dry pieces of clay heavy petroleum must be used; for burned specimens clean water is the proper liquid. The heavy petroleum may also be replaced by mercury.

AMERICUS.

(To be Continued.)

IOWA BRICK AND TILE MANUFACTURERS.

Will meet in annual Convention at Mason City, Ia., Jan. 17 and 18. The past year has been a most prosperous one for Iowa clayworkers, and, in all likelihood, 1900 will be still more so.

To keep up with the procession, every clayworker should attend his State Convention. It pays to exchange experiences and consult with those engaged in the same lines. This is the only way to keep informed as to improvements of methods of manufacture and the best and most effective manner of marketing products. Iowa brick and tile manufacturers are progressive and appreciate these points, so that there will probably be a large gathering at Mason City on the dates named.

Mason City is a prosperous city, located on one of the main lines of the great Chicago, Milwaukee & St. Paul Railway system. It can be easily reached from almost any portion of the State. The splendid train service of the C., M. & St. P. system will insure a speedy and safe journey, and a cordial reception awaits all who attend the Convention. The works of the Mason City Brick and Tile Company will be in operation, and a visit to this up-to-date plant will of itself pay every delegate for the time and expense of the trip.

PROGRAMME TWENTY-NINTH ANNUAL SESSION IOWA BRICK AND TILE ASSOCIATION, TO BE HELD IN MASON CITY, IA., JAN. 17 AND 18, 1900.

(Headquarters Anderson Hotel.)

1. Enrollment.
2. Report of Members.
3. Selection of Committee on Resolutions.
4. Address of Welcome ....Hon. Geo. W. Britt, Mayor, Mason City, Ia.
5. Annual Address by President..O. T. Dennison, Mason City
6. "Drain Tile"....................J. D. Raney, Fairfield, Ia.
7. "Tests of Clay and Clay Product"...Prof. A. Marston, Ames, Ia.
8. "Brick Drying"..............G. A. Wild, Cedar Falls, Ia.
9. "The Individual Application of Modern Trust Principles to Clayworking"..C. B. Platt, Van Meter, Ia.
10. General Discussion.
11. Shrinkage and Fusing Point for Certain Iowa Clays"..................Prof. S. W. Beyers, Ames, Ia.
12. "Hollow Building Blocks".Lynn W. Dennison, Mason City
13. "Best Methods of Increasing Membership of Our Association"..................J. B. McHose, Boone, Ia.
14. "Difference Between Now and One Year Ago"................................C. J. Holman, Sergeant Bluff, Ia.
15. "The Origin of Iowa Clays and Shale"...........
..H. F. Bain, Assistant State Geologist, Des Moines, Ia.
16. Speaker to be supplied.
17. Question Box.
18. Report of Committee on Resolutions.
19. Report of Secretary.
20. Report of Treasurer.
21. Election of Officers.

Banquet will be served.

O. T. DENNISON, President, Mason City, Ia.
ROBERT GOODWIN, Secretary, Redfield, Ia.

PHILOSOPHY FROM VARIOUS SOURCES.

Self-love cures its own wounds.—Dorothea Lummis.

The heart has reasons that reason does not understand.—Bossuet.

A man's good breeding is his best security against other people's ill manners.—Chesterfield.

Work for the character till it be renowned; then it will work for thee.—Tunisian Proverb.

The fate of a nation has often depended on the good or bad digestion of a prime minister.—Voltaire.

As small letters hurt the sight, so do small matters him that is too much intent upon them.—Plutarch.

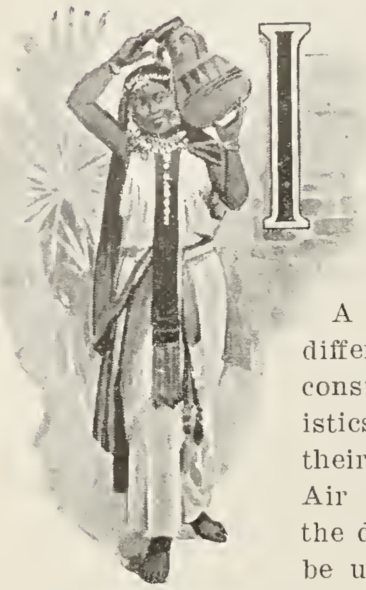
Advice just at present is the greatest drug in the market; the supply has ruined the demand.—Uncle Esek.

Humility is most serviceable as an undergarment, and should never be worn as an overcoat.—J. A. Macon.

There is one broad sky over all the world, and whether it be blue or cloudy the same heaven beyond it.—Dickens.

THE THEORY AND PRACTICE OF GLAZE COMPOSITION.

Lectures by Chas. F. Binns.



IN CONNECTION with the Trenton Technical School Charles F. Binns has lately delivered a series of lectures in this subject, and we are able to give a condensed report of the beginning of the course, which will, we believe, be of interest to potters all over the States.

A glaze is a chemical compound. This differs from a mere mixture, in that the constituent parts lose their own characteristics and acquire new ones by virtue of their combination with other substances. Air and water are familiar illustrations of the different ways in which substannces can be united. Air is a mixture of gases, but, being only a mixture, each gas can be separated without destroying the gaseous condition of the residue. Water is likewise a compound of gases, but in this case they are in chemical combination. Their condition is changed, and remains so as long as the combination is undisturbed. Abstract one of the gases from water and the balance is no longer liquid, it returns likewise to the gaseous form.

Materials for glaze making may be thrown together into a mass, but they will remain uncombined until the fire effects their fusion. Therefore if such materials were not chemically combined the result would not be a glaze at all. Chemical compounds consist for the most part of acid and base or of active and passive principles. Thus the carbonate of potash is a combination between carbonic acid and potassium. These combinations are termed "salts," and may be classified either as regards the acid or the base. On the one hand, there may be a series of carbonates such as the carbonates of potash of soda and of lime, and, on the other hand, there would be a series of salts of potash, such as the carbonate, the nitrate and the chlorate.

In pottery glazes two acids are operative, silicic acid and boracic acid, while among the bases are found leads, soda, potash, zinc, barytes and lime. Alumina also plays an important part, but seems to exercise functions which are partly acid and partly basic. The acid which takes effect in a combination is not that which is originally contained in the basic salts, but that which remains in permanent combination. Thus, although in pearl ash carbonic acid is present, it is driven off by the union of the potash with the stronger silicic and boracic acids. A familiar illustration of this action may be found in seidlitz powders. The effervescence which occurs on the mingling on the two solutions is caused by the escape of the carbonic acid gas which is liberated by the action of a stronger acid.

Chemical combination takes place according to definite laws. Each element or combination of elements has a fixed equivalent or proportion in which it combines with other elements. For present purposes it will be advisable to take for granted the equivalent weights of the substances used in glazing as follows:

$$\text{Alumina } Al_2\,O_3\ 102 \left\{\begin{array}{l}\text{Barytes } BaO\ 152,\ \text{Barytes Carbonate } Ba\,Co_3\ 196\\ \text{Boracic Acid } B_2\,O_3\ \ \text{Crystallized } 124\\ \qquad\qquad\qquad\qquad\ \ \text{Melted } 70\end{array}\right.$$

Borax $Na_2\,B_4\,O_7\,IOH_2O$ Crystallized 382
Melted 202
Calcium Oxide CaO 56.
Calcium Carbonate $CaCo_3$ 100.
Feldspar K_2O, Al_2O_3, $6SiO_2$, 556.
Kaolin $AL_2\,O_3$; $2SiO_2$ 258.
Kaolin Calcined 222.
Lead Oxide $Pb\,O$ 223.
Lead, red $Ph_3\,O_4$ 228.
Lead, white, $PbH_2\,O_2\,2PbCo_3$ 258.
Magnesium Oxide MgO 40.
Potasium Oxide $K_2\,O$ 94.
Potasium Carbonate $K_2\,CO_3$ 138.
Silica $Si\,O_2$ 60.
Sodium Oxide $Na_2\,O$ 62.
Sodium Carbonate $Na_2\,CO_3$ 106.
Zinc Oxide ZnO 80.

The use of the chemical symbols is important, and should be encouraged. They express accurately the composition of each substance, and are moreover the same in every language.

The weights express the amount of chemical work done. In order to equal 223 parts of lead oxide or litharge it is found necessary to take 228 parts of red lead, and in like manner 106 parts of sodium carbonate will do an equivalent amount of chemical work to that done by 138 parts of potassium carbonate.

The constituent parts of any glaze may be conveniently arranged in three divisions. On the one side are placed the bases, on the other the acids, while the alumina occupies an intermediate position. For the sake of preserving a uniform position and to aid comparison, the equivalences of the bases added together are made to amount to unity, the acids vary in equivalence according to the requirements of the work, but must be kept within certain definite limits, and the alumna may be roughly stated at one-tenth the equivalent of acid. Working on these lines it becomes possible to compose any required glaze with confidence that the result will closely approach the desired quality. Supposing a granite glaze of medium fusibility be required the procedure would be as follows:

Taking the bases first. Nearly half the base equivalence may consist of lime, and therefore may be taken Ca0 .45. Lead should be .35 to secure fusibility, and the balance may be equally divided between potash and soda, making the total base:

$Ca\,O$	.45
$Pb\,O$	.35
$K_2\,O$	.10
$Na_2\,O$	.10
	1.00

On the other side the principal acid is, of course, silica or silicic acid, and in conjunction with this, according to the point of fusion desired, boracic acid may be employed. The total equivalence of acid in a glaze such as that under consideration would be about 4, and of this .5 may be boracic acid to secure a low melting point. The alumna is placed at one-tenth of the total acid content. The whole formula therefore stands:

$$\left.\begin{array}{l}CaO\ .45\\ Pb\,O\ .35\\ K_2\,O\ .10\\ Na_2\,O\ .10\end{array}\right\}\ Al_2\,O_3\ .4\ \left\{\begin{array}{l}Si\,O_2\ 3.5\\ \\ B_2.O_3\ .5\end{array}\right.$$

But these figures represent the equivalence of each substance, and not the working weights. Moreover, certain of the chemical symbols cannot well be supplied by actual substances. Alumina, lime, potash and soda are not conveniently obtained as oxides, but must be introduced in such substances as china clay, whiting, pearl ash and soda ash. How much then of each of these will contain the desired equivalence? Whiting is carbonate of calcium, and of this each equivalent contains one equivalent of calcium oxide. The same is true of pearl ash and soda ash, respectively, and china clay contains one equivalent of alumina and two of silica for each equivalent of clay.

We may therefore take:

Whiting, .45 equivalent.
Pearl ash, .10.
Soda ash, .10.
China clay, .40.
Boracic acid, .50.
White lead, .35.
Flint, 2.70.

The amount of silica taken in flint perhaps needs some explanation. As already stated, each equivalent of china clay contains one equivalent of alumina and two of silica. Therefore in taking .40 equivalent of the clay there has, perforce, been included .80 equivalent of silica, and this, deducted from the total equivalence required, 3.50, leaves the equivalence set down, viz., 2:70.

Some of these substances must be made into a frit, and the best glazes are largely fritted. It will be well, therefore, to run down all the whiting, pearl ash and soda ash and boracic acid with some of the flint and a little of the clay thus:

Whiting, .45 by 100, equals 45.00, or melted	25.02
Pearl ash, .10 by 138, equals 13.80, or melted	9.40
Soda ash, .10 by 106, equals 10.60, or melted	6.20
China clay, .10 by 258, equals 25.80, or melted	22.20
Boracic acid, .50 by 124, equals 62, or melted	35.00
Flint, 1.50 by 60, equals 90, or melted	90.00
	188.00

The explanation of these figures is that the equivalent amount of each substance must be multiplied by the equivalent weight of that substance in order to arrive at the working quantity, but in the process of fritting most of the materials lose weight, and the amount of loss is arrived at by multiplying the equivalence by the equivalent weight of the basic oxide instead of by that of the carbonate.

For example, it is necessary to introduce .45, equivalent of CaO, into the frit. To do this we must take the equivalent weight of whiting (calcium carbonate) and mutiply the equivalence by it; thus, .45 by 100 equals 45. But, when it is desired to find the amount of CaO contained in 45 parts of CaCO3, we multiply the equivalence by 56, the equivalent weight of CaO, instead of by 100. This makes evident the fact that a frit into which has been put 45 parts of whiting contains when melted only 25.2 parts of calcium oxide or lime. The reason for this is this, that the reaction spoken of in the beginning has taken place. The silicic acid has driven off the carbonic acid in the whiting and has taken its place. The following simple equation represents the change:

CaCO3 plus SiO2 equals CaSiO3 plus CO2.

That is, calcium carbonate and silicic acid become calcium silicate and carbonic acid. The last named, being easily driven off by heat passes away in the process of melting. It thus becomes easy to understand not only the fact that frit loses weight in melting, but also the amount of the loss. The melted batch of the frit then weighs 188 parts, and to this must be added the balance of the materials.

Frit	188.0 parts
China clay, .30 by 258	77.4 parts
White lead, .35 by 258	90.3 parts
Flint, 1.20 by 60	72.0 parts

And the whole is ground for use.

This method of composing a glaze enables the potter to arrive with ease and certainty at the desired result. It dispenses with uncertain experimenting, and, moreover, leads to the knowledge of the function of each substance in a glaze mixture.

OFFICIAL ANNOUNCEMENT.

The Fourteenth Annual Convention of the National Brick Manufacturers' Association, to be Held at Detroit, Mich., February 5th to 10th, 1900.

To the Members of the N. B. M. A.:

As previously announced, it has been determined to accept the cordial invitations extended by the Governor of Michigan Mayor of Detroit, the brickmakers of that city and others, which were given in full in the previous issue of The Clay-Worker, for they tell of the advantages of Detroit as a convention city so forcefully that we are convinced no better location can be selected for our next annual convention, and we have, therefore, arranged to meet there the week of Feb. 5 to 10, 1900.

Hotel Cadillac will be headquarters and will afford every possible facility for convention work, as well as insure the very best of accommodations for all who attend, for the Cadillac is one of the most popular and best managed hotels in the United States.

—American Ceramic Society—

Will begin the exercises by a meeting in the parlors of Hotel Cadillac, Monday, Feb. 5, at 10 a. m. The sessions of this the scientific division of the National Association, will continue through Tuesday, and will conclude with a session Wednesday forenoon.

The National Brick Manufacturers' Association, the parent body, will hold its first session Wednesday afternoon, Feb. 7, at 2 o'clock, with continuing sessions Thursday and Friday. The annual banquet will be held Wednesday evening, instead of Tuesday, as heretofore. The programme, which has not yet been completed, will include the following addresses and essays, each in turn to be followed by general discussion of the subject under consideration.

PROGRAMME.

"Progress and Prosperity"........Grant Dibert, Pittsburg, Pa.
"The Man Behind the Pug Mill"........................J. R. Copeland, Birmingham, Ala.
"Discipline and Courtesy in a Brickyard"...M. E. Gregory, Corning, N. Y.
"Kiln Experience"............T. C. Lundy, Farmingdale, L. I.
"Down-draft vs. Up-draft System of Burning Brick"...............................L. C. Moore, Memphis, Mo.
"Construction of Brick Pavements"...................................George R. Grimes, Terre Haute, Ind.
"Business Methods in Clayworking"...............................O. T. Dennison, Mason City, Ia.
"Drying Brick with Heat from Cooling Kilns"...............................Robert P. Nesch, Pittsburg, Kas.
"The Market Side of the Brick Paving Industry"...................................F. B. Stevens, Detroit, Mich.
"The Clay Age"....................Fritz Wagner, Chicago, Ill.
"The Continuous System of Burning"..F. S. Naugle, Warners, N. Y.
"Setting Brick in Kiln or Kiln Draft"..................................Warren Ittner, St. Louis, Mo.
"Brickyard Pilgrimages"........Chas. H. Bray, Helena, Mont.

In addition to the foregoing subjects many other questions of vital interest to the brickmaking craft will be fully discussed. Those desiring information on any special topic or theme are requested to communicate the same to the secretary.

Hotel Cadillac, Detroit, Mich.

—Convention and Exhibition Halls.—

Hotel Cadillac will furnish, free of charge, a suitable room for the exhibition of light machinery or models, specimen brick, trade literature, etc. This room is on the ground floor, entirely separate from the Convention Hall, and will afford excellent facilities for such displays as have usually been made during Convention week.

In due time reduced railroad rates will be arranged for and all other details looked after and announced in the usual way. The N. B. M. A. now shares the universal prosperity, an unusual number of new members having been enrolled during the last year, and there is every reason to believe that the next convention will be the largest ever held.

Clayworkers who are not now members, but who wish to join the Association and attend the Detroit meetings, are requested to write to the secretary at Indianapolis for full particulars.

THE EXECUTIVE COMMITTEE.
T. A. Randall, Secretary. W. D. Richardson, President.

CHRISTMAS GREETINGS FROM PHILADELPHIA.

Brickmakers and Machinery Manufacturers Report a Busy Year.

STANDING NEAR THE KILNS, and to leeward of the sun and the dust, Eugene and Peter Carroll and The Clay-Worker scribe were engaged in the exchange of those small pleasantries which the human heart seems prompted to make at this time more than at any other period. It is the better side of our nature asserting itself, and in the pressure of the hands accentuating itself by a brighter and keener lighting of the eye, there always seems to be, and there really is, a broad medium of good feeling in the hearty and tuneful good wish: "The same to you, old fellow, and many of them."

The weather, pure, prime Californian, was strangely incongruous. Here it is within ten days of Christmas, and the men still hacking brick. But no matter. Every human Jack and Jill has struggled bravely through his local environments, his good luck and the bad, and, God willing, every man promises to himself, his kith and kin, a happy Christmas. Over the wires, the 'phone, and mingling with the atmosphere, as in the days of "the cricket on the hearth," the echoes sing, "God bless you all."

The sturdy Carrolls, rejoicing in a good season, and a late one, said: "We've no cause to complain, except sometimes the boys down in the Neck encroach upon what we think our territory, although, of course, we wouldn't kick at this if only they didn't attempt to sell cheaper than we do." This, as you all know, is not an ailment or a grievance that is confined to this particular locality. You have all had the same experience. This will right itself. The "Neckers" have, in a measure, been somewhat isolated. South of Grey's Ferry road the land has been held by the little truck farmers, but in the very near future the government will take up in all earnestness the extension of League Island; government workshops will be erected, and some 6,000 acres lying between the Ferry road and the island will become a theater in which human hands and minds will forge the links of progression by an absorption of labor and millions of hard stretchers and repress brick. Then you boys of West Philadelphia can turn the tables and sing:

"From East to West we shipped our brick, by carload and by
 peck,
But, Jimminee! you soon will see we'll shove them in your
 neck."

Walking down the avenue, I viewed with pleasure the recently finished two-story houses, gleaming bright with the clean, deep-colored stretchers from the above yard, and at Fifty-second street, below Lancaster avenue, turned into the big factory of the

—Chambers Bros. Company,—

And learned from Mr. J. H. Chambers that everything was moving along in first-class form. In fact, to quote his words, "Business is better by 30 or 40 per cent. than it was in 1898. We have a contract from Mr. Jos. R. Wilson, of the Baltimore Brick Company, to put in an entire new outfit, in the Monument-street yard, and this machinery will increase the capacity by 60,000. The Pitcher yard, at Baltimore, is to be remodeled and machinery added. This will give both increased capacity and improved quality of brick. The Knecht yard, at Bear's Creek, is to have a new machine and additional capacity. In addition to this, we have just shipped a carload of machinery to Louisiana, to be put up right away, and a new machine to Salisbury, Md., 25,000 capacity, is en route. We are now working hard to complete a whole outfit of 40,000 capacity, to be shipped at an early date to Germany."

Here we parted, with mutual good wishes for the continuance of prosperity.

—George Carnell,—

The brick machine manufacturer was found up to his eyes in work. In reply to my query as to business, answered: "I've no cause to complain; we're full up, and we have got to hustle to get the work out by February. Just now four single presses are being shipped to Johnstown, Pa., four to Kingston, Pa., two to Cleveland, O., one to California, and one to Bloemfontein, South Africa, I'm afraid, will have to be held over. Come in later and we will have a chat with you."

—Frank McAvoy—

Was the next to take and give a greeting. "At our Frankfort yard Alec is still working hard, and has little in the yard except a few stretchers. At Perkiomen we are turning out 35,000 a day. We have made a second shipment to Havana, so we are nearly cleaned out. The prospects for 1900 are good, and this means hustling. The next surprise for Philadelphia will be the formation of a syndicate. We have options on two-thirds of the yards." The story in its entirety we'll reserve for the next issue.

The recent exposition did not offer anything that could appeal directly to the clayworker, unless it was the attractive columns of Leviathan belting set up by

—The Main Belting Company.—

As will be seen by the accompanying illustration, the display consisted of huge columns of four, five, six, eight and ten-ply belting, while in the center rose one taller than the rest. crested with a huge golden eagle. Sections and half-sections of the scarf-splice lacings, etc., interpolated the space between, keenly and courteously superintended by Mr. Roth. We visited the office to-day, and made an inspection of the two right new belts to be shipped. These run 150 feet long and eight feet wide. Consult your catalogue, and this one order alone will substantiate what I say: that they are always busy, and with them courtesy is an everyday glove. "Our prospects for the new year are very bright, and local conditions point to a good increase in the volume of business. Remember us to Mr. Randall. Thanks, we wish you the same."

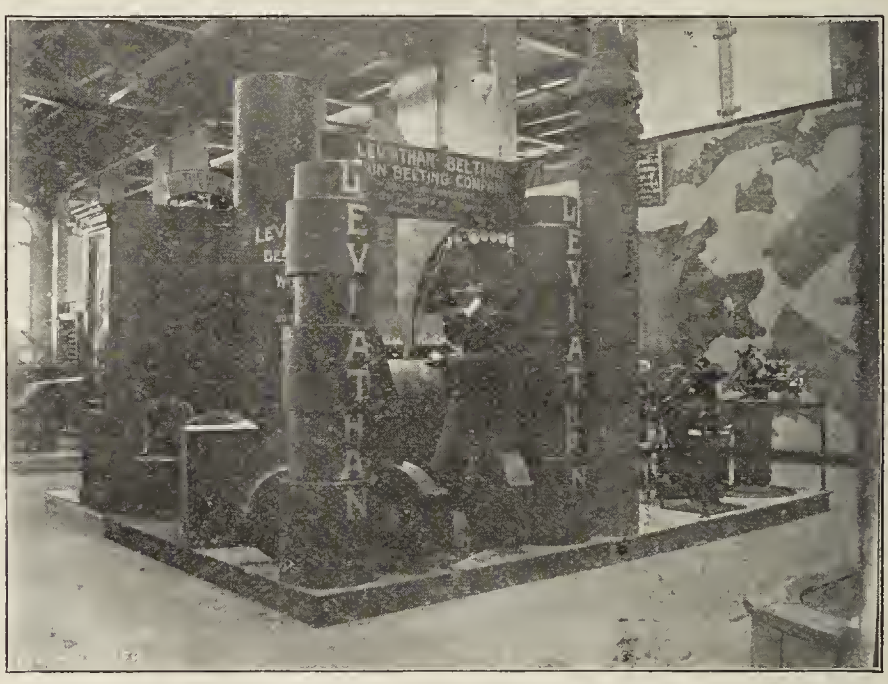


Exhibit of the Main Belting Co., at the Philadelphia Export Exposition.

—Fire at the Carroll's Yards.—

Too bad! Every one sympathizes with them. The fire broke out on the morning of the 15th, in the dry shed, and, fanned by a stiff northwester, soon began to eat its way around. All hands responded, and the brothers, Peter, Eugene and Michael, from the hand yard, worked like Trojans in support of the firemen. Success attended their efforts, and the engine and machinery were saved, but not until the dryer was totally destroyed and the fronts of the kilns badly charred. On my arrival there, at 5 p. m., I found about 100,000 green brick destroyed, and plant damaged to the extent of $10,000, partly covered by insurance. All wish them better luck next season.

—Webster & Nephew.—

Here Foreman Keyser greeted me with loud praises for the Martin dryer. "We've cut it down from 170, and make two 110 feet long. It would be all right in a new yard, where, of course, you'd make the grade to suit the length. Here we found 170 feet too long. The consequence was the water backed up on us, and we have made the grade four inches more, and it works fine. We sold the old cars for almost as much as we gave for them. An iron man came along and gave us $14.50 per ton, which means the cars brought $4 apiece, and the grand joke is I offered to sell them to one of our neighbors for $2 apiece, last spring, and he would not have them. So I guess we'll keep Christmas all right. We got out about 8,000,000 to 10,000,000 this year, and have a few left over for the spring.

—Murrell Dobbins.—

Seated in his office armchair, at the Master Builders' Exchange, extended the hand. "No, I haven't much to say, except the season has been a fairly good one, and the outlook for 1900 is better. My best wishes to Mr. Randall and The Clay-Worker. Good-bye."

To Mr. William Conway and other brickmakers on whom I called, but failed to see, I now send greetings, with heartiest wishes for a happy Yuletide and a prosperous New Year.

Philadelphia, Dec. 9, 1899. W. P. LOCKINGTON.

CAPITAL NEWS OF INTEREST TO BRICKMAKERS.

THE BRICKMAKERS of Washington have reason for giving thanks for the good weather that has prevailed here throughout the fall and allowed the running on of business without interruption by cold. It is possible that work in most cases will extend into the winter, if we have the average weather conditions of this locality, which not infrequently gives us moderate warmth until about Christmas. But if all work were stopped now the brickmakers would have little to complain of, for the past season has been one of profit and of less trouble to them than has been the case for some years.

The latter fact, of course, is due to the efficient offices of the Standard Brick Co., which has lightened the labor of the producer and has given him a fairly ready market for his product. So, when the "winter of his discontent" (?) gives him time to sit down and count his blessings, the Washington clayworker can say that "things have gone his way in the way of shekels," and he can look forward with confidence to a more prosperous year in the beginning of the new century, for, in all probability, there will be a great deal of work at the capital next year and a large demand for brick.

The largest item in this particular will be in connection with the new Government Printing Office, about which The Clay-Worker has told its many readers. Ten millions of brick will be required for this huge structure, and, of course, the home product will be mainly, if not altogether, utilized in this work. The 1,500,000 buff brick, also spoken of in a previous letter, can be supplied from yards near this city, one of which, Mr. John Miller's, possesses a fine quality of clay of the requisite colors for the making of buff material.

It may be of interest to the readers of The Clay-Worker to learn that it is probable that an addition will be made to the White House. A bill calling for an appropriation for this purpose, it is said, will be introduced in Congress by Senator Cullom, and if such a measure goes through Mr. McKinley should have more room in the not distant future.

Although we know that there is not room enough in the White House for both family comfort and official business, the latter something that is continually on the increase, yet it seems almost wrong to mar the historic features of the old edifice, whose roof has sheltered the chief magistrates of our country for nearly a hundred years. The White House was first occupied by John Adams in 1800; it was destroyed by the British in 1814, and being rebuilt on the original plans, was first again occupied by President Monroe. It is two stories high, 170 feet long, and is modeled after the palace of the Duke of Leinster, Dublin. The architectural style of our American palace is not particularly ornate, but is massive and grand, as it should be. And I doubt much if any addition could be made to it that would not mar its chaste, imposing beauty.

If Congress wishes to do the right thing let it appropriate half a million of good United States dollars to build a fitting private residence for the use of this country's Presidents, and let the venerable White House be the chief magsitrate's office —the executive department.

Now a little more about building and business and I am through for this trip. The fiscal year of 1899 has given to the District of Columbia something over 4,600 new buildings, and from 1892 to the year above mentioned the whole number of structural additions to city and district has been nearly 33,000, the cost of which amounts to the great sum of $51,700,000.

Of course a great deal of building has been done since the ending of the last fiscal year, and the rounding out of the calendar year and beginning of the new century will find the capital with a good building record for 1899.

A merry Christmas for you all,
Good cheer, but not too gay;
And may life's sunshine softly fall
On men who work the clay.

NICODEMUS.

AN HUNDRED MILLION PAVING BRICK.

The past year has been the busiest in the history of the paving brick industry at Canton, O. Canton pavers are in great favor, so much so that the combined capacity of all the Canton plants is scarcely equal to the demand. Mr. J. L. Higley, the indefatigable manager of the Canton Brick Exchange, says that this year's output will approach close to the 100,000,000 mark, and that if this number of brick were placed end to end they would reach from New York to San Francisco and back again. It would require five hundred trains to carry them. All of the plants are still running, but will close down during the holidays in order to make repairs and get everything in good running shape for the next season. Orders are still coming in, which is rather unusual for this time of year. Mr. Higley anticipates an equally busy season next year.

THE PRANGLEY BRICK MACHINE.

On another page will be found an illustration of the Prangley brick machine, for which many advantages are claimed by the inventor, Mr. James Prangley, of Lancaster, Pa., a successful brickmaker of some thirty years' experience, who says that the machine is built in such a manner and of such material as will enable it to withstand the rough usage incident to brickyard work; that it will mold brick very stiff and very rapidly, giving it large capacity and long life. In short, he thinks his machine will fill a want long felt by the brickmakers throughout the country, who are invited to investigate its merits thoroughly. The machine can be seen in operation at Mr. Prangley's brick plant at Lancaster, Pa. Mr. Edward C. Huhn, of Philadelphia, Pa., is selling agent, and will be pleased to tell the readers of The Clay-Worker who are looking for a good soft-mud brick machine all about this machine.

BUSY FIRE BRICK MANUFACTURERS.

Editor The Clay-Worker:

On Jan. 1, 1900, twenty-seven blast furnaces, lined throughout with brick made by the Kentucky Fire Brick Works, of Firebrick, Ky., will be in blast. The number of high-grade brick works in this country that can equal this record is exceedingly limited.

The factory at Firebrick, while very old and of established reputation for its products, has been kept modern by the addition and adoption each year of any features calculated to improve the quality of the product or the excellence of its service to the company's patrons.

It is one of the largest fire brick plants in the United States, and is located in the midst of several thousand acres of the celebrated Kentucky flint clays owned by the company.

Yours truly, KENTUCKY FIRE BRICK WORKS.

Firebrick, Ky., Dec. 15.

LIFE'S CEASELESS GRIND.

"Our brains are seventy-year clocks. The Angel of life winds them up once for all, then closes the case and gives the key into the hands of the Angel of the resurrection. Tic-tac! tic-tac! go the wheels of thought; our will cannot stop them; they cannot stop themselves; sleep cannot stop them; madness only makes them go faster; death alone can break into the case, and seizing the ever-swinging pendulum silence at last the terrible escapement we have carried so long beneath our wrinkled foreheads. If we could only get at them as we lie on our pillows and count the dead beats of thought after thought jarring through the tired organ! What a passion comes over us sometimes for silence and rest! If anybody would only contrive some kind of a lever that one could thrust in among the works of this horrid automaton and check them or alter their rate of going, what would the world not give for the discovery?"—Oliver Wendell Holmes.

THE RECORD OF THE YEAR.

Busy Manufacturers Tell of Prosperity—Clay Machinery Firms Well Satisfied with the Old Year and Hopeful for the New.

‘TIS SAID THERE is but one way to judge of the future, and that is by the past. If we may judge the new year by the old there is a very busy season ahead of the clayworking world. We have recently received letters from a few of the representative manufacturers of clayworking machinery, and as they are of interest, in that they indicate the trend of trade conditions, we lay them before our readers. They were not written for such use, nor are all the representative firms included, but there are enough to indicate the general situation.

Office of D. J. C. Arnold, Manufacturer of Brick and Tileyard Supplies.

New London, Ohio, Dec. 6, 1899.

Publishers Clay-Worker:

Your favor of the 30th ult. was duly received. I do not set myself up for a prophet, but, as you say, the outlook for 1900 at the present time is quite cheerful. Our business for 1899 has been quite satisfactory. We have made and sold more goods than in any previous year for some time past; in fact, along some lines we have sold more than ever before. Very respectfully,

D. J. C. ARNOLD.

Office of H. Brewer & Co., Manufacturers of Clayworking Machinery.

Tecumseh, Mich., Dec. 12, 1899.

Publishers Clay-Worker:

In reply to your favor of the 30th ult. would state that we find the volume of business of 1899 to have exceeded that of 1898 by nearly 50 per cent., and that we confidently and conservatively expect that the business for 1900 will be double the amount of 1899. A careful investigation of our records shows that it has been years since we have had as many available prospects at this time of the year as we have at present, and we are taking orders now for machinery to be delivered in the spring. We are more than pleased with the season's business just finished, and also with the outlook for 1900.

We have a number of new machines nearly ready to introduce, and a long list of improvements about to be adopted. We are going into the field this coming season to fight to a finish for our share of the trade, and more, if we see a chance to get it. We look upon the clayworking industry as a comparative infant, believing that with the manufacturer rests largely the responsibility of its breeding and education, and we consider the forty years during which we have been connected with the business as but a moment in comparison with the opportunities which have been and will be presented for improvement. In fact, we cannot convey to you the degree of confidence and satisfaction which we have in the business of the past and the prospects for the future. Yours respectfully,

H. BREWER & CO.

Office of Chambers Bros. Co., Manufacturers of Brickmaking Machines, Clayworking Machinery.

Philadelphia, Pa., Dec. 2, 1899.

Publishers Clay-Worker:

The volume of business with us this year will be 30 to 40 per cent. in excess of that for 1898. We are very busy now, and have some contracts that will require several months to complete. We have a very general inquiry from all parts of the country that indicate a general improved demand for machinery, and we expect to be busy right straight along. The very extensive improvements of the Baltimore Brick Co. will be pushed vigorously this winter. The contract for this machinery has been awarded to us. We are shipping machinery to-day to the Southern Clay Product Co., and have orders from Louisiana and other Southern points. Yours respectfully,

CHAMBERS BROS. CO.

Office of W. A. Eudaly, Round and Square Down-draft Kilns.

Cincinnati, Ohio, Dec. 2, 1899.

Publishers Clay-Worker:

Your valued favor of the 30th ult. at hand and contents noted. Referring to next year's business, I beg to say that the outlook for me is rather flattering. I believe that the brick manufacturer and the supply men next year would do a magnificent business were it not for the fact that the raw material for making all kinds of machinery and brickyard supplies is so unreasonably high. I find a great demand for brick, however, everywhere, and this great demand and the scarcity of brick next spring will undoubtedly stimulate business very much. Yours truly,

W. A. EUDALY.

Office of The Frost Manufacturing Co., Manufacturers of Engines, Boilers and Dry Pans.

Galesburg, Ill., Dec. 7, 1899.

Publishers Clay-Worker:

We are in receipt of your letter of yesterday, in which you ask us how trade has been the past year.

Our sales for 1899 have been larger than for any of the forty-eight years we have been in the business. It became necessary for us to refuse orders, as we had taken more than we could fill about July 1 last. We have already contracted to furnish more engines and boilers than we can manufacture during the next twelve months. The result of this condition of affairs is that we are forced to expand. We have contracted for machinery for a complete new plant which, when done, will be a model manufacturing plant for this line of business. We will cover about six acres, and hope to be able to fill all the orders we can land from now on. Our advertisement in The Clay-Worker is bringing us inquiries in every mail, many of which develop into orders. Yours very truly,

THE FROST MANUFACTURING CO.,
Andrew Harrington, Secretary-Treasurer.

Office of Phillips & McLaren, Manufacturers of Grinding Pans, Etc.

Pittsburg, Pa., Dec. 18, 1899.

Publishers Clay-Worker:

We have been so busy getting out urgent orders that we could find no time to reply to your kind inquiry of recent date.

The past year has been one of exceptional increase in demands for our Standard crushers, grinding pans, pulverizing and mixing machines, and the demand still continues, and we see no reason why it should not for the coming year.

The desire of buyers now seems to be to get the best, and a great part of our orders are from old customers, who are enlarging or building new works, and they all want the very highest-grade machines.

We are now working on orders for several new plants for making high-grade fire brick and silica, also some for building and paving brick, and for a number of Portland cement works.

Our entire plant is working to its full capacity and making overtime.

Wishing you the compliments of the season, we are, very truly, yours,

PHILLIPS & M'LAREN.

Office of the C. W. Raymond Co., Manufacturers of Clayworking Machinery.

Dayton, Ohio, Dec. 2, 1899.

Publishers Clay-Worker:

Replying to your valued communication of the 30th ult., will say that our business for this year showed an increase over last of 118 per cent. At present we view the outlook for the coming season in a very favorable manner, and believe the volume of business secured will be satisfactory to the average manufacturer. Yours very truly,

THE C. W. RAYMOND CO.

Office of J. C. Steele & Sons, Manufacturers of The "New South" Brick Machinery.

Statesville, N. C., Dec. 8, 1899.

Publishers Clay-Worker:

Trade has been very gratifying to us the past year, we having done about one-third more business than in any previous year. A large amount of building has been done throughout the country, and owing to the fact that the forests are fast disappearing large numbers of bricks are being used, therefore a large amount of brickmaking machinery is necessary for making good brick economically.

We think that the outlook for the new year 1900 is very flattering for brickmakers, in view of the fact that there is very few bricks in the country, and prices are satisfactory. Yours very truly,

J. C. STEELE & SONS.

NEW ADVERTISEMENTS.

The Harrington & King Perforating Co., Perforated Metal	422
Chisholm, Boyd & White, Dry Press Machinery	424, 425
Ross-Keller Brick Machine Co., Brick Press	429
Wellington Machine Co., Soft Mud Brick Machine	465
H. Brewer & Co., Brick Machinery	467, 499
C. & A. Potts & Co., Brick and Tile Machinery	469, 497
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CONVENTION DATES.

Illinois Clayworkers' Association, at Ottawa, Ill., January 9-10, 1900.

Iowa Brick and Tile Association, at Mason City, Ia., January 17-18, 1900.

American Ceramic Society, at Detroit, Mich., February 5-6, 1900.

National Brick Manufacturers' Association, at Detroit, Mich., February 7-10, 1900.

Ohio Brick, Tile and Drainage Association, at Columbus, O., February 13-14, 1900.

Nebraska Brickmakers' Association, at Omaha, Neb. Date not announced.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

An Illinois Brick and Tile Man in Porto Rico.

Publishers Clay-Worker:

Inclosed find postoffice order for $2, for which please mail The Clay-Worker to my address here. I cannot do without it. I would like to have the Drainage Journal also. Well, I am not in the brick and tile business here, but am working at my trade as carpenter. I have fifteen carpenters under my instruction and three bricklayers. I have 25,000 feet of cement to put in, but I must have The Clay-Worker so as to keep posted, for in 1901 or 1902 I expect to be making brick and tile again at my old place of business in Mendota, Ill. I am sorry I cannot be with you at the Illinois Convention, but I send my best regards to all. There will some day be a good opening for brick and tile here, as they are scarce now at 12 pesos per thousand, which is $7.20 in our money. The climate is very fine here. I have slept since I have been here, seven months, without any covering but a bed sheet; even now it is just as warm as in July in your part of the country. The nights are very pleasant. Please send me five or six of your hat calendars if you have any this year, and greatly oblige.

Yours respectfully, WM. STARE,
Treasurer Illinois Clayworkers' Association.
Ponce, P. R., Nov. 30.

Convention Thoughts.

Editor THE CLAY-WORKER:

Time flies so swiftly that I am at a loss to know how to keep up with it. The to-morrows so crowd on the heels of to-day that I can almost feel the stone bruises. The old theory, "to push things rather than have things push you," is surely laid in the grave with stage coaches and spinning wheels. Seemingly it is but a few days since we were at Peoria enjoying the hospitality of that thriving city, and vowing by the corks of Jerusalem that it was the best Convention yet. But it has been nearly a year, and the Nation's historical page is sure to be a large, rich one. One can almost ask, "Where has the year gone? What has been accomplished? Have we used it to the best advantage personally?" The writer can only answer it like the old lady: "It might have been worse."

Yes, "the year has gone, and with it many a glorious throng of happy days. Its mark is on each brow, its shadow in each heart." While the quotation continues, "'tis a time for memory and for tears," the writer thinks such should not be the case, but rather it should be a time of rejoicing, chock full of hope and determination, with a rich store of experience that will help us for at least another twelvemonth.

While trying to see where the past year has gone, we involuntarily look to the coming year, vainly trying to discern our path and its connections. The first picture of interest is the city of Ottawa. There we will meet brother clayworkers from all sections of the country, each one having the same interest, each one, relatively speaking, having the same environments, each one striving to better his condition, and each one ever willing to assist the other. Truly, we are brothers in mud. Then comes the question, Will the Convention be a good one? The writer feels like answering it by asking the old question, Does a cat like milk? Has anything failed this year? The signs of the times point to a big Convention, and surely the signs are right.

The word clayworker embraces more than has been realized heretofore in our Conventions, and an effort is being made this year to cover more territory—to follow the national example of expansion. We want the pottery interests represented, and expect an article or two from that branch of the industry. In fact, it is our hope that all who either mine, mix, mold, press, bake or burn clay of any kind will be represented and take an active part in the Association for their own good and for the good of the Association.

The writer would like to make a personal canvass of the State, entreating all who never attended the Convention to join with us just once. I think I am safe in saying all who ever attended once never failed to attend the second time if possible. Probably some will be so busy this year they will feel the time cannot be spared, but undoubtedly if they will drop the cares of business for a few days, take a holiday or two and join in the spirit of the Convention, they will be amply repaid and never regret it for a minute. On to Ottawa!—where we meet again. A MEMBER.

Kiln Comparisons.

Editor THE CLAY-WORKER:

Very much has been said about kilns, and much more remains to be said, and from time to time a new kiln made from some old one is put upon the market, and its good qualities for cheap and uniform burning are said by the patentee to be without an equal. I do not wish in this letter to speak of the good qualities of any new kiln or the bad qualities of an old one, but I do wish to compare results of the kilns we now have in general use. There are three classes of kilns—up-draft, down-draft and continuous. The up-draft kilns are all very much alike, and the results in them are about the same everywhere.

Enough of these kilns, properly constructed, to burn 30,000 brick daily, will cost at least $6,000. The cost of fuel per thousand brick will be from 75 cents to $1. The cost of labor for burning will be from 20 to 30 cents per thousand brick. This does not include the cost of delivering the fuel to the kilns. This shows that the cost of burning brick in the up-draft kiln is from 95 cents to $1.30 per thousand brick.

Now a sufficient number of well built down-draft kilns to burn 30,000 brick daily will cost $15,000. Note the cost. The cost of fuel and labor per thousand brick for burning in the down-draft kilns will not differ much from the up-draft kilns. However, I believe the cost will be a little lower, perhaps 15 to 20 per cent. less.

A continuous kiln well built and large enough to burn 30,000 brick daily will cost $8,000. The cost of fuel for burning in this kiln will be from 25 to 35 cents per thousand brick, and the cost of labor for burning will be from 12 to 15 cents per thousand brick. This makes the cost for burning in the continuous kiln from 37 to 50 cents per thousand brick.

Now as to the quality of the burning; if we can get 90 per cent. of hard brick from the up-draft kiln and 95 per cent. of hard brick from the down-draft kiln we feel that the burning is satisfactory. But in the continuous kiln we get 100 per cent. hard brick. I have heard contractors buying brick from the continuous kiln ask for soft brick and fail to get them, as none of that kind came from the kiln.

The above statements of facts shows the continuous kiln to be the most economical, yet we have but few kilns of this class in successful operation in this country. You ask why?

The reasons briefly stated are: First, bad material and bad construction employed in the building of the kilns. Second, a lack of knowledge and skill in operating the kiln. These two facts have led to some failures with continuous kilns, but the time is coming, and not far distant, when the continuous kiln will be in general use and demand. It has passed the experimental age, and is now a success. We must learn to burn our brick at a less cost, and the continuous kiln is our only hope. ITHAMAR.

St. Louis Clay News Notes.

Editor THE CLAY-WORKER:

The year's work will not wind up as satisfactory here in St. Louis as was anticipated in the spring. A number of fine commercial buildings were erected in the down-town district which are now nearing completion, but the demand for brick residences and light structures was not half of what was anticipated. The fact is that St. Louis is suffering on account of its solidity. During the last six years she has built largely in excess of the normal increase in population. Many of our land holders held their property clear of all incumbrances, and had money to invest. The cheapness of building material was attractive, and they built for an investment.

Within this period another feature has crept into the St.

Louis market, which is what is known as flats. Hundreds of these structures have been erected, and this has added largely to the consumption of brick. The apartment house fever has not yet reached us, but it soon will appear. The investor and flat builder have more than kept abreast of the demand, and now St. Louis will have to wait until the population overtakes the present supply of houses and flats already provided.

The present high price of building material has shut out the speculative builder. He cannot secure a loan large enough on his property to give him a sufficient equity on which to speculate. While his methods may have been questionable from a certain standpoint, his purchases were an excellent adjunct to the sales of brick and other material. Prices are firm and no cutting apparent. The World's Centennial Exposition fund is now over four million dollars, and the last million is being slowly subscribed. The danger of failure is past; it remains only for a few men to put their shoulders to the wheel and push the subscription beyond the five-million-dollar mark. St. Louis cannot afford to fail in this work; she has gone too far; her record is at stake, and the "mountain of conservatism" about which I wrote you many months ago is to be removed. We are going to have a world's fair which will be a credit to the States included in the Louisiana purchase. Their resources are unlimited, and their wealth is boundless. The result to St. Louis will be a clearing up of her down-town districts, rebuilding of worn-out streets and new avenues laid out and paved, extensions of rapid transit facilities and improvements made which will be of lasting benefit to the city.

We will, too, share in the benefits if we are not stopped by strikes and causes such as Chicago is struggling with today. Steps have already been taken to arrive at a means to prevent such a catastrophe. Committees have been appointed from the various trades organizations, Master Builders' Association and St. Louis Chapter of American Institute of Architects to adopt a "code of practice." It is to be hoped that the allied wisdom of the various interests will be successful in formulating a plan which will be effective, and that St. Louis will escape any serious labor troubles either before or during the building of the exposition.

From general talk a goodly number of Missouri's clay-workers will attend the next N. B. M. A. Convention at Detroit, and we hope to have two cars filled from St. Louis this year instead of one.

T. P. PLUMRIDGE.

Chicago Brick News—Union vs. Non-Union Methods—Builders and Architects Mingle—Strike at Terra Cotta Works.

Editor The Clay-Worker:

For a "write-up" as to the Chicago situation as it really exists one is apt to acquire the appellation of "Calamity Howler," but facts are sometimes well to adhere to, as in showing a weakness some plan may be evolved whereby conditions may be bettered. Since my November letter the exactions of the trades unions and their expressed determination to carry their point, and an equal determination on the part of the contractors to take issue with the Building Trades Council, and have it settled once and for all time as to "who is the best man," is not conducive to healthy trade. The official record of permits for November, with the estimated cost, as compared to November, 1898, tells the story. November, 1899, falls short $959,550; this, with the shortage for October of some $600,000, makes a total of one and one-half millions of dollars for the two months, a small percentage of which, if allowed to percolate through channels whereby coal and groceries would be little less than luxuries to the laboring world of our city, would do more to sustain life and strength than a regiment of walking delegates.

A few of our contractors favor a lock-out. This would mean to the material man a tie-up of thousands of dollars of property and enforced idleness of men who want to work, and an untold expense in the way of fixed expenses which cannot fluctuate with the mercurial temperament of supply and demand, and the sum total of the contractor's "dead stock," in the event of a lock-out, would be infinitesimal in comparison. In the meantime the material man is between the upper and nether stones of the union labor and Contractors' Universal Milling Association, trying to look happy, and he surely is busy, as should the mill slack down through want of wind (which is not likely), the Chicago press can supply a few items in which they show in as reprehensible a manner as possible the association of the different interests (which are purely in self-defense, and in opposition to the greatest combination of all, the labor unions), and they touch very lightly upon the exactions of the unions. Unfortunately for Chicago, we have an election in 1900, and the labor vote is not to be sneezed at, or, if sneezed at, it must be done with circumspection, and with due regard to the sneezee. It may reach a point where some genius may work out a scheme of organizing unions among the different crafts only of men who want to work and who will accept remuneration in proportion to service rendered. It must be admitted that there are such men, as not a week passes but is recorded some assault, the victim a workman endeavoring to provide for his family, and the aggressors "business agents" or "committees" from the various unions.

Were the truth known, not all the heroes of the present time are in Cuba or the Philippines. They can be found in the ranks of the artisan or laboring man, going to and returning from their daily labor, in bands of sufficient numbers, as were our Puritan ancestors obliged to do, for their mutual protection. There is this difference, however: the Puritan did not hesitate, and, I believe, rather enjoyed a "pot shot" into a flock of noble red men, and to the one with the best score accrued the more honor. With us, let a nonunion man show a pistol in his protection, no matter what the provocation or the number of his assailants, and he is promptly arrested and fined $5 and costs, and the daily press have yet to record the arrest and conviction of a union man as assailant, although these assaults are of so frequent occurrence that they form a regular item of news, but not of sufficient importance to call for editorial comment. In addition to assaulting the workmen not of their mind, the unions have another trump card which they play, viz., visiting buildings at night and defacing woodwork, painting and plumbing to such an extent as to necessitate the replacement of the entire work.

United States Labor Commissioner Carroll D. Wright, in a recent interview, suggested as a remedy for Chicago labor troubles the adaptation to the conditions by both the unions and the contractors the precepts of the Golden Rule. I don't know how it is in Mr. Wright's burgh, but in Chicago the Golden Rule is designated thusly, $. There are hopes, however, of a satisfactory settlement of the differences in the efforts of M. B. Madden, president of the Western Stone Company, whose work among the different leaders the past week, notwithstanding the attacks of some of our progressive (?) editors—who see in the move political prestige, instead of heading off an industrial calamity—has resulted in a call for a meeting early this week, with a view of establishing a permanent board of arbitration for the government of all labor disputes. It remains to be proven whether arrogance and injustice will give way to moderation, common sense and business principles, and both the labor leaders and the contractors must learn that their interests are in common, and a I-don't-want-to-play-in-your yard-position assumed by either is both useless and expensive. In the face of impending disaster, even as Nero scraped the squeaky bow and thereby detracted the attention of the volunteer fire department of Rome, to the detriment of that unfortunate town, does the gregarious architect and material man assemble, and, to the music of popping corks and rattle of knives and forks, devote himself to the pleasures of the hour, and the exactions of the owner and walking delegate are as phantoms of the past.

November 27 the annual Thanksgiving festivities of the Chicago Architectural Club occurred at the club rooms, in the Art Institute, unders the auspices of the associate members. This club is worthy of mention, as it is composed of the younger architects and draftsmen, and the associate members are from the building and supply trades, by special dispensation of the management of the Art Institute. Their club rooms are adjoining the rooms of the Illinois Chapter of the American Institute of Architects, and the weekly Monday evening meetings are of great benefit to the rising architect, as well as to one not in the profession, as technical questions in reference to construction, stereoptican views and informal talks, in conjunction with the social features, give to the club a well-deserved prestige.

The Builders' Club has again scored a success in a reception and "smoker" given the members of the American Institute of Architects and the Architects' Business Association, at the club rooms in the Chamber of Commerce building, the evening of the 7th inst. Seventy-three architects and guests and some fifty of the club members, after the discussion of a substantial dinner and enjoying the selections rendered by the Lexington quartet, in the persons of John R. Matheny, W. J. Brooks, Sam W. Hurdle and Frank J. Knowles, settled themselves in their chairs, and, fortified with fragrant Havanas, were ready for what the fates might decree. President E. Kirk, Jr., in a short address of welcome, congratulated both the architects and builders that such a meeting as this was possible, and he assured the guests that as a social time only was anticipated, no shop talk would be permissible. Notwithstanding this hint, it was hard for the different speakers to confine themselves to any subject and not refer to the strained relations existing at the present time between the contractors and the unions, knowing, as they did, that these self-same relations were the primary cause whereby the mutual interests of the architects, contractors and material men were exemplified.

Among the speakers were the following: W. D. Gates, W. L. B. Jenney, W. B. Mundie, D. V. Purington, George Beaumont, M. B. Madden, Wm. Grace, J. G. McCarthy, Jas. A. Hogan and C. W. Gindele. In thus particularizing I bear in mind the protest of J. G. McCarthy in referring to reports of former festivities where oratory was rampant, as "speeches were made by President Kirk, Mr. Madden and others." Mr. Beaumont, president of the Architects' Business Association, congratulated the members of the club for their sagacity in organizing, as thereby they were doing a grand work in dispelling jealousies of trade, and in personal associations raising the standard of ideals, as such associations perforce must do. He also called attention to the benefits of organization in the fact that through the organization of the Builders' Club its members had the pleasure of entertaining the architects. He warned them, however, not to expect reciprocal favors, at least until the fees of the architect would admit of entertainment equal to this. He urged a closer affiliation of the architects and builders and a loyalty to their mutual interests. Wm. Grace suggested that the duty of representative men lies in striving for a higher standard of municipal government, as, given an attractive city, prosperity is sure to follow. James A. Hogan, in delivering his inimitable bon mot, "The Bells," covered himself with glory, and accepted the plaudits of his hearers with his accustomed modesty. C. W. Gindele, in the course of his remarks, said that they were not striving for the death of labor organizations, but for a modification of obnoxious rules.

Immediately upon adjourning from the dining hall to the club rooms, the company were treated to the following vocal selection, entitled "U. B. D." Tune, Upidee. All rights (to kill the author) reserved:

The builders they are out to-night,
U. B. D., U. B. D.,
And union labor in a fright,
U. B. D., U. B. D.,
A foxy crowd they are, indeed,
And union boys had best take heed.
Chorus—
You builders now please take a rest,
U. B. D., U. B. D.,
Wipe off your chin, pull down your vest,
U. B. D., U. B. D.,
And better times will come some day,
When unions they have had their sway.
Chorus—

Architecture is our forte,
U. B. D., U. B. D.,
The last four years it was no sport,
U. B. D., U. B. D.,
Plans mildewed, laid in the case,
We looked starvation in the face.
Chorus—
Our good old friend, Ed Kirk, is here,
U. B. D., U. B. D.,
His presence always lends good cheer,
U. B. D., U. B. D.,
And Gindele, too, he shows up bright,
And Gates, who never yet was tight.
Chorus—
Hydraulic pressed brick must be red,
U. B. D., U. B. D.,
For by its use we earn our bread,
U. B. D., U. B. D.,
And the member from the "Fourth" with brains
Will settle all—give him the reins.
Chorus—
We'll drink away till Friday morn,
U. B. D., U. B. D.,
For on that day good luck was shorn,
U. B. D., U. B. D.,
And the architects, their guests to-night,
Keep sober and go home all right.
Chorus—

At the conclusion of this simple ballad there was not a dry guest in the room. Among the guests present were the following: Otto L. Matz, H. W. Huehl, H. M. Hansen, W. L. B. Jenney, W. W. Clay, M. L. Beers, S. M. Randolph, E. M. Newman, R. B. Williamson, J. E. and J. F. Doerr, Frederick Baumann, P. B. Wight, Henry Lord Gay, S. A. Treat, Charles R. Ayars, F. W. Hessesmueller, George Beaumont and R. G. Schmid.

Coincident with the condition which made this reception of more than ordinary interest, the Sunset Club was at dinner in the Palmer House the same evening, for the purpose of discussing the labor situation, and, if possible, to offer a solution. Mr. F. P. Bagley, representing the contractors, presented an able paper, showing the unions in their true light, from the standpoint of one who speaks from experience. That his paper was an able one is attested by the fact of its receiving no notice from the press. The discussions were not altogether beneficial, as no appreciable change in the industrial horizon is noticeable. O. E. Woodberry, representing the carpenters' union, credited to the press and contractors' combinations all of the ills, real and assumed, with which his association contends. He averred that unions were educators to toilers, and the "other fellows" were obstructionists. He made the following statements, which did not appear in the press reports the next morning: "We can't secure legislation to protect us, so we protect ourselves. If we see a "scab" doing work on a building, we go in and give him a punch in the snoot." A very pleasing and effective way of "protecting ourselves," and a typical illustration of the procedure of organized labor. How much longer will the so-called "scab" furnish the punchable "snoot," and the authorities permit the punching?

The Northwestern Terra Cotta Co., one of the largest clay-working concerns in the country, is just now having trouble of its own. For several days their immense plant has been idle, while the workmen indulged in a self-imposed vacation—sometimes called a strike. As usual in such matters, the affair started in a small way over some trivial detail, but once started trouble grew much faster than the proverbial ball of snow. Now the men are demanding an eight-hour day, with nine hours' pay, and threaten all kinds of tribulation if their demands not granted. In the latter event they say they will stop the laying of terra cotta by union workmen. This would bring the other terra cotta manufacturers within the zone of the trouble, so the end is not yet, and very hard to guess.

VERITAS.

Chicago, Dec. 11, 1899.

A Change in Name Only.

The firm of C. W. Raymond & Co., whose ad, we believe, has appeared in every Clay-Worker since our very first issue, is no more, but has been merged into an incorporation, and will be known hereafter as the C. W. Raymond Co. See ad. on page 463. The personnel of the company will remain as heretofore. The only difference in the business will be the addition of more capital and largely increased facilities for carrying on the work, which has grown to immense proportions, and promises to continue to expand, as the demand for Raymond machinery increases with each season.

C. & A. Potts & Co. Win a Patent Suit.

As announced on a following page, the long-drawn-out suit for infringement of patent of clay disintegrator has been decided in favor of C. & A. Potts & Co., of Indianapolis. The case is a notable one, and all parties concerned are doubtless glad that it is ended. Our neighbors have made a brave fight, and are to be congratulated upon a successful issue.

The Newell Crusher and Pulverizer.

The reader who is looking for clay crushing and pulverizing machinery will find a handsome cut of an old favorite on page 472. The Newell Universal mill has been used successfully in many clayworking establishments. The manufacturers have improved it by adding anti-friction bearings, which reduce the power required materially. They will be pleased to tell you all about it. Address the Duplex Heating and Machine Co., Ltd., 534 West Twenty-second street, New York city.

TRADE LITERATURE.

WE ARE INDEBTED to the American Blower Co., Detroit, for a copy of their illustrated sectional catalogue No. 110. It is beautifully printed, and the cover is a rich red, with title embossed in black. There is an entertaining dissertation on the importance of properly heating and ventilating schools, factories, etc., followed by descriptive matter and illustrations of their fans and heaters, which show a remarkable degree of perfection. One of the prettiest of the illustrations is a view of a typical English brick dryer. Those who are interested in ventilating and drying problems are requested to write them for a copy.

"HOLLOW BUILDING BLOCK; Their Manufacture and Use, Past, Present and Future," is the title of a handsome illustrated book recently received from the American Clay Working Machinery Co. The main portion of the book, as stated in the introductory, consists of a series of articles originally prepared for The Clay-Worker by E. G. Durant, who is certainly the best authority on the subject of hollow block construction in the country. He has elaborated his original paper somewhat, and a large number of excellent engravings have been added to the illustrations, making a very handsome book that any clayworker may be proud to add to his library. The selling price of the book, in paper covers, is $1. For copies address The American Clay Working Machinery Co., Bucyrus, O.

TRADE NOTES

S. A. Bumgarner, Paola, Kan., writes that he is in the market for a good second-hand repress.

We are advised by E. L. White that he is going into the brick business at Victor, Col., and is in the market for brick machinery and appliances.

Alexander Jones, of the Chicago Drainage Canal Committee, Chicago, Ill., has purchased the Privett brickyard, at Anderson, Ind., and will operate same in the spring.

George T. Whitmore and Charles H. Palmer, of Akron, O., will form a stock company and erect a plant for the purpose of manufacturing sewer pipe. The plant will be located at Mogadore, O.

The Mulligan Steam Brick and Manufacturing Co. has been chartered to make brick at Vicksburg, Miss. John J., J. H. and E. F. Mulligan and T. R. Foster are interested. They have a capital stock of $100,000.

The brickyard of George Cowden, at Lancaster, O., was almost totally destroyed by fire early in the morning of the 8th inst. Mr. Cowden will rebuild on an improved and enlarged scale. The work on the new factory will begin at once.

G. W. Burlingame, of Yuma, Mich., writes that he has leased the brickyard of Mrs. E. S. Oldfield at Oldfield, Va. Mr. Burlingame says he has been out of the business for seven years, but thinks the prospects are bright for a good season at Oldfield next year.

The Stiles & Hart Brick Co. has been incorporated by Frank L. Stiles, E. G. Stoddard and John W. Bristol, of New Haven, Conn., and Mr. Hart, of Taunton, Mass. The new company will absorb the business of the Hart Brick Co., at Taunton, Mass., and will use the the old factory there, but have offices in New Haven, Conn.

F. H. Eggers, whose brick plant at Cleveland, O., was destroyed by fire some time ago, has purchased 35 acres of land at South Brooklyn, a suburb of Cleveland, on which he will erect one of the finest brickyards in the country. Mr. Eggers says the plant will be equipped with modern machinery and have an ultimate capacity of 100,000 brick a day.

The Adrian Brick and Tile Machine Co., Adrian, Mich., wish to direct attention to the combined brick and tile machine shown on page 472. This outfit they consider one of the best on the market, and will very gladly give a reason for the faith within them, and a full description of this or any other machine wanted, to any of our readers who are sufficiently interested to drop them a postal card.

Plumridge & McNeil Supply Company is the name of a new company composed of T. P. Plumridge, president, and George C. McNeil, secretary and treasurer, which will undoubtedly get its full share of trade the coming season, for the senior member of the firm is an experienced and very successful salesman. He was connected with the Hydraulic Press Brick Co. for a number of years, and more recently with Evens & Howard. He is thoroughly familiar with every detail of the business. Mr. McNeil is a native of St. Louis, where he has hosts of friends, and is a good all around business man. They have purchased the Newbern Brick Works at Newbern, Ill., and will put it in thorough repair, so as to get an early start in the spring. The have cosy offices in the Chemical building, where visiting brickmakers will always be welcome.

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Books for...

Brickmakers.

"CLAY GLAZES AND ENAMELS," Henry R. Griffen, C. E. $ 5.00
"BRICKMAKER'S MANUAL," Morrison and Reep, 3.00
"BRICKMAKING AND BURNING," J. W. Crary, Sr., 2.50
"TABLE OF ANALYSES OF CLAYS," Alfred Crossley, 1.00
"VITRIFIED PAVING BRICK," H. A. Wheeler, E. M., 1.00
"PRACTICAL FARM DRAINAGE," J. J. W. Billingsley, 1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

RAYMOND

BRICK MACHINERY

Where it is Used.

In answer to many inquiries as to where our Machinery can be seen in operation, we submit the above diagram.

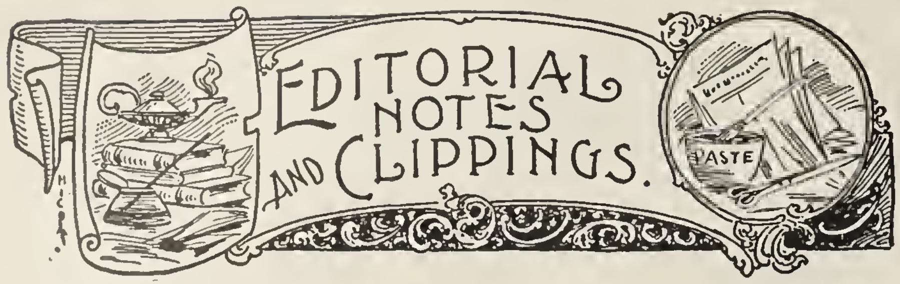
RAYMOND BRICK MACHINERY is now used and in daily operation the world over. ☙ Place your finger on the map and you are almost sure to place it upon a Raymond Brick Machine. ☙☙

Our great success has not been obtained without merit. ☙☙ Buy Raymond's and you get the best.

☙

The C. W. RAYMOND CO.

DAYTON, OHIO, U. S. A.



EDITORIAL NOTES AND CLIPPINGS.

J. H. Young, Wise, Va., is in the market for brickmaking machinery.

S. Wingo, formerly of Centralia, Mo., will manufacture brick at Columbia, Mo.

H. D. Haskins writes that he contemplates embarking in the brick business at Lake Geneva, Wis.

Max Stock, a contractor of St. Joseph, Mich., will start a brickyard at that place early in the spring.

The Chicago Brick Co. will erect a new brick plant at Rawlins, Wyo., where there is a good deposit of fire clay.

McGrath Bros., Demapolis, Ala., write that they are in the market for a good second-hand Sword brick machine.

The plant of the Commonwealth Brick Co., East Brookfield, Mass., was damaged to the extent of $500 by fire recently.

Goodwin & Meyer, Redfield, Ia., advise us that they want to purchase a second-hand four-mold dry press. Must be in good condition.

Robert McCartney has leased the Gladman brickyard at Maryville, Miss., and will put the same in shape for operation in the spring.

F. H. Burgenheimer will operate a brickyard at Mandan, N. D., next spring. He says his plant will be up to date in every particular.

The Strongville (O.) Brick Co. has been incorporated, with $25,000 capital. The works will be at Strongville, with the office in Cleveland, O.

T. B. Williams, of the Morgantown (W. Va.) Brick Co., has organized a company, and will locate a large brick plant at Colfax, near Fairmount, Md.

Ferris Brick Company is the name of a new concern that has been incorporated at Mechanicsville, N. Y. J. C. Duncan, F. H. Ferris and others are interested.

Smith & Son, of North English, Ia., will purchase the Hawarden, Ia., brick plant. They will remodel the plant during the winter, so as to be ready for the spring trade.

Charles L. Ross, Waynesburg, Pa., writes that he is in the market for a 25 to 30-horse-power engine and boiler. He prefers either an Atlas or Chandler & Taylor engine.

The Campbell (Fla.) Brick Co. has just closed a contract with the Gainesville & Gulf Railway to furnish them 1,500,000 brick to be used in the construction of a large depot.

The Monroe Brothers Brick Co. has been chartered to manufacture brick at Alexandria, Va. C. R. Monroe, of Washington, D. C., is president. The company has a capital of $10,000.

John C. Vanatta, of St. Joseph, Mo., has leased for three years a brickyard at Trenton, Mo. He will put in machinery and get the plant in shape to manufacture brick in the spring.

S. D. Corwin intends to enlarge his tile plant at Caledonia, O., by the addition of a large brick building and another kiln. With these improvements he will be able to make brick all the year.

Mr. A. G. Collom, of Germantown, Philadelphia, is finishing up the year with ten million soft-mud sand-faced brick to his credit, all made on one Martin Style "A" steam-power machine.

The new tile and pressed brick factory which is being erected in Durango by Don Carlos Bracho, president of the Bank of Durango, is almost completed, and will soon be in operation. It is a very extensive plant, and will have a capacity of 30,000 pressed brick daily. The factory is located near the Mexican International Depot, and a side track, 800 feet in length, has been built to connect it with the main line.

T. J. Toler and W. P. Dunn has dissolved partnership in the brick business at Crowley, La. G. W. Toler has purchased Mr. Dunn's interest, while the latter will remain as superintendent.

The death of Louis N. Cox, a well-known retired brick manufacturer of Wilmington, Del., occurred Dec. 10. Mr. Cox was seventy-six years old, and had retired from active business but a few years ago.

George Bratcowski, an employe at Matthiessen & Hugeler's pottery, La Salle, Ill., sustained serious injuries by falling headlong down an elevator shaft. He is fifty-six years old and a man of family.

The Orangedale Brick and Trading Co., composed of parties from Halifax, N. S., are starting a large brick plant at Orangedale, Cape Breton Island. They expect to be ready for operation in the early spring.

F. A. Stephenson, of Webster City, Ia., has purchased a tract of land from O. T. Denison, the well-known brick manufacturer of Mason City, Ia., on which he will at once erect an up-to-date brick and tile factory.

Willey & Smith, Taylorville, Ill., advise us that they expect to put in stiff-mud brick and tile machinery, and therefore desire to receive catalogues, price lists, etc., from manufacturers of stiff-mud machinery.

The brick works at Pugwash, N. B., of which Robert Brownell is president, and H. E. Arnold secretary, are being improved by the building of a number of new kilns. This will enable them to keep busy all winter.

Smith Bros., of Ash Grove, Ill., have purchased the tile factory of C. H. Wessells, at Crescent City, Ill. They will not take possession until Feb. 1. Mr. Wessells will move to Arkansas, where he will engage in stock raising.

The Midland Brick and Terra Cotta Lumber Co. has been incorporated at Wheeling, W. Va., by Charles W. Franzheim, J. N. Vance, Wynn Hubbard, John M. Birch and M. L. Ott, all of Wheeling, and James Ponce, of Wellsburg.

J. H. Guise writes that his yard at Williamsport, Pa., is in full blast again, working night and day on the Guise block. They are now busy on a large order that goes to Washington, D. C. The plant will be operated fullhanded all winter.

Thomas Trainor, for seven years superitendent of the Turner (Ill.) Brick Co., has severed his connection with that company and come over into Hoosier land to take a similar position with the Cayuga Pressed Brick Co., Cayuga, Ind.

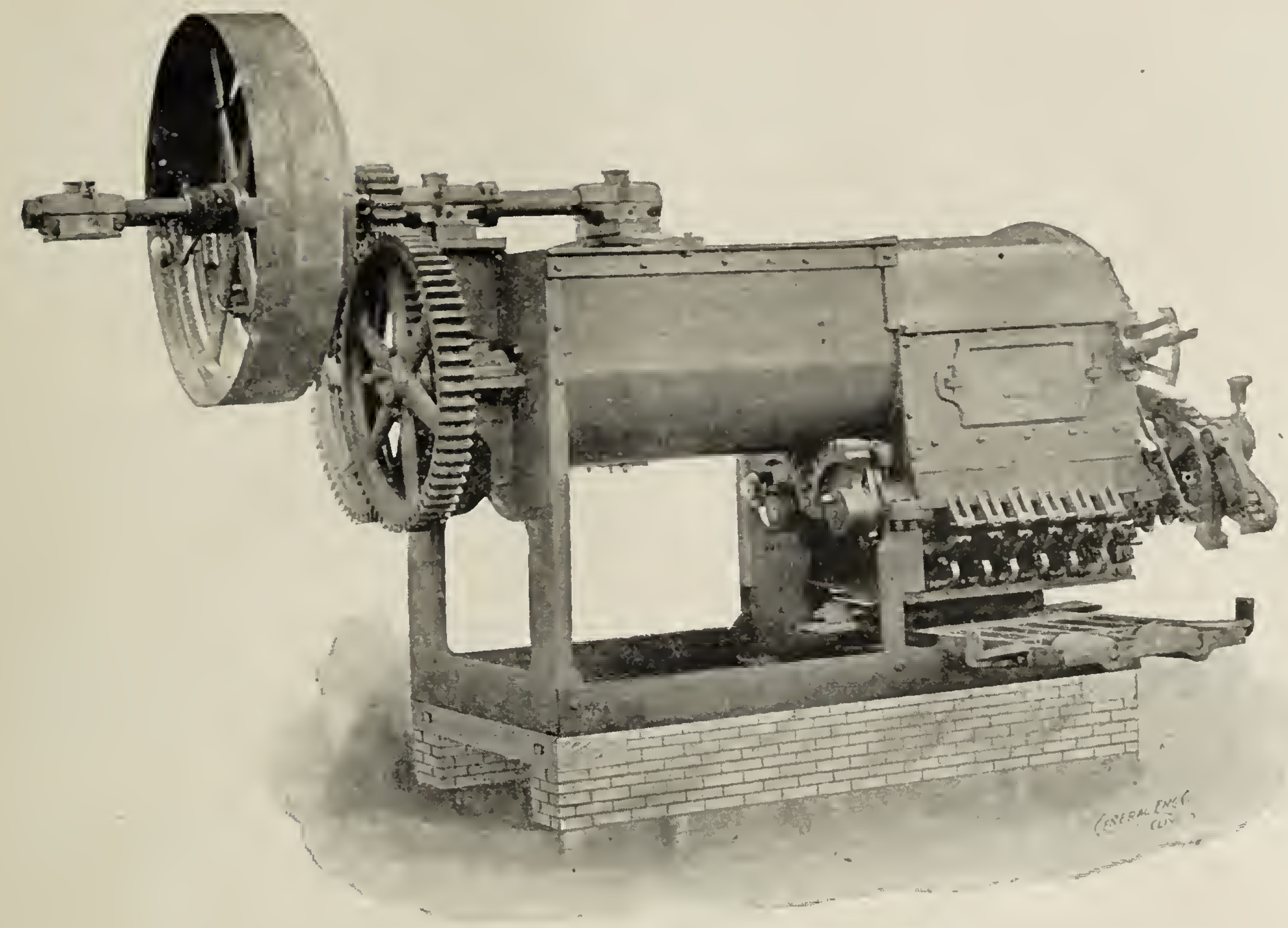
Charles Parker, who operates the brick plant of the Camp Manufacturing Co., at Franklin, Va., in a recent letter renewing subscription, says he has had an unusually prosperous season, and has bright prospects for a still better one next year.

L. C. Turley, vice president of the Kentucky Fire Brick Works, Kentucky, writes that they desire to purchase a good second-hand wet pan for grinding fire clay. They are not particular as to whether the pan has a wooden or iron frame.

George D. McDaniel has purchased six acres of ground adjoining his brickyard at Springfield, Mo., and will enlarge the plant so as to be able to turn out 40,000 brick daily. He manufactured 1,300,000 this season, and wants to double that number next year.

Robert Goodwin, secretary of the Iowa Brick and Tile Association, of the Dale-Goodwin Brick Co., of Des Moines, Ia., has comemnced suit in the U. S. Court against the Chicago, Milwaukee & St. Paul Railroad Company for $10,000 damages for personal injuries. He says that on Oct. 2 last he took a Milwaukee train to go to Redfield, Mass., where he has a brick plant, and

[CONTINUED ON PAGE 466.]



Over 75 "Monarch" Brick Machines In use.

Double Pug-Mills and Double Presses giving far the most Tempering and Pressing Capacity.

Over 500 "Quakers" in use Both Horse and Steam Power, now made entirely of Iron and Steel.

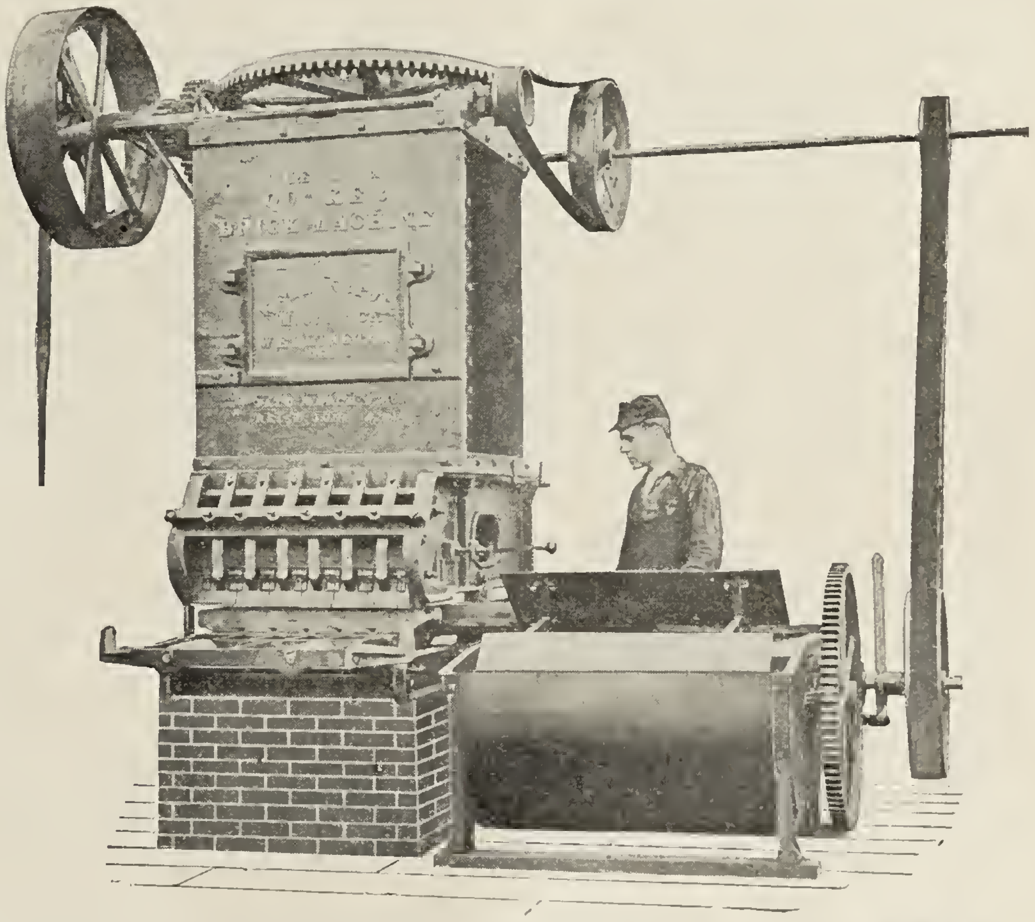
Long acknowledged the best for small and average sized yards.

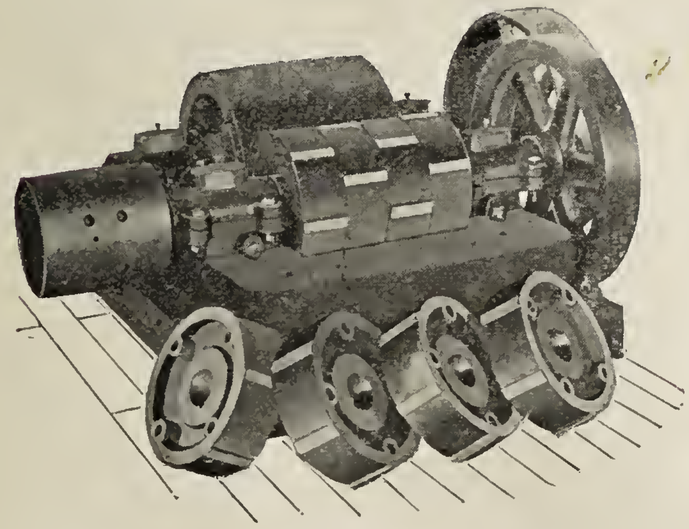
FOR 1900

We have added several new machines to our line.

Send for our 1900 Circulars.

Our mould-sander is the best, simplest and cheapest.

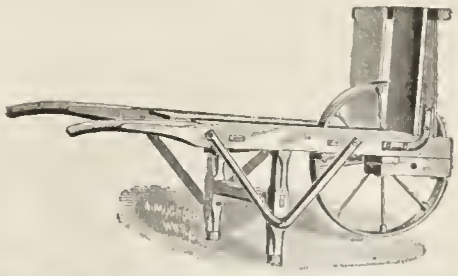


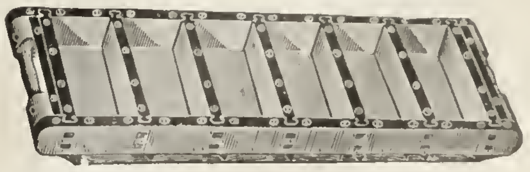


TWO Styles of Disintegrators, Solid rolls with inserted cutting bars and cutting roll made of hard sections.

MOULDS, TRUCKS, BARROWS,
and all other Supplies.

Nothing runs easier than our BALL-BEARING BARROWS AND TRUCKS.





The WELLINGTON MACHINE CO.,
WELLINGTON, OHIO.

EDITORIAL NOTES AND CLIPPINGS—Continued.

that he was sitting with his hand over the window sill, when the window fell and caught his hand in such a way that one of his fingers was cut off and the hand greatly bruised.

R. A. Eaton is secretary of a terra cotta firm that desires to locate near Buffalo, N. Y. Any one in that locality who owns good shale or clay deposits can get information in regard to the plant by addressing Mr. Eaton, 69 Chapin block, Buffalo, N. Y.

The brickmakers of Texas have been doing their full share of business during the past season. A notable instance is that of the Kennedale (Tex.) brick works. Some weeks ago they had passed the two-million mark, and are still in operation, with bright prospects for a busy year ahead of them.

W. C. and G. W. Stone, of Linden, Mich., have purchased ten and a half acres of land at Durand, Mich., on which they will erect a modern plant for the manufacture of both brick and tile. Ground has already been broken, and the plant will be pushed to completion as rapidly as possible.

Wm. Taylor & Son, Carleton Place, Ontario, Canada, write that they desire to correspond with some one who can advise them in regard to remodeling their yard. They manufacture by the soft-mud process, and have attempted repressing the brick, but with indifferent success. Parties can address them direct.

William Jennings and C. W. Lynch have purchased the brick plant of John K. May at Harrisburg, Pa. The above named gentlemen are interested in a company that purpose building two hundred houses at Harrisburg, Pa., for which Jennings & Lynch will furnish the brick.

In a recent letter inclosing subscription to The Clay-Worker, J. M. Elkins, Granby, Quebec, says he desires information in regard to the best brick machine for soft-mud brick. He is also investigating steam dryers, and will be glad to hear from both machine and dryer men.

George Fricke, a well-known brick manufacturer of Manitowoc, Wis., died at his home, Dec. 2. Some time ago he sustained a fracture of one of his limbs by the caving in of a clay bank. The limb seemed to be mending, when he was taken with congestion of the brain, which proved fatal.

C. J. Monroe, superintendent of R. B. Shelton's brick plant at Covington, Tenn., writes that they have had a very busy season. A large cotton factory is being built at Covington that is taking a great many of their brick, which are made on a Freese machine.

The largest shipments of brick machinery to Europe by the Henry Martin Brick Machine Manufacturing Company, of Lancaster, Pa., have been made during the past year, exceeding any export business this well-known firm has had during its existence of nearly fifty years.

William F. Head, for many years a brick manufacturer of Hookset, N. H., died Dec. 8. He was senior member of the brick firm of W. F. Head & Son, and of Head & Dowst, contractors, and was interested in two of the city banks and a railroad, besides taking an active part in State and local politics.

The Dunbar (Pa.) Fire Brick Co., at Peachin Station, was completely destroyed by fire Nov. 12. The plant had recently been remodeled at an outlay of several thousand dollars. John Palmer, of Hazelwood, Pa., is president of the company. The plant will probably be rebuilt. The origin of the fire is not known.

A stock company, to be known as the Coffeyville Pottery and Clay Manufacturing Co., has been organized and chartered, and will take charge of the pottery at Coffeyville, Kan. The company has a paid-up capital of $6,000, and its officers are Dr. W. C. Hall, president; Ed S. Rea, secretary and treasurer; J. S. Browne, manager. Dr. W. T. Shipp is also a stockholder. The first move the new company will make will be the enlargement of the plant's capacity. It now makes 5,000 gallons of ware per week, and hereafter it will make 10,000 gallons. This is one of the few potteries in Kansas, and it uses natural gas for fuel, making an exceptionally fine quality of ware. The institution has proven a money-maker, and its enlarged capacity will be beneficial to itself and to Coffeyville.

Richard Murray sustained a loss of $1,200 by fire at his brickyard at Berlin, Conn. Mr. Murray is inclined to think the fire was caused by incendiaries, as one of his barns was fired a short time since. The loss is fully covered by insurance.

The plant of the Des Moines (Iowa) Brick and Manufacturing Co., which was destroyed by fire early in the year, will be rebuilt. This new plant will be superior in many respects to the old one, and will have a large capacity. They expect to be in operation early next season.

The Knowles, Taylor & Anderson Sewer Pipe Co., of East Liverpool, O., received an order recently from Bombay, India, for seventy-five carloads of sewer pipe. The pipe will be used to sewer the streets of Allahabad, a town situated in the northwest province of India, near the holy city of Penares. The order is worth $5,000.

A new organization has been chartered to manufacture paving brick at Mechanicsville, N. Y. The following officers have been elected: President, W. R. Palmer; vice president and general manager, F. H. Ferris; secretary, N. T. Bryan; treasurer, W. L. Howland. They have an excellent site for the new plant, on which there is an abundant quantity of good clay.

A new manufacturing concern has been organized at Macon, Ga., by W. A. Jeter, Peter Harris and C. D. Hurt. The promoters have purchased two hundred acres of land near Macon, on which they will erect a plant for the manufacture of all kinds of building brick, tiling and clay pipes. The new company is capitalized at $1,000,000, of which $200,000 has been paid in.

John T. Soisson, treasurer of the Soisson Fire Brick Co., Connellsville, Pa., died quite suddenly at the Bingham Hotel, Philadelphia, Pa., where he had gone on a business trip. Mr. Soisson was forty-three years old, and one of the most active business men of Connellsville, being interested in many of the industries of the town. A wife, three daughters and one son survive him.

A peculiar accident occurred at the Buckeye Brick Works, Wellsville, O., recently, which resulted in painful injuries to three of the employes. They had opened up a kiln of brick that had just been burned and had removed but a few when the crown of the kiln fell in on them, and, as the brick were still warm, the men were quite badly burned, in addition to being bruised.

Ground has been broken for a large brick plant which will be erected on the property of the Stockyards Company, South Omaha, Neb. Mr. August Stutzer, who will be superintendent of the plant, has charge of the construction of the works, which will be modern and up-to-date in every particular. They intend to burn with oil. The firm will be known as the Nebraska Brick Co.

The Philadelphia Clay Manufacturing Co., with a plant at Hunters' Run, Pa., has recently been incorporated, with a capital of $1,000,000. The following officers were elected: President, M. W. Phillips, Philadelphia; treasurer, J. S. Brailey, jr., Wauseon, O.; secretary, D. S. Sadler, Carlisle. The Board of Directors are M. W. Phelps, Philadelphia; P. W. Adler, Philadelphia; H. W. Wood, Piqua, O.; J. K. Duffy, New York; J. S. Brailey, Wauseon, O., and L. S. Sadler, Carlisle.

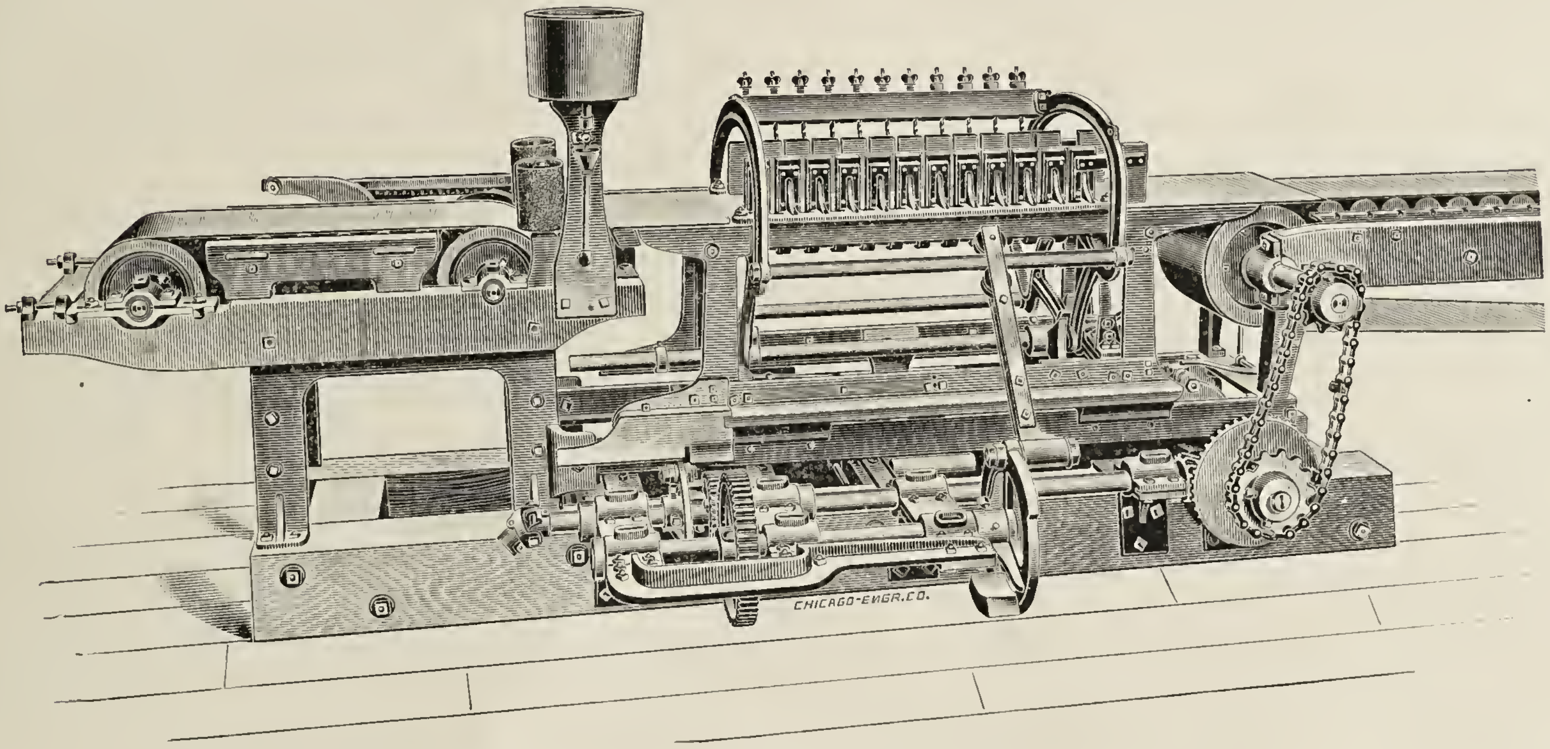
W. S. Purington, vice president and general manager of the Purington Paving Brick Co., Galesburg, Ill., writes that as usual they are very busy. In addition to their regular business they are making a number of changes at their immense plant, especially in the dryers. They are also building coal furnaces.

CONTINUED ON PAGE 468.

AN OPPORTUNITY.

We have such confidence in our No. 60 automatic side cutter (illustration herewith) that we will send it to any responsible brickmaker and guarantee

SATISFACTION OR NO SALE.


CHICAGO-ENGR.CO.

No. 60 Automatic Brick Cutter.

YOU TO BE THE JUDGE.

If you want an automatic cutter and do not avail yourself of this chance to see and try before you buy

YOU MAKE A MISTAKE.

Full information about this cutter or anything else in the line of clay working machinery furnished gladly upon request.

H. BREWER & CO.,
TECUMSEH, MICH., U. S. A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

Mr. Purington has recently returned from a trip among the paving brick plants of the East. He says he found every one busy and looking forward to the coming convention at Detroit, so that he predicts a large attendance at that meeting.

J. A. Reep, general agent for Morrison's improved brick kiln, has just completed and burned one of their largest sized Morrison kilns, on the yard of W. A. Roberts, at Chalker, Ga. The kiln is twenty-nine feet wide by seventy feet long, inside measurement, and has a capacity of nearly 400,000 brick. Mr. Roberts has been pushing his work all summer in an effort to keep up with the demand for brick. Part of the time he run his works night and day. He has been making some extensive improvements, with others contemplated in the near future. He is still at work, and expects to make brick until near Christmas. The night of Nov. 10 he sustained a heavy loss in the burning of his commissary store, together with his shop and all his tools and supplies; also all his books, papers, accounts, etc., together with a file of Clay-Workers reaching back for several years, and by which he set great store. No insurance. He intends to rebuild his commissary at once, and will enlarge it, building it of brick, as a brickmaker should.

A MEMORANDUM BOOK FREE.

We have issued for the clay trade a vest-pocket memorandum book and atlas combined. The book is similar to the one we issued last year. It contains room for memoranda each day of the year, gives a list of holidays, the population of all towns in the United States, Cuba and Alaska, together with location, in what country and on what railroad; maps of the United State, Alaska, Cuba and Greater New York. Also contains information on foreign and domestic postage, and rules governing international revenue stamps, and tells the amount of revenue stamps necessary on various documents, as well as much other useful information. If you are the owner of a clayworking plant you can have one of these books free if you will write for it. They cost 25 cents at the stationery stores, and are worth it. We give them to you free. In writing give your own name and address, and state what the outlook for the coming season is. Also give the names of any other owners of brick or tileyards in your vicinity. Don't forget to say that you saw this notice in The Clay-Worker. Address The American Clayworking Machinery Company, Bucyrus, O.

THE HUDSON RIVER BRICKMAKERS CONSOLIDATE.

The American Brick Co., New York City, have issued a prospectus giving the names of its officers and the plants along the Hudson river which have been purchased. The officers are Oakleigh Thorne, president; Robin Main, vice president; Edwin Thorne, secretary and treasurer. The directors are Samuel Thorne, president of the Pennsylvania Coal Co.; Grant B. Schley, of Moore & Schley; D. S. Lamont, vice president of the Northern Pacific; R. Sumner Hayes, president of the St. Paul & Duluth railroad; Oakleigh Thorne, Edward Thorne, Aaron E. Aldridge and Robin Main. The following companies have been absorbed by this new company: Sutton & Sudderly, Corwin & McCullough, Coeymans; Van Deusen, Washburn Bros., McGinnis, Brosseaua, Cooney, Corse, Lent, Glasco; Turner Bros., Klein Bros., Port Ewen; Fitzgerald, Coxsackie; Rider, Athens; Walsh Bros., Stockport; A. Frost, A. Belford, George Island; Charles Shultz, E. S. Staples, Terry Bros., Streeter & Hendricks, Hutton Brick Co., F. Fredericks, Robin Main, A. Rose & Co., U. F. & J. T. Washburn, H. Bringham, Rondout; Bartlett Brick Co., Hudson; Feller & Golden, Washburn & Barnes, Catskill; Jova, Rose Brick Co., Rosetown; Brockway, Verplank, Hunt Estate, Mead, Fishkill; Tompkins, Mrs. Reid, Lillburn, James Gillis, De Noyles, B. J. Allison, Palmer, Warrel & Washburn, Washburn & Fowler, Felter Bros., Mrs. Scott, Peck Estate, Archer Estate, Snedeker Bros., Eckerson, Excelsior B. Co., D. Fowler & Son, Gardner Estate, Haverstraw; Mrs. Walsh, M. Lahey, H. Davidson, New Windsor; Ramsdell Estate, W. D. Budd Estate, Aldridge Estate, Gurnee estate, F. Timony, Dutchess Junction; Hedges Bros., Cornwall; Underhill Estate, Hamilton Estate, Croton Point; Hudson River B. Co., Bonner B. Co., Peekskill.

RAILROAD MAKES ITS OWN FIRE BRICK.

THE SOUTHERN PACIFIC COMPANY operates a very interesting fire brick plant in conection with its shops and works at Sacramento. All of the brick for the fire brick arches in the 750 locomotives in the company's service is manufactured at this place. Owing to the great heat maintained in the fire box of the engine, the brick arch lasts only few days; that is, from fourteen to twenty days, according to the work performed by the machine. The arch, which is kept at an intense heat, is for the purpose of consuming the gases arising from the coal in order to prevent black smoke from being thrown from the stack, besides otherwise saving the locomotive's wear and tear. The clay is quarried at Lincoln, Cal., and the analysis shows combined water 9.6 per cent., free silica or sand 24 per cent., combined silica 34.2 per cent., alumina 28.8 per cent., iron oxide 3.4 per cent. There is no alkali, lime or magnesia. This clay, however, is not used in its original pure form in the manufacture of the fire brick, as the latter is made up of two-thirds of old fire brick reground and one-third of new clay.

Each division master mechanic ships all of the old material back to Sacramento, where it is reground, and, with a percentage of the new clay, is remolded into new brick. The company makes all of this by hand, and, although the method is quite primitive, at the same time it is effective, and the work is performed in a most highly satisfactory manner. The clay is picked out of the stirrers and from there thrown into the moulds, instead of being rolled out as in other plants.

The company once tried having the brick made by a brick company, but somehow or other the results were not up to the standard, as the brick would flake off in layers. The theory is that the rolling of the clay was responsible for this fault, as the same material made by hand does not cause any trouble whatever, and no crumbling or flaking is perceptible. A great many thousand bricks are turned out each month for the great army of locomotives, and each is five inches thick and ten inches long, and somewhat curved in order to form an arch.

SUNSET.

For cheap machinery the reader is referred to our For Sale columns. We do not advise the purchase of cheap machinery. As a rule cheap machinery is dear in the end, but for some places second-hand machinery answers a very good purpose. Those wanting experienced help will also find the Wanted, For Sale, etc., columns a means of satisfying their needs.

PUZZLE.

What did Johnnie get for his birthday?

in Judge

NOTICE.

* * * *

After nearly eleven years of litigation, during which time the case has been before the Supreme Court of the United States twice, our

Clay Disintegrator Patent

has been adjudged by the United States Circuit Court of Appeals for the Sixth Circuit to be valid and infringed.

We call attention to the following extracts from the opinion of the Court:

We do not find from the evidence that the operation of any of these (older) machines for the disintegration of clay was so successful as to lead to their general adoption by the trade or to work a change in the older and more laborious methods in preparing clay for brick machines, graphically described by Mr. Justice Brown in his opinion.

It is clearly established by the evidence that the Potts Machine is a success.

Nearly all the witnesses who testified to the contrary are prejudiced by their general interest in the litigation, and, **as infringers of complaint's patents,** are contradicted by their conduct. The weight of such evidence, moreover, is much impaired by the trade circulars issued by defendants, showing the success of machines which **infringe** and **Resemble, in every way,** the Potts machine. The operation of the Potts machine described by **Mr. Justice Brown** shows that **it embraces the rapid revolution of the cylinder with longitudinal blades upon it, arranged with reference to the mass of clay to be disintegrated, so that the knives upon the surface of the cylinder shall strike with hard blows the mass of clay and clip off or tear off from the mass presented to the cylinder bits of clay and carry them into receptacle below.**

☞Our rights having now been confirmed, both by the Supreme Court of the United States, and by the Circuit Court of Appeals for the Sixth Circuit, all persons are hereby notified that we shall expect said rights to be respected, and that all infringements will be promptly and vigorously prosecuted.

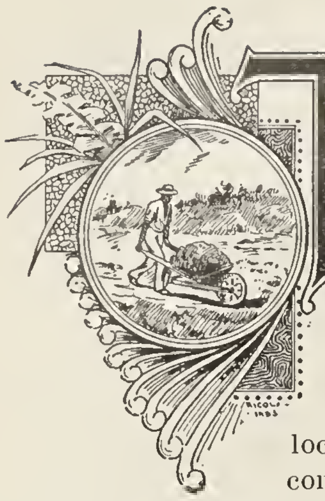
Persons owning or operating infringing machines, which they have bought heretofore, will advance their own interests by promptly settling with us.

* * * *

C. & A. POTTS & CO.,

Indianapolis, Ind.

PACIFIC COAST NEWS.



THE BRICK and clayworking field presents rather a quiet appearance just now, but those who are engaged in this business do not seem to feel any apprehensions for the future, as they claim that the prospects are better than they have been for several years past, especially as rain has fallen in large quantities throughout the greater part of California and the Pacific coast.

The principal work going on with the local dealers this month is confined to small contracts, with a few exceptions. Among the latter might be mentioned the sewer pipe contract recently secured by N. Clarke & Sons, from the town of Watsonville, Cal., which is to have a new sewer system. This work requires about $18,000 worth of material, and the firm in question is now preparing to deliver the same. These people are also putting in about $2,000 worth of terra cotta work on the Murphy building, now in course of construction, on the corner of Kearny and California streets, in San Francisco. General business with Clarke & Sons is reported to be in very good shape.

The Steiger Terra Cotta & Pottery Works are putting in about $2,000 worth of terra cotta work on the Coleman building, on Third street, near Market.

P. Fitzgerald, who owns a bed of fire clay located on the line of the Spokane Falls & Northern Railway, a few miles south of Northport, Wash., has just returned to that city from a trip to British Columbia points, where he has been successful in obtaining a number of large orders for his product. He has also just received an order from the Northport Smelter to supply them with a considerable quantity. Mr. Fitzgerald will put a crew of men at work at once to fill the orders, and has no doubt but he will succeed in developing a successful enterprise.

C. E. Grouard reports a successful run of business at his brickmaking establishment in Santa Ana, Cal. The output from this yard this season has been about 1,600,000 brick.

The Newburg Pressed Brick Company, of Newberg, Ore., has received word from the contractors on the custom house at Portland that some 25,000 brick more than the first contract called for will be required to finish the building.

J. H. Miller & Sons, of New Whatcom, Wash., are burning a kiln of brick containing 250,000. They recently burned a kiln containing 550,000, which is probably one of the largest ever burned in that part of the country.

Mr. Robert Krugel, the Vineland brick burner, has opened up a lime kiln just above Concord, Wash.

Clay suitable for making a very high class of pressed brick, terra cotta and earthenware has been discovered near Salmo, B. C., and a company is being formed to work it on a large scale.

Near Benson, Ariz., are deposits of a peculiar fire clay that have for years been drawn upon for lining the converters at the Bisbee smelters. It has been found that the clay is practically identical with that from which is manufactured the celebrated Guadalajara ware. J. M. Castanada has imported workmen and artists from Mexico, and is now producing statuettes and earthenware declared fully equal to the best of Guadalajara.

The Safford Construction Company, of Safford, Ariz., have about completed arrangements to begin the burning of a kiln of brick. Barney Harmson is the manager of the company.

Probably no building season has added so much to the appearance of Spokane, Wash., as the one just ended, unless it was the year after the fire. The most noticeable fact about the building this year is the development in the residence district and the elaborate plans drawn for new business blocks. The local mills and brickyards have been taxed to their utmost to meet the calls for building material. The supply of red repressed brick is said to be completely exhausted. There are not more than 15,000 to 20,000 of this class of brick in Spokane, and these have been contracted for. The Washington Brick & Lime Company is now building sheds at its Cannon Hill yards, and expects to employ a force there all winter making common brick. They also have a supply of cream pressed brick on hand, and will work their Clayton yard all winter. so as to be ready for the spring demand and to fill any late orders.

The Enterprise Clay Company, of Ogden, Utah, has been reorganized. The old board of directors, consisting of John S. Smith, A. A. Wenger, M. Butcher, William Richardson and L. J. Butcher, resigned. Mr. Smith and Mr. Wenger were reelected, and Robert B. Lewis, Paul W. Stecher and John S. Lewis were also placed on the new board. The newly elected officers are John S. Smith, president; A. A. Wenger, vice president; Robert B. Lewis, secretary; Paul W. Stecher, treasurer. Archie V. McIntosh is interested in the new company, and will be its bookkeeper. The capital stock of the company has been increased from $15,000 to $30,000. Valuable clay deposits have been purchased at Millis, Wyo. Work on a large scale is to be pushed, as the factory is overcrowded with orders for its products.

George Holcomb, one of the owners of the kaolin deposit on El Cajon mountain, Cal., has returned to San Diego from East Liverpool., the pottery center, where he displayed the kaolin, and it attracted much attention. He says the result may be the establishment of a pottery at San Diego, Cal.

George B. Marsh has leased a tract of clay land on the flat near Nogales, Ariz., and has started a new brickyard.

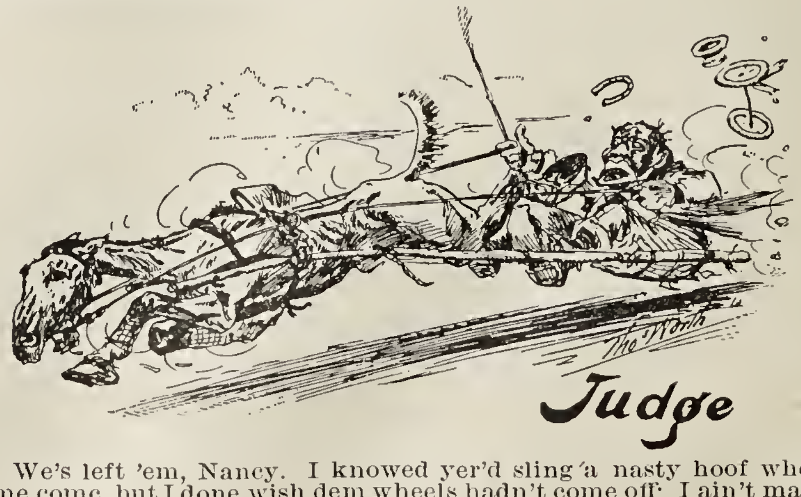
Considerable brick is being shipped at present from the Weston, Ore., yard. One order is from the O. R. & N. Co., and includes 25,000 brick for Wallula, 25,000 for Grange City, and 8,000 for Colfax, all in Oregon. Another 25,000 is being shipped to Walla Walla, Wash.

The Federated Trades Council, at Portland, Ore., is at present busy with the question af Japanese labor in brickyards. It is doing everything in its power to induce a brickmaker in South Portland to replace the "Japs" he lately hired with white men. In his case it would not make so much difference, but as competition with him will force all other brickyard men to do the same, the question is a serious one with the trades. Should Japanese be employed in all the brickyards, it means that quite an army of men will be thrown out of employment and that more Japanese will be imported into the country.

San Francisco, Cal., Dec. 5. SUNSET.

MR. POMPEY ON NEW YORK'S SPEEDWAY.

"Now, den, Nancy, I'se gwine ter call on yer. I hear some ob dem millioniares comin' up."



We's left 'em, Nancy. I knowed yer'd sling a nasty hoof when de time come, but I done wish dem wheels hadn't come off. I ain't macadamized myself, and dis road is turrible hard."

The Key to Success.

THE KEY to the present trade situation is told in the one word CAPACITY. The demand for all kinds of machinery and products is unprecented, and every pregressive manufacturer is now studying to enlarge his output. Clay-workers have a very busy year ahead of them. It will pay every brick and tilemaker to put his plant in shape to obtain the largest possible capacity.

One sure way to increase the capacity of a good many plants is to put in improved machinery for preparing the clay. The capacity of brick machinery is always greater when the clay is properly pulverized and tempered before it reaches the machine. The very best machines for this purpose are the

Williams Shale Pulverizers and the Williams Clay Crushers.

These machines are guaranteed to double the output of any dry pan by using one of them ahead of the pan, or by the use of one of their **Tailings Pulverizers** after the pan, they guarantee to double the output.

These machines are now in use on many of the largest plants in the country. They are noted for **Large Capacity, Easy Running, Strength and Durability.** They will pulverize anything pulverizable. They do the work thoroughly and with the least power possible.

If you want the very **BEST** Clay and Shale Pulverizer on the market, don't fail to write us for further particulars.

The Williams Patent Crusher and Pulverizer Co.,

2701, 2703, 2705 and 2707 North Broadway,

ST. LOUIS, MO., U. S. A.

Mention the CLAY-WORKER.

Branch Offices:
NEW YORK OFFICE: Washington Life Bldg.
PHILADELPHIA OFFICE: Stephen Girard Bldg.
WEST VIRGINIA OFFICE: Bramwell.
LOUISVILLE OFFICE: 1301 West Main Street

Written for The Clay-Worker.

THE NEW YORK BRICK MARKET.

THE WEATHER is all that can be desired for this time of the year, and no doubt the men who are around the last kiln are thankful for it, as it is far from pleasant to be nearly frozen, as well as smoked, to death in starting the kiln. And the finishing up, when the heat is all on top! None but those who have been around a kiln of brick know of the discomforts.

Is the end in sight for such low rates as have prevailed for some years, and more especially the past season, with the demand being equal to the supply? Before this reaches your readers the American Brick Company will be in possession of all property that it has had an option on, as the time set to take charge was the 1st of December. It would be a rash prediction to make at this time that it would work along as in times past, as the parties who have taken hold are in to make money, and they will no doubt try from the start to make it pay. If they can control—as it is admitted they can—50 per cent. of the product, it certainly means a higher rate, as they will regulate shipments. Will they do this and let the others ship? I think not. They will no doubt expect the free yards to help hold. If not, the coming season will see brick sell for a lower figure than has ever before been reached.

—The Change—

Will be beneficial if all pull together. The corporations are for corporations, first, last and all the time, and the report is current that they have bought improved clay land on the upper Hudson and will put in the latest improved machinery. As the grade of brick does not cut as much of a figure in the building of to-day as in times past, up-rivers, if well made and burned, and produced in the quantities that can be done with steam dryers, will have a tendency to make—if not next year, soon after—the American Brick Company the dictator of the trade.

—The Market—

Has taken the upward turn. The advance is enough per thousand to enable the manufacturer to indulge in turkey for Christmas, with strong hopes that there will be a further advance, and of such proportions that he can indulge in more costly presents than for several years. Why the market has not advanced a dollar per thousand, with all output stopped, would need a deal of explaining in some lines of trade. In the brick trade the manufacturer—well, he "don't know how it is that they do not bring more—but they ought to." That there is no reason why they do not the following figures speak for themselves: Nov. 16 showed fifteen barges left over; the following week, eighty-nine cars in, making 104 barges for the week. Of this number, ninety-three were sold, leaving only eleven on the market. With such a demand the following quotations look low: Haverstraw, $5.25 and $5.50; Newburg Bay, $5.25 and $5.50; up-rivers, $5.12½ and $5.37½; Hackensack, $5 and $5.25; pale, $1.50 and $1.75. The comparison shows that in a month just 37½ cents per thousand was the amount of the advance, when brick should be at the six-dollar mark. Will they reach it? The season is getting short and the advance is slow.

A. N. OLDTIMER.

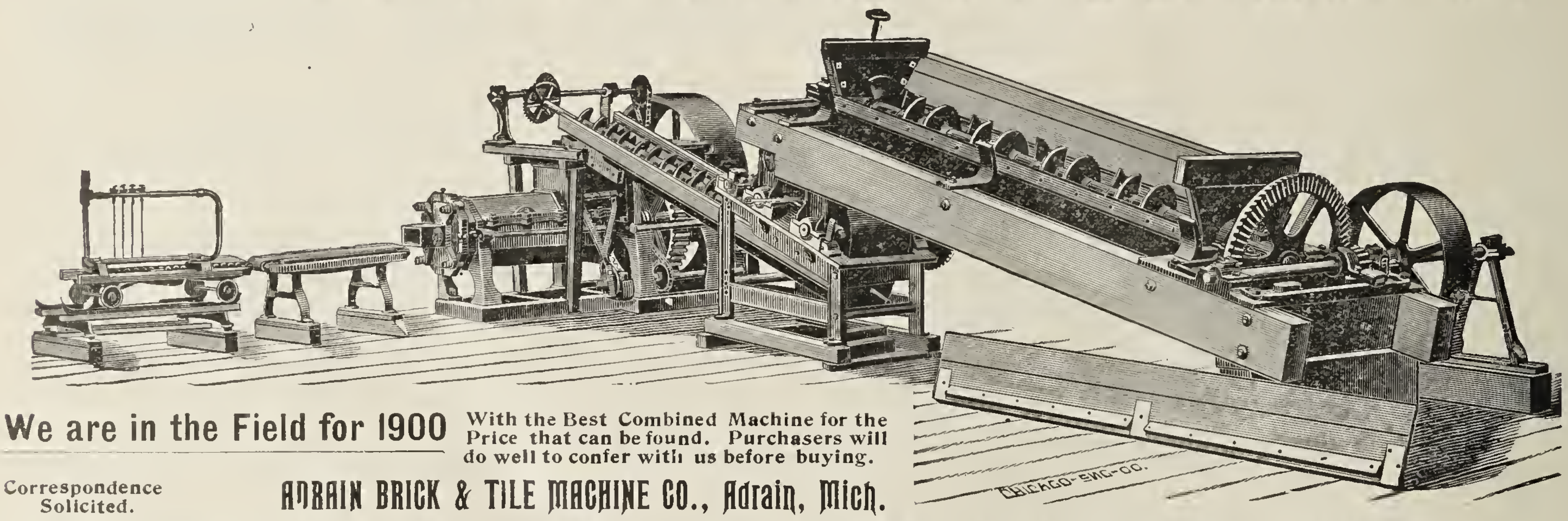
Hackensack, Dec. 9, 1899.

Let us then be up and "doing"
Every one we can, and thus
We may keep them from pursuing
Clever plans for "doing us."

—L. A. W. Bulletin.

VAN DUZEN'S STEAM JET PUMPS.

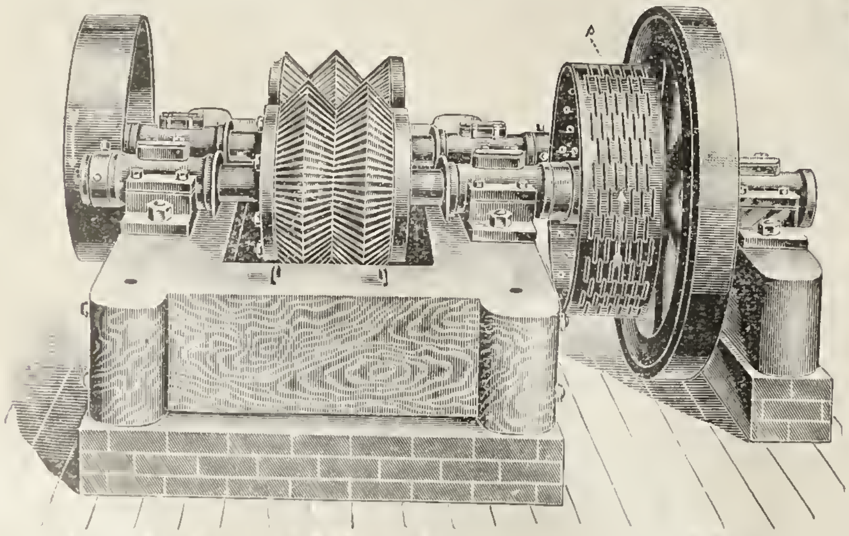
This little giant will force water to the height of fifty feet, more or less, depending on the steam pressure, and 1,200 to 1,500 feet horizontally. They can be worked in many places when no other steam pump can be placed. Write the E. W. Van Duzen Co., Cincinnati, O., for their catalogue No. 68.


CHICAGO-ENG-CO.

We are in the Field for 1900 With the Best Combined Machine for the Price that can be found. Purchasers will do well to confer with us before buying.

Correspondence Solicited.

ADRAIN BRICK & TILE MACHINE CO., Adrain, Mich.



NEWELL CRUSHER.

Successfully crushes any and all kinds of Clays, preparing same for Brick, Tile or Terra Cotta. Fully guaranteed. Fast shaft fitted with Para Pneumatic Pulleys, increasing power of the belt, and efficiency of the crusher.

Also we equip these machines with Improved Elastic Roller Bearings when when desired. These bearings greatly reduce friction thereby saving power in operating, and insuring an always cool journal.

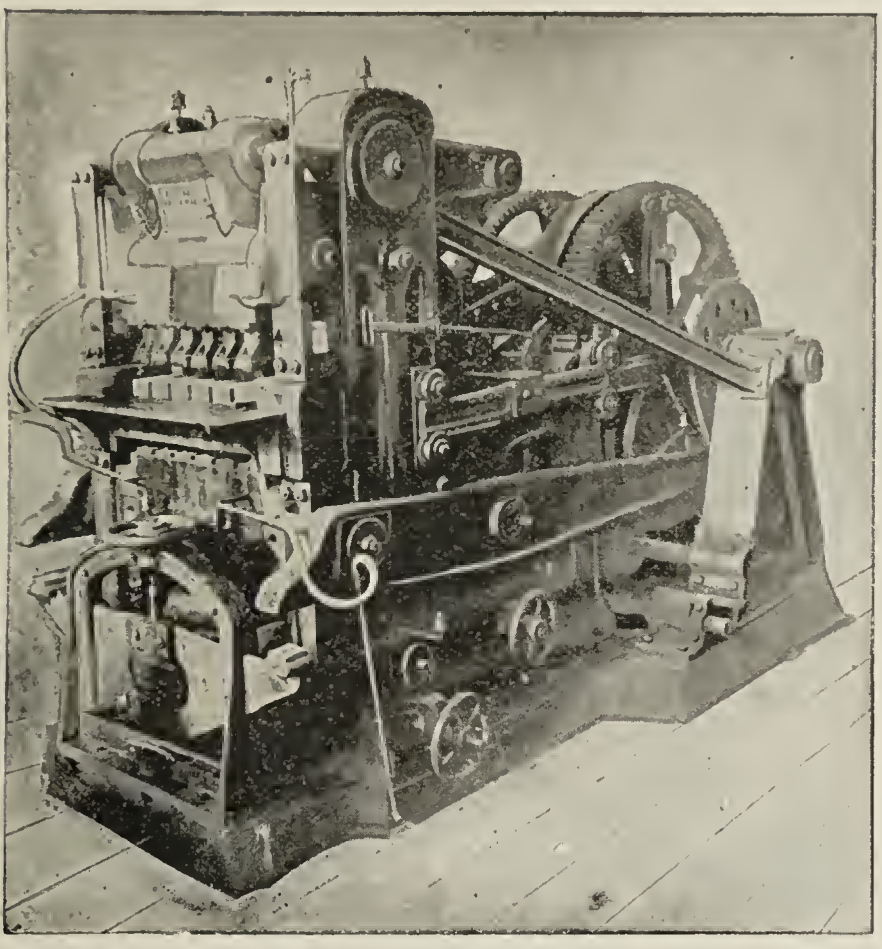
Our Crushers will do the work where others fail. Prices reduced Quality maintained.

Write us for price and particulars, stating capacity wanted.

DUPLEX HEATING & MACHINE CO. L'td.

Successsors to Newell Universal Mill Co.
534 West 22d. St., NEW YORK.

The Progress Brick Press.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

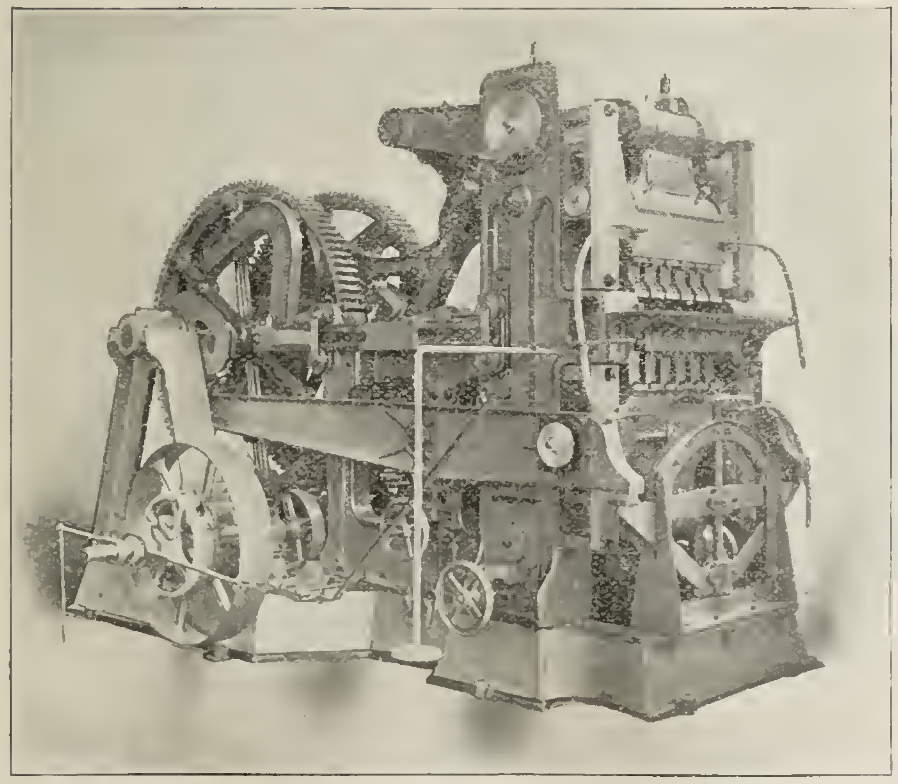
DESCRIPTIVE CATALOGUE ON APPLICATION. . . . .

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R. ***ST. LOUIS, MO.***

The Fernholtz Improved Brick Press.

THE BEST AND CHEAPEST.



Unequalled for {STRENGTH, DURABILITY and SIMPLICITY.

COSTS PRACTICALLY NOTHING FOR REPAIRS.

The lightest running Press in the market, requiring only 6 to 7 horse power to operate the largest 6-mold press. All parts subject to strain are made of the best bessemer steel, and can be seen and gotten at easily. The thickness of the brick can be changed and regulated without stopping the press, and every press is fitted with the Fernholtz mold Box, which is admitted to be the best in use. For fine pressed and ornamental brick, this machine cannot be equalled, the pressure on, and movement of the clay in the mold being such as to prevent granulation, and insures the most perfect product possible. We manufacture this press in 2, 4 and 6 mold sizes, also the **Fernholtz Patent Pulverizer,** and the **Fernholtz Clay Mixer** in our own factory and guarantee them fully.

The opinion of those using our press and full information on application.

Dealers in BRICKYARD SUPPLIES.

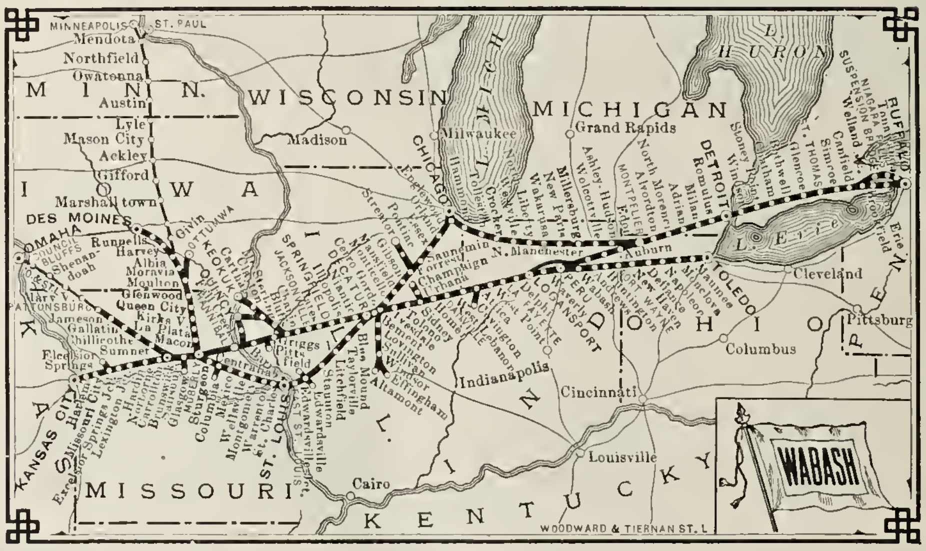
The Fernholtz Brick Machinery Co.,

WESTERN UNION CODE USED:
CABLE ADDRESS "FERNBRICK."

1214 to 1216 Poplar Street, ST. LOUIS, MO., U. S. A.

The...

Is the Official Route to the N. B. M. A.
meeting at Detroit in February 1900.



A GLANCE AT THE MAP WILL SHOW THAT THE **WABASH** IS THE DIRECT ROUTE TO DETROIT FROM KANSAS CITY, ST. LOUIS, CHICAGO, NEW YORK, BOSTON AND BUFFALO. FAST SCHEDULES AND ELEGANT THROUGH SERVICE. THE HIGH STANDARD OF BOTH CUISINE AND SERVICE MAINTAINED ON THE **WABASH** DINING CARS IS WELL KNOWN AND ACKNOWLEDGED.

* * *

J. RAMSEY, Jr.,
V. P. and Gen'l Manager.

H. V. P. TAYLOR,
Asst. Gen. Pass. and Ticket Agent.

C. S. CRANE,
Gen. Pass. and Ticket Agent.

ST. LOUIS, MO.

Clays Tested Practically

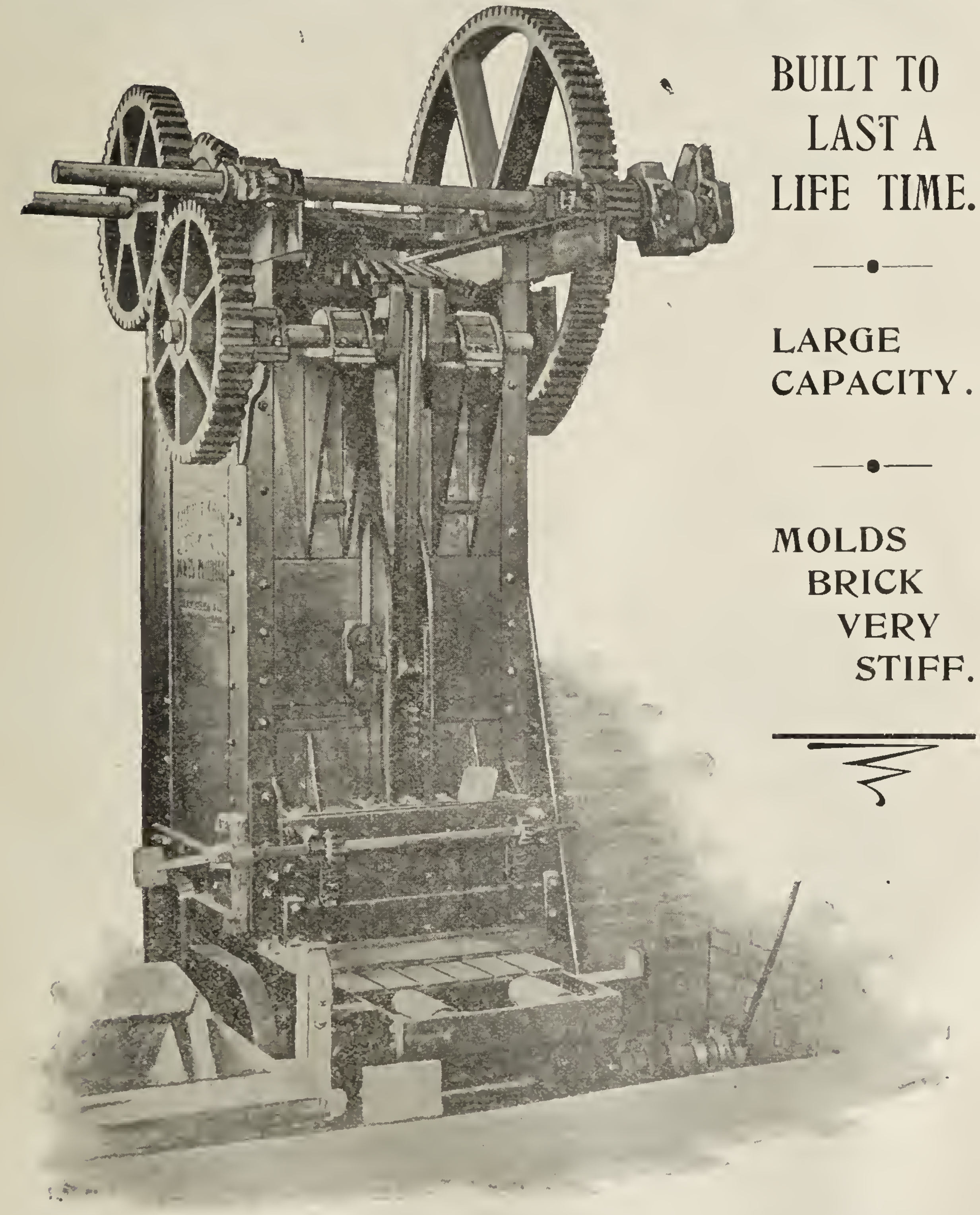
To Determine their Value and Best Adaptibility.

Also Chemical Analysis made of Clays, Minerals, Coal, Water, Etc.

Plans prepared for all kinds of Terra Cotta Works, Press Brick, Common Brick, Fire Brick Plants; Sewer Pipe and Fire Clay Works generally. The erection of works superintended if desired.
Stock companies incorporated, and their Stock and Bonds negotiated, and works put in successful operation.
Over 20 years experience. Satisfaction guaranteed.

FRANZ P. MEYENBERG,
Practical Manufacturing Engineer,
Office 161 La Salle Street, CHICAGO, ILL.

The Prangley Brick Machine.



BUILT TO LAST A LIFE TIME.

LARGE CAPACITY.

MOLDS BRICK VERY STIFF.

THIS Machine is constructed on practical lines by Mr. James Prangley, a successful brickmaker of thirty years experience. The tempering knives are of solid steel, and the press box is lined with steel, making it the most durable machine on the market. Brickmakers who buy the Prangley Machine will get their money's worth. Manufactured by

Write for Prices, etc., to
EDWARD C. HUHN,
Sole Selling Agent, 1215 Filbert St., Philadelphia.

JAMES PRANGLEY,
Lancaster, Pa.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than $1.00.

WANTED — Position as burner and brickmaker, by an experienced party. Can give good references. Address,
12 1 c "HIGH," Care Clay-Worker.

FOR SALE — Potts crusher, Quaker brick machine, Selden dry clay brick machine; all in fair condition; cheap.
ROSSLYNN BRICK CO.,
12 1 d 1321 F, N. W., Washington, D. C.

WANTED — Position as superintendent of paving or press brick plant, by a thorough, practical and experienced man. A No. 1 reference. "HUSTLER,"
12 4 d Care Clay-Worker.

WANTED — Second-hand engine of about 125-horse-power; must be in good condition and ready for immediate delivery. Address MISSOURI FIRE BRICK CO.,
12 1 d St. Louis, Mo.

WANTED — A first-class burner for a shale paving-brick yard. Must understand the business thoroughly and come well recommended. Address, P. B. CO.,
12 1 d Care Clay-Worker.

WANTED — A dry pan for grinding burnt clay. Must be cheap and in good order.
Address JOHN COOPER,
413 Oakland St.,
12 1 d Greenpoint, Brooklyn. N. Y.,

CAPITAL WANTED — To enable party to place before the brickmaking public patent kilns; patentee practical man. Address, J. H. G.,
Care General Delivery, Back Bay, P. O.,
12 1 d Boston, Mass.

WANTED — Permanent position as superintendent of brick works. Years of experience, thoroughly reliable and competent. Best of reference. Address,
"A GOODMAN,"
12 1 d Care Clay-Worker.

WANTED — Position as superintendent or manager, by a man of experience in dry-press, stiff and soft-mud, building and paving brick, fireproofing and sewer pipe. The best of reference. Address, C. L.,
12 1 C Care Clay-Worker.

FOR SALE — A large lot of good second-hand St. Louis fire brick and 12-inch floor fire brick, but little used and in first-class condition.
SIOUX PAVING BRICK CO.,
12 3 d Sioux City, Ia.

A GOOD MAN WANTED—To take charge of a building brick plant in the Northwest. Making brick by both the dry press and stiff clay process. Must understand all the details of the business; making, burning and management of men. A good permanent place for a reliable superintendent. References will be required. Write, stating salary desired, to
12 1 d NORTHWEST, care Clay-Worker.

TO LEASE OR SELL.

Extensive brickyard, on railroad, near Massena, N. Y. The works at Massena, of 150-horse-power capacity, have caused great growth of town, and consequently immense demand for brick. ATWATER,
12 1 d Care Clay-Worker.

CONSTRUCTION PLANS AND SPECIFICATIONS.

Furnished of modern and up-to-date dry-press, stiff-mud and soft-mud brickyards. Factories constructed by contract or by the day. Write at once to
I. M. JUSTICE,
12 tf d 250 W. 19th St., Erie, Pa.

FOR SALE—A GOOD PROPERTY.

Brick and tileyards, consisting of 12 acres land, 7-room dwelling house, engine and machinery, with necessary sheds and buildings. Superior clay, easily worked, good territory, near large city, rapidly growing suburbs. Time allowed on part if wanted. Reasons for sale given. Correspondence solicited. Address. "E.,"
12 3 cm Care Clay-Worker.

WANTED — -Within 60 days—8,000 pine pallets, 32 long or more, 10 wide.

H. H. WRIGHT,
12 1 50p Maitland, Mo.

WANTED — A party with about $8,000 to take a half interest in a soft-mud yard. Address

O. V. PAYE,
12 4 c Station "C," Los Angeles, Cal.

FOR SALE — A Ross-Keller triple pressure, six-mold, dry-press brick machine, capacity 35,000 brick per day; good as new; used only 90 days, and it is in first-class condition.

GEO. MATHERS,
12 3 dm 960 Nassau St., Cincinnati, O.

FOR SALE — At a bargain, to an early purchaser—A first-class brick plant, with soft and stiff-mud machinery and abundance of fine clay and shale. Sold this season 3,000,000 brick. Write for particulars to

W. R. EUBANK,
12 1 d Paris, Tex.

WANTED — Position as manager or superintendent of dry-press brick plant, by a thoroughly experienced and competent up-to-date brickmaker, capable of manufacturing and marketing the product; fully understands the requirements of the Eastern markets. Will consider only responsible parties. Can furnish A1 references. Address,

"H. K.,"
12 1 d Care Clay-Worker.

FOR SALE — Steam brick plant, in city of 12,000 population. Daily capacity, 20,000. Everything complete. Sale for 3,000,000 brick next year. Principal owner wants to retire to his old home in Indiana. Only principals with money need apply. If sold in next 60 days it will go cheap; after that may not be offered for sale, as may decide to stay. An experienced brickmaker can clear big money in this plant. Address

"MON.,"
12 1 dm Care Clay-Worker.

FOR SALE — A comparatively new brickyard, in a large city in Ohio. Good demand for common brick, with every prospect for a still greater demand for the coming year. The plant is equipped with both soft-clay and stiff-clay machinery, all in good running order, and virtually new. Health of owner makes it necessary for him to go South. The yard is on leased land, but will pay for itself many times over within the leased period. A splendid opportunity for a practical brickmaker with limited capital. $5,000 will buy the entire plant and lease. Worth twice that. Part time will be given perfectly responsible party. The chance of a lifetime for a superintendent who has saved up some money with which to start in business for himself. Works can be started without any expense for repairs. For further particulars address,

O. L.,
12 tf S Care Clay-Worker.

FOR SALE.

Two 100-h.-p. Corliss engines.
Two 100-h.-p. boilers.
Two Penfield auger brick machines, with automatic end-cut, 50 M. capacity each.
Two 10-foot pug mills.
One 8-foot dry pan.
225 iron brick cars.
20,000 wooden pallets. Will sell cheap.

J. A. BUCKSTAFF,
12 1 dm Lincoln, Neb.

FOR SALE CHEAP.

Complete brickyard, in the centennial city of Ohio, with 12 acres land; good clay bank, 9 and 12 feet deep. Complete outfit, consisting of 2 good brick machines, one Penfield and other a Monarch; 2 engines, 100-horse-power boiler; a dryer, with large Buffalo fan, the attachments for same, and all necessary equipments for a first-class brickyard. Paved street and 2 railroads to the yard. Price for brick, $6 to $7 per M. Reasons for selling, poor health. Address,

JOSEPH GATES,
12 3 cm Toledo, O.

FOR SALE.

One Martin horse-power brick machine. One Standard wood-frame horse-power brick machine. One Standard wood-frame steam-power brick machine. Two extra heavy Quaker machines. One Fletcher & Thomas pug mill. One Monarch brick machine. One Anderson brick machine, with 12-foot pug mill. Four Reliable hand brick machines. One Wellington mold sander. One Potts mold sander. One Freese No. 4 board delivery cutter. One Brewer cruhser. One new Brewer crusher. One Carnell repress. One Penfield pug mill. Two Penfield roll crushers. One Penfield No. 7 brick and tile machine.

HORTON MANUFACTURING CO.,
12 tf d Painesville, O.

....WHAT THE CLAY WORKER NEEDS....

Is a belt that will accomplish the heavy work required of it,

holding the bucket firmly without slipping.--This the

Leviathan Belting

does better than any other, and, what is of more interest to Clay Workers, the LEVIATHAN will

WORK FOR YEARS IN A DUST CLOUD,

or exposed to weather conditions of any kind.

THESE ARE THE REASONS WHY LEVIATHAN BELTING IS IN SUCH GENERAL USE AMONG CLAY WORKERS.

MAIN BELTING COMPANY,
1221-41 Carpenter St., Philadelphia, Pa.

1221-41 Market St., CHICAGO. Send for Price List and Samples. **120 Pearl St., BOSTON.**

Evens & Howard Fire Brick and Sewer Pipe Company,

ST. LOUIS, MO.

Forty Years in Existence.

If you would buy cheap, inquire prices **before purchasing.**

Conveying, Elevating and Power Transmitting Machinery.

A COMPLETE LINE OF THE BEST.

CALDWELL HELICOID CONVEYOR.

The ONLY PERFECT SPIRAL CONVEYOR with CONTINUOUS FLIGHT, NO LAPS, NO RIVETS.

Seamless Steel Elevator Buckets, Elevator Boots, Rope Transmission Machinery, Sprocket Wheels, Link Belting, Shafting, Belting, Hangers, Pulleys, Gears, Car Pullers, Automatic Power Grain Shovels, Wood Split Pulleys, Wire Cloth, Perforated Metal. Complete equipments for handling materials of all kinds.

H. W. CALDWELL & SON CO., 127-133 West Wash. St., CHICAGO, ILL.

Our new Catalogue No. 25 (380 pages), will be sent upon application.

The Best Brick Drier

Is the Drier which dries the Brick safely, quickly and thoroughly in the shortest time and with the least cost and labor. This the **Phillip's Fan Dryer** will do. The first cost of construction is moderate and cost of operation is much less than old style dryers. Soft Mud, Stiff Clay or Dry Press Brick dried speedily and economically. The **PHILIP'S DRYER** is no experiment but is now in successful operation in a number of plants in the U. S. and Canada. If you are interested in the drying problem don't fail to write for circulars.

S. G. PHILLIPS, Agent and Patentee, **161 Grand Street, Rahway, N. J.**

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

WORKERS OF CLAY:—

I am after your trade in the kiln line. I am after it with a kiln that will burn your ware, honestly, economically, uniformly and quickly, anything from a vitrified paver to the finest pottery. No matter whether you want the smallest kiln or one that will hold 100,000, one kiln or many, I want your trade. More than 1,000 in use in three countries.

Reward For Information of Infringements.

Ask for what they say of it, and address the Patentee.

E. M. PIKE,

CAPT. G. H. ETTLA, Agt.
Marietta, Pa.

Chenoa, Ill.

IF YOU NEED..

Wooden Pallets

WE CAN FURNISH YOU THE BEST

We make all Styes of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,
Also *Decks for Dry Cars.*

We can ship them anywhere.

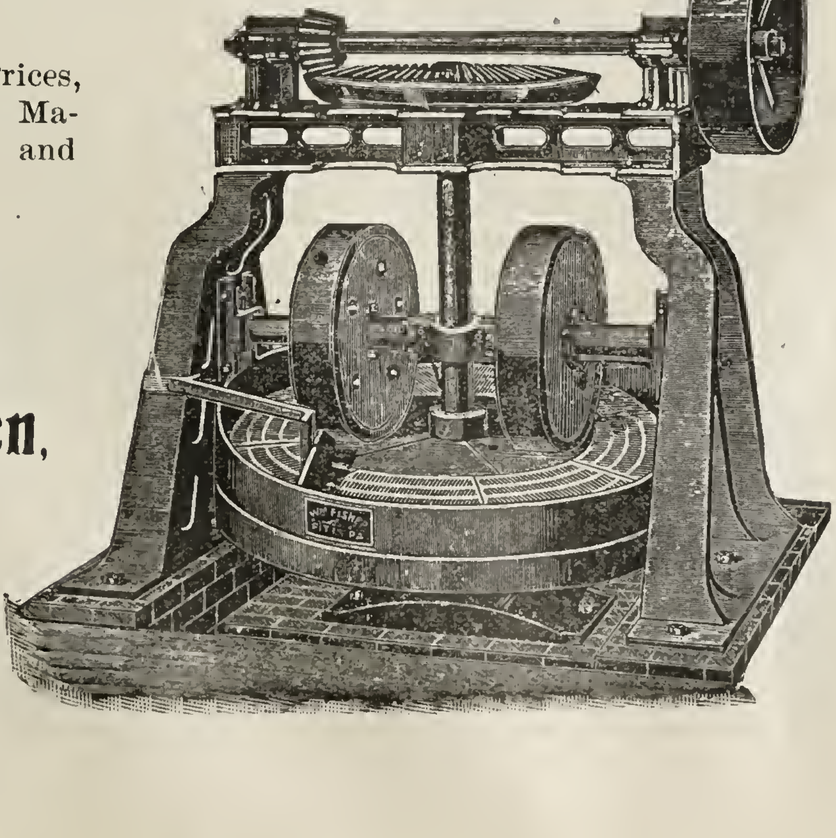
Get good Pallets from those who know how to make them, It will pay you in the long run. . . . . . . Send for circulars and prices.

W. B. MERSHON & CO.,
Saginaw. East Side Mich.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.



Phillips and McLaren,
Proprietors,
Fisher Engine, Foundry and Machine Works,
24th and Smallman Sts.,
PITTSBURG, PA.

FOR SALE — One "Freese" differential smooth roll clay crusher; good condition.
ENGLISH MINING & MFG. CO.,
10 tf d Jackson, Mo.

WANTED—Position as Superintendent of fire brick works by a practical and experienced man in management of works manufacturing fire clay and silica brick. Address F. B.
10 tf d care Clay-Worker.

FOR SALE — Brick and tile works, in good condition; large capacity; plenty of market; would consider other property for part pay; now in operation. Address
D. W. TOWNSEND,
9 6 d Cherokee, Ia.

FOR SALE — Yard rights of the Swift stack, coal coking table, furnace, kiln, together with guarantee and protection; send for price list and catalogue.
F. E. SWIFT,
9 tf d Washington, Ia., U. S. A.

FOR SALE — One automatic end cut brick machine, Penfield make; one pug mill, roller crushers and other equipments, with engine; capacity 20,000 per day. Address
S. W. BURNHAM,
11 2 d Lincoln, Neb.

FOR SALE — One four-mold Eureka dry pressed brick machine, but little used, at a great bargain; one No. 2 Worrell dryer; one 48-inch Ross disintegrator.
C. SIEDLER,
11 tf d 156 Fifth Ave., New York, N. Y.

WANTED — A first-class superintendent and burner; one experienced in dry pressed brick manufactured from shale; permanent position to right party. Address, with references, stating salary expected,
D. J. YOUNG,
11 cm Fort Smith, Ark.

WANTED — Position, by practical man, as manager or superintendent, experienced in the manufacture of fire and common clay products—brick, tile, blocks, stove linings, pipe, front, common, and other goods. Handling of men; up and down-draft, continuous and other kilns. Will take entire charge. Address, W. D.,
12 1 cm Care Clay-Worker.

WANTED — A first-class man as foreman of brick and tile plant. One who thoroughly understands the setting up, keeping in repair and running all kinds of brick and tile machinery, and handling a gang of men successfully. Good salary and permanent position to the right man. Address
TILEMAKER,
11 2 d Care Clay-Worker.

WANTED — For a large clayworking establishment, located near New York city, an experienced superintendent or manager, who thoroughly understands the manufacture of fireproofing as well as common brick; applicants please state past experience, amount of salary expected, references, etc. Address
H. F. JAMES,
11 tf d 156 Fifth Ave, New York.

FOR SALE — One of the best brickyards in central Nebraska; fully equipped with E. M. Freese machinery; located in a live town; two railroads; brick selling for from $6 to $9 per thousand; permanent kilns; capacity 20,000 per day, with unlimited demand for brick; want to sell on account of poor health. For particulars address
BRODER KETELSEN,
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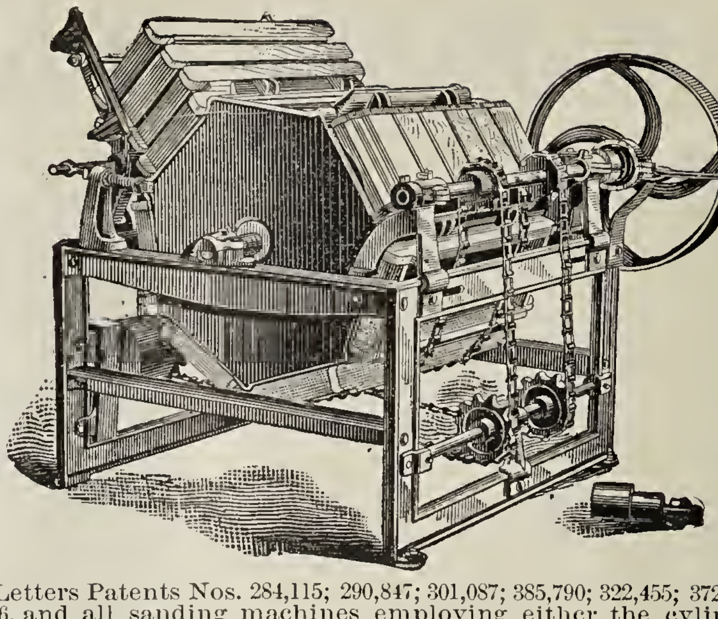

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The United States Courts have in several cases sustained the validity of these patents and issued injunctions against infringers. Buck is now out of the market; several suits have been commenced against users of the Martin sander, all of which have been succesful. A suit is now pending against the Brockway Brothers Co., of Fishkill, for the use of the Horton Sander.

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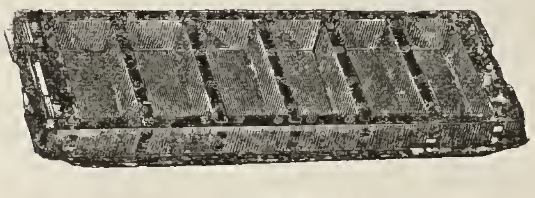
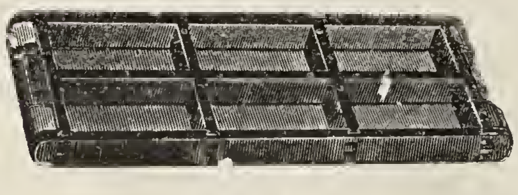


6 Brick Machine Mold.



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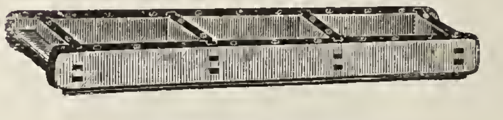

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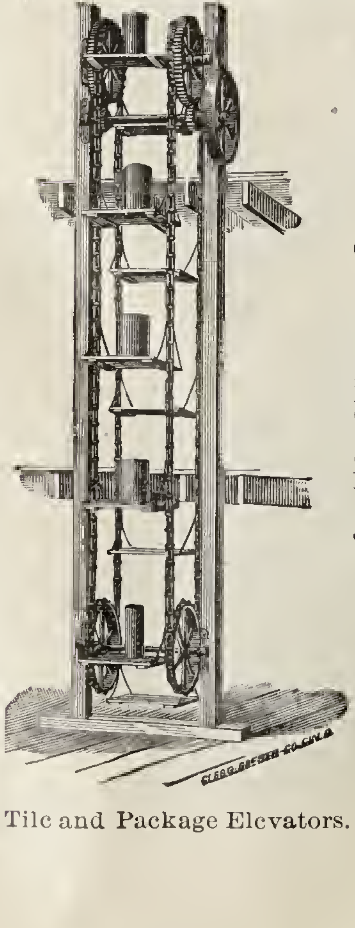

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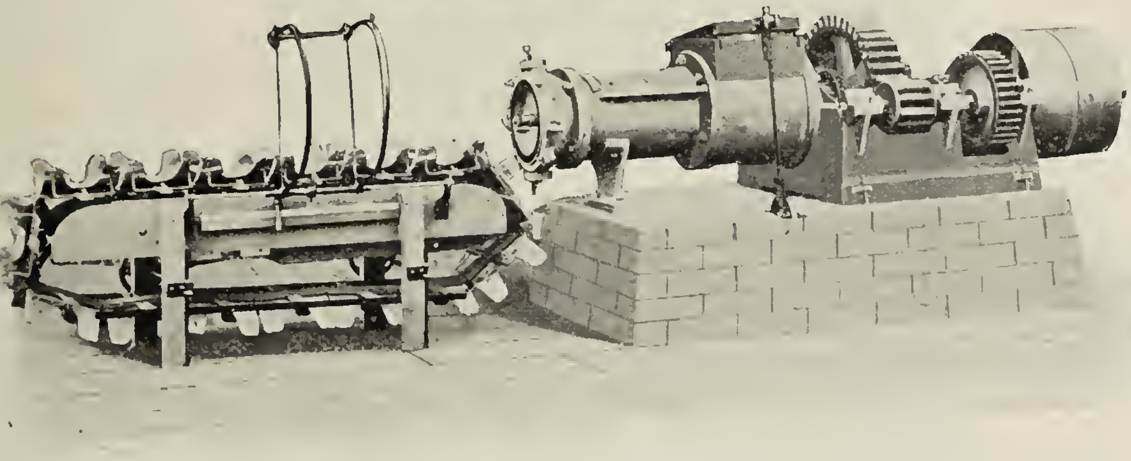

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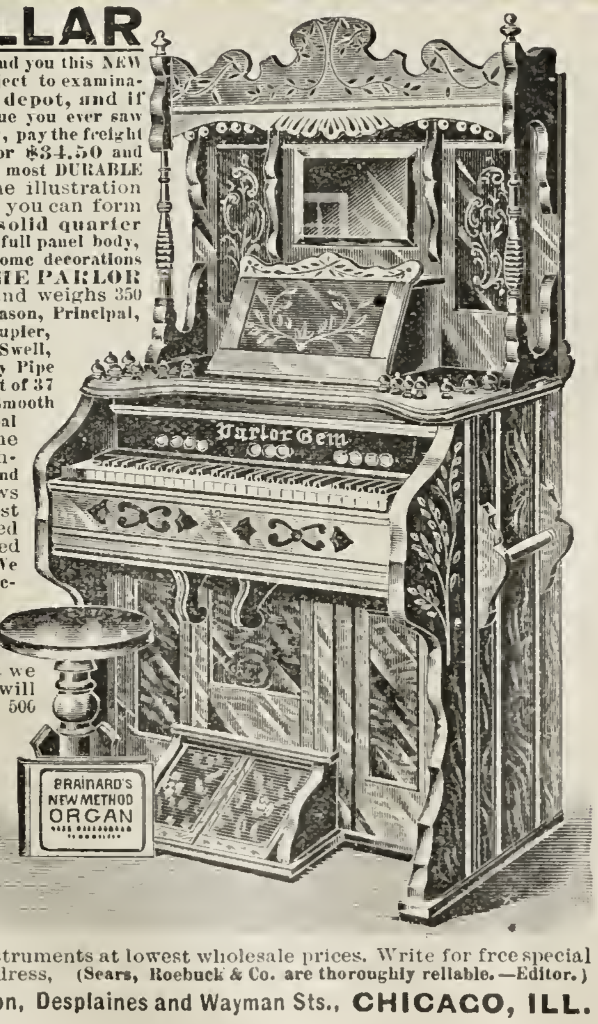

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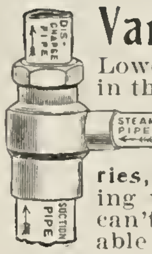

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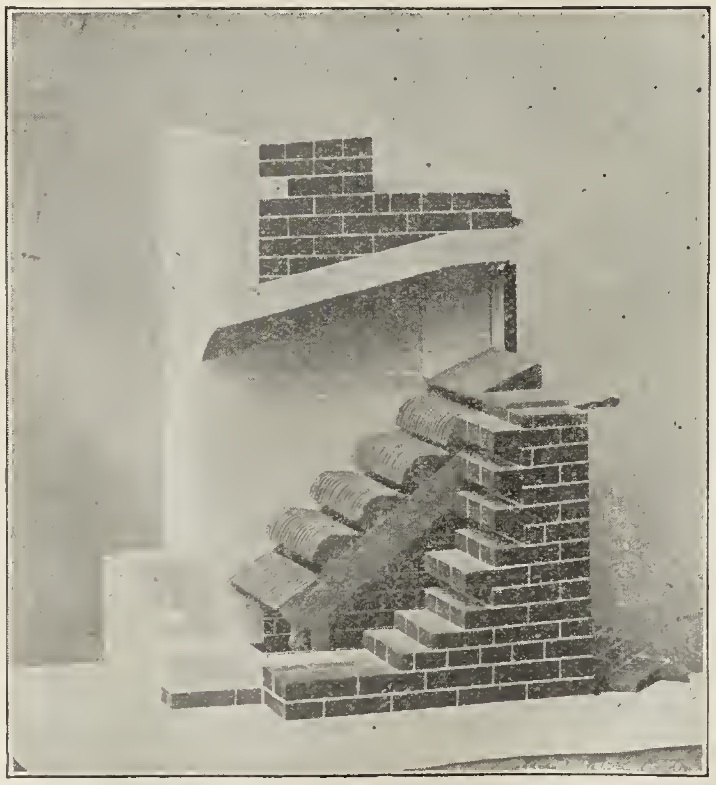

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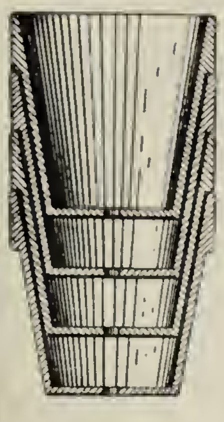

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The HARPER-NORTON SHALE BRICK CO.,

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MANUFACTURERS OF

Paving, Face and Common Shale Brick, Pressed and Unpressed.

Present capacity ten million. We are now prepared to furnish fine vitrified paving and extra hard foundation brick in any quantity. Correspondence solicited.

New York Brick & Paving Co.,

Manufacturers of

VITRIFIED PAVING BRICK,

Sewer and Hard Building Brick,

. . . ALSO . . . .

Berlin Vitrified Brick that Withstands all Acids.

OFFICE:
204 S., A. & K. BUILDING. SYRACUSE, N. Y.

Vitrified Paving Brick.

A valuable treatise on the manufacture and use of paving brick up-to-date. By H. A. Wheeler, E. M.

Mailed to any address on receipt of $1.00.

T. A. RANDALL & CO.,
Publishers,
INDIANAPOLIS, IND., U. S. A.

W. C. SIBLEY, PRES. J. W. SIBLEY, TREAS.

The Coaldale Brick and Tile Co.,

MANUFACTURERS OF

Standard Paving Brick,

Also Fine Pressed and Ornamental Brick.

Coaldale Vitrified Pavers,

Represent the Highest Standard of Excellence.

Not only have they repeatedly withstood the most exacting tests required by expert engineers, but they have proven by that more practical test—actual use, to have unsurpassed wearing qualities.

The extent and character of our clays and facilities for manufacture insure uniform quality of product.

Samples, prices, etc., furnished on application.

FACTORY AND SHIPPING DEPOT,
COALDALE, ALA.
TELEGRAPH OFFICE,
WARRIOR, ALA.

BRANCH OFFICES
BIRMINGHAM, ALA.,
MONTGOMERY, ALA.,
NEW ORLEANS, LA.

The Purington Paving Brick Co.,

of GALESBURG, ILLINOIS,

HAS the largest and best equipped plant in the United States for the manufacture of Paving and Sidewalk Brick. The Galesburg Paving Brick have a reputation second to none and this Company points with pride to its record for quality of material and its methods of conducting its business.

Correspondence respectfully solicited.

The Terre Haute Brick and Pipe Co.,

Manufacturers of Best Quality of

VITRIFIED PAVING BRICK.

You should use them in sewers and building foundations as well as streets. If you do not think so—write us, we will say why.

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OFFICE: 306 Opera House,
TERRE HAUTE, IND.

The Clinton Paving and Building Brick Company,

Manufacturers of the Highest Quality of

Paving Brick

Which are offered to the municipalities of the Central States under positive guarantee as to wearing quality. None better.

Prices and samples sent on application.

Correspondence solicited.

Office and Works: Clinton, Ind.

J. L. HIGLEY & CO.,

CANTON, OHIO.

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Four of the largest and best paving brick plants in the world.

Canton
Paving
Block,

Head the list for uniformity, finish and wearing qualities.

Samples sent free on application.

Write for prices.

T. B. McAVOY,
PRESIDENT.

FRANK B. McAVOY,
SEC. AND TREAS.

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McAvoy Vitrified Brick Co.,

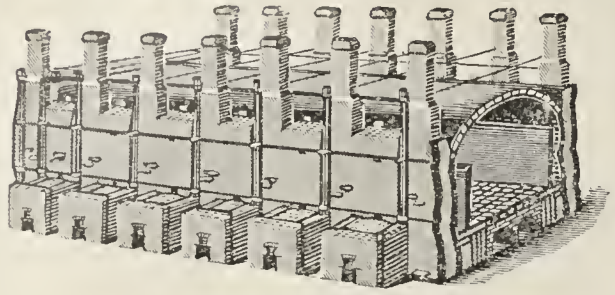
of PHILADELPHIA,
PENNSYLVANIA.

Is the largest and best equipped plant in the East for the manufacture of Paving Brick. All brick sold under a guarantee.

Correspondence solicited.

OFFICE:—1345 ARCH ST., PHILADELPHIA.
WORKS:—PERKIOMEN JUNCTION, PENN.

The Bushong Down Draft Kiln



PATENTED JUNE 1896.

Is so constructed that the **heat** is **equally distributed** to **all parts** of the **Kiln.**

For **uniform** and **all hard burning** this kiln leads them all. Built any size desired. This kiln is now being used by some of the largest brick plants in the country.

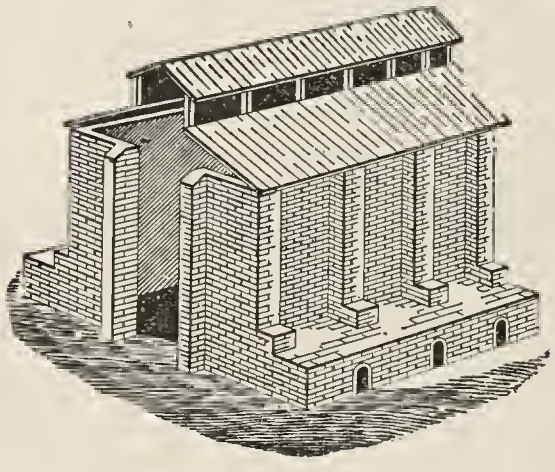
For further particulars, address

M. M. BUSHONG, - Phoenixville, Pa.

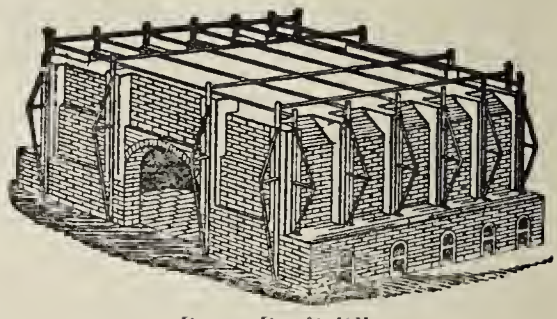
LOUIS H. REPPELL'S

IMPROVED-KILNS

For Burning all Kinds of Wares.



Up-Draft Kiln.



Down-Draft Kiln.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.

The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPPELL, **2,422 Chestnut St.,** ***Kansas City, Mo.***

MORRISON'S LATEST IMPROVED KILN.

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brickmaker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,

P. O. Box 335. ***ROME, GA., U. S. A.***

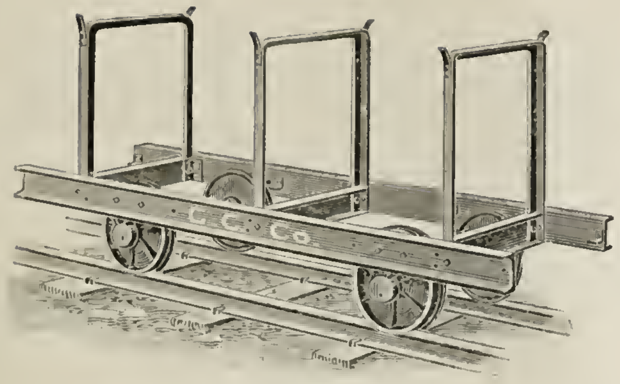
HAIGH'S NEW SYSTEM OF CONTINUOUS KILN.

This Kiln is now burning

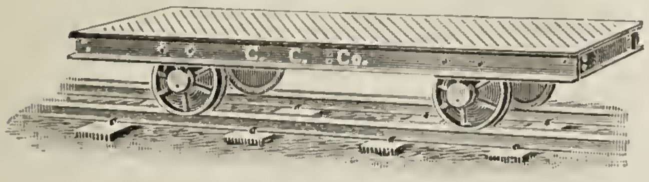
DRY PRESSED FACING BRICK, ROOFING TILE, PAVING BRICK and COMMON BUILDING BRICK.

Points of Superiority:--Cheapness in Construction. Easy to understand and operate. Perfectly free from any nuisance. Will save fully one-half of the fuel used on other kilns. All waste heat is utilized in the Dryer for drying purposes which brings this down to the very lowest cost possible to be obtained.

For further particulars, address **H. HAIGH, Catskill, N. Y.**



No. 231 DOUBLE DECK.

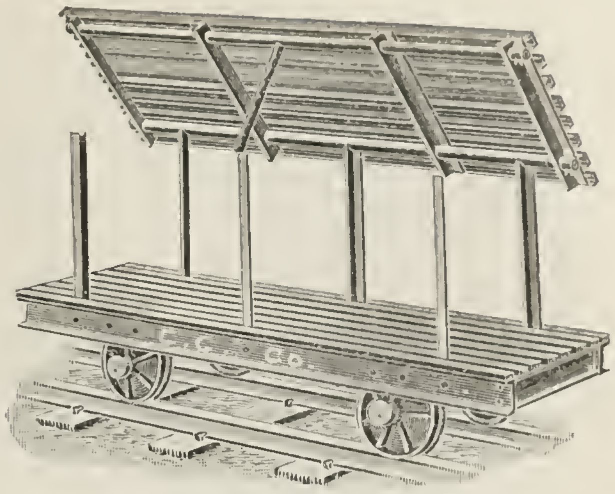


No. 214 SINGLE DECK.

CHANNEL STEEL BRICK CARS.

Quality Unexcelled.
Prices Reasonable.

Cleveland Car Co.,



No. 232 DOUBLE DECK, with Steel Decks.

150 Scranton Ave., CLEVELAND, OHIO.

Please Mention The Clay-Worker.

Have You Ever Considered This?

That a Very Small Quantity of

Dixon's Ticonderoga FLAKE GRAPHITE.

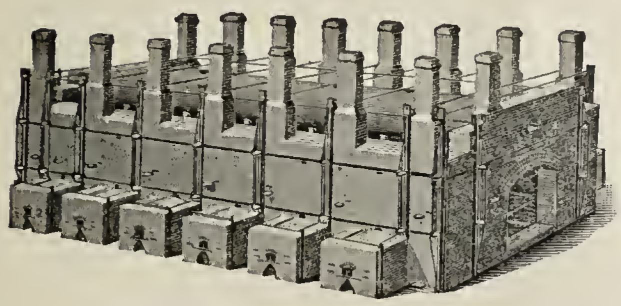
Say 5 to 10 per cent. added to the grease or oil that you are now using, will make you oil or grease do three to six times as much work and do it much better.

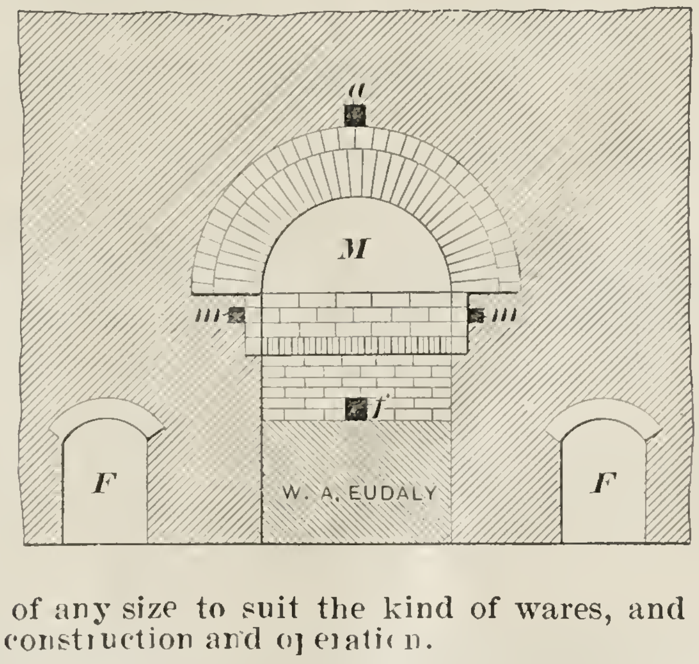
This has been fully demonstrated but if you want to prove it for yourself we will send you samples free of charge and a pamphlet giving full particulars.

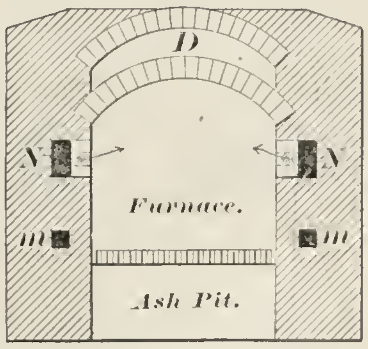
JOSEPH DIXON CRUCIBLE CO., Jersey City, N. J.

The EUDALY DOWN DRAFT KILNS.

STEAM and AIR BLOWER and HOT AIR DRYING SYSTEM.







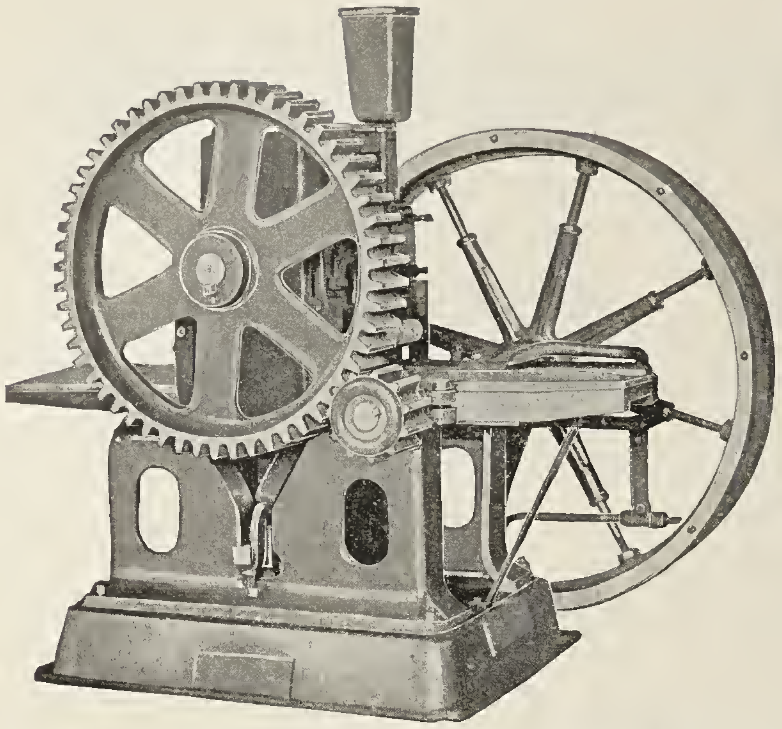
These kilns are built round or square and of any size to suit the kind of wares, and daily capacity of the plant. Burns uniform and all hard. Economical in construction and operation.

The Eudaly Combination Furnace burns any kind of fuel. This is the best furnace known for burning wood, coal, slack coal or wood and coal combined.

The Eudaly Adjustable Steam and Air Blower is something new and is especially adapted to the burning of culm or coal dust economically.

The Eudaly System of utilizing the waste heat from cooling kilns is one of the greatest fuel savers known.

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.



The Steele Repress,

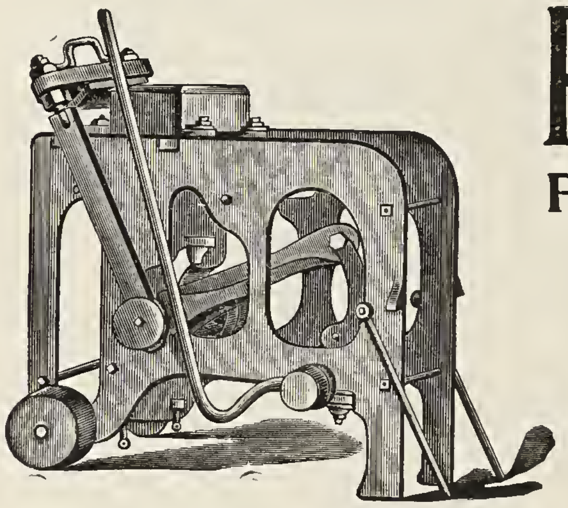
Price $185.00.

This is a very compact, strong and easily operated Press designed for the large number of yards which have more or less local demand for repressed brick which they are now filling with Hand Presses.

The compactness of this machine makes it almost impossible to break it, at the same time reducing the cost to very little more than hand press. A number of them have been in operation the past season giving perfect satisfaction.

> Fletchers, N. C., Oct. 27, 1899.
> Messrs. J. C. Steele & Sons, Statesville, N. C.
> Relative to the Repress we are making 12 M brick per day and it works first rate with a standard paving die.
> Yours truly,
> Asheville Brick & Tile Co.

J. C. STEELE & SONS, Manufacturers of The "NEW SOUTH" BRICK MACHINERY, **Statesville, N. C.**



RED BRICK PRESS.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

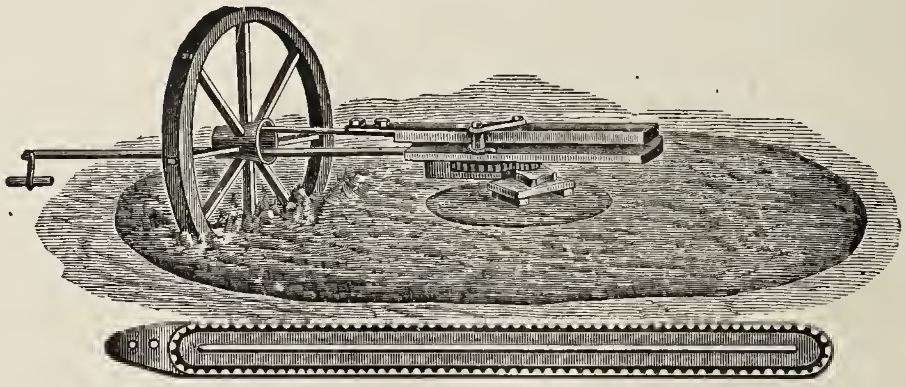
....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

☞ Send for Circular and Price-List.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

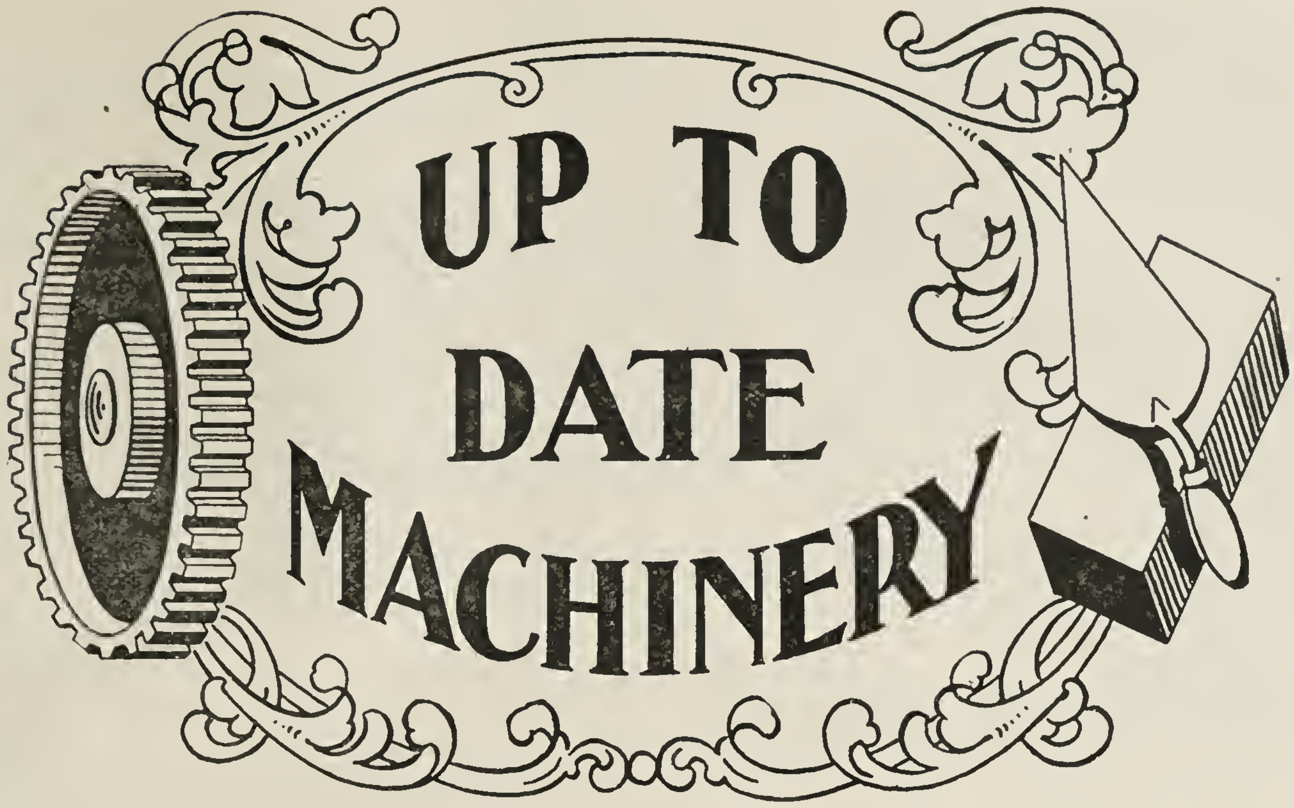
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

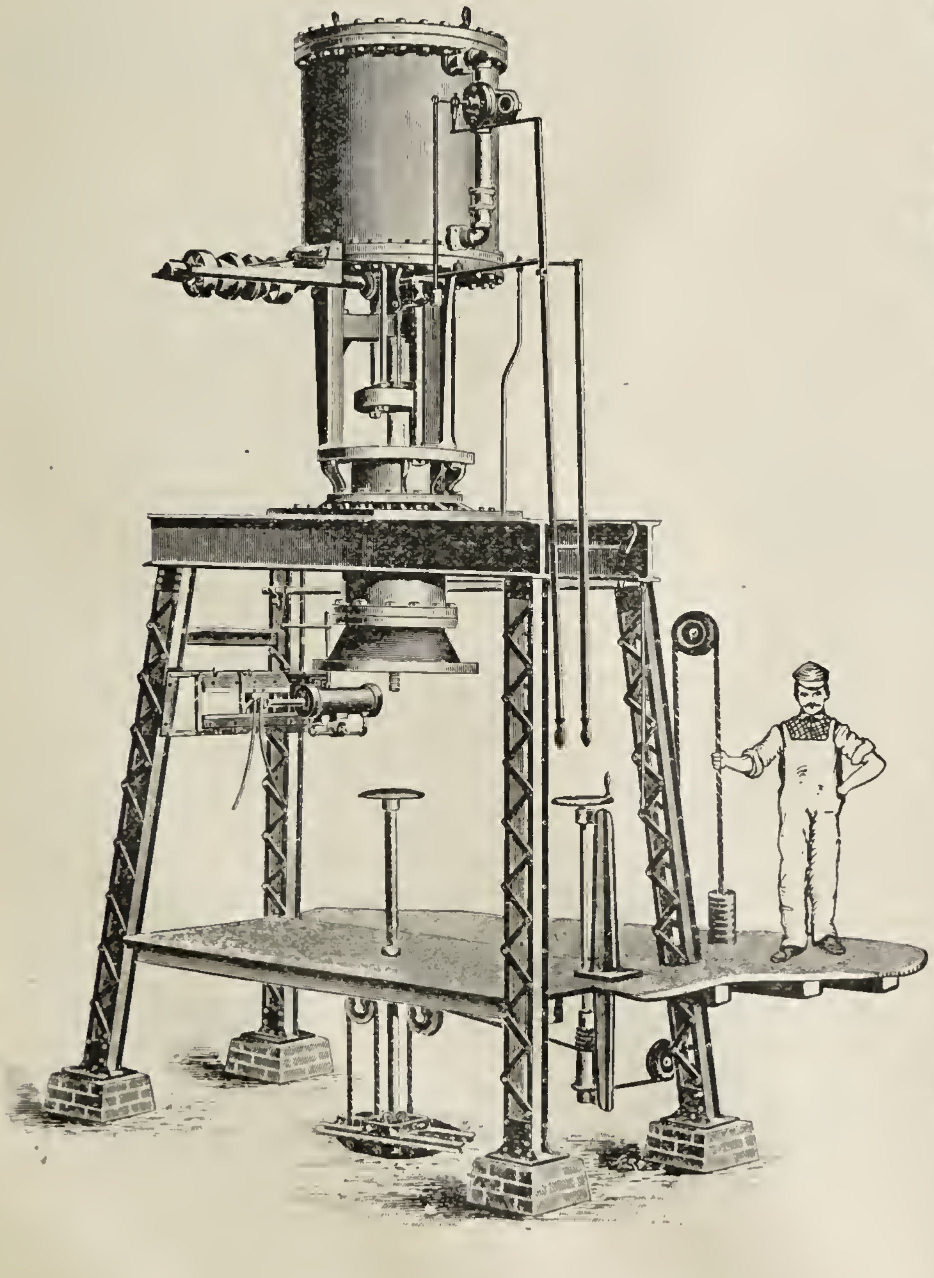
[Mention the Clay-Worker.] CORRESPONDENCE SOLICITED.



When Buying New Machinery

Why not get it strictly **UP-TO-DATE?** Machines go out of date soon enough anyway, without buying a back number to start with. All the latest conveniences and improved appliances for making Sand Moulded Brick, Wire Cut Brick, Paving Brick, Drain Tile, Fire Brick and Pressed Front and Ornamental Brick, can only be found on our machines. Chicago is a strictly Up-to-Date town, and we are right in the middle of it.

CHICAGO BRICK MACHINERY CO., 225 Dearborn Street.



Modern Clay Working Machinery.

We Furnish Complete Equipments for Sewer Pipe, Drain Tile and Fire Proofing Factories.
OUR DIES for Sewer Pipe, Drain Tile and Fire Proofing are Unequalled.

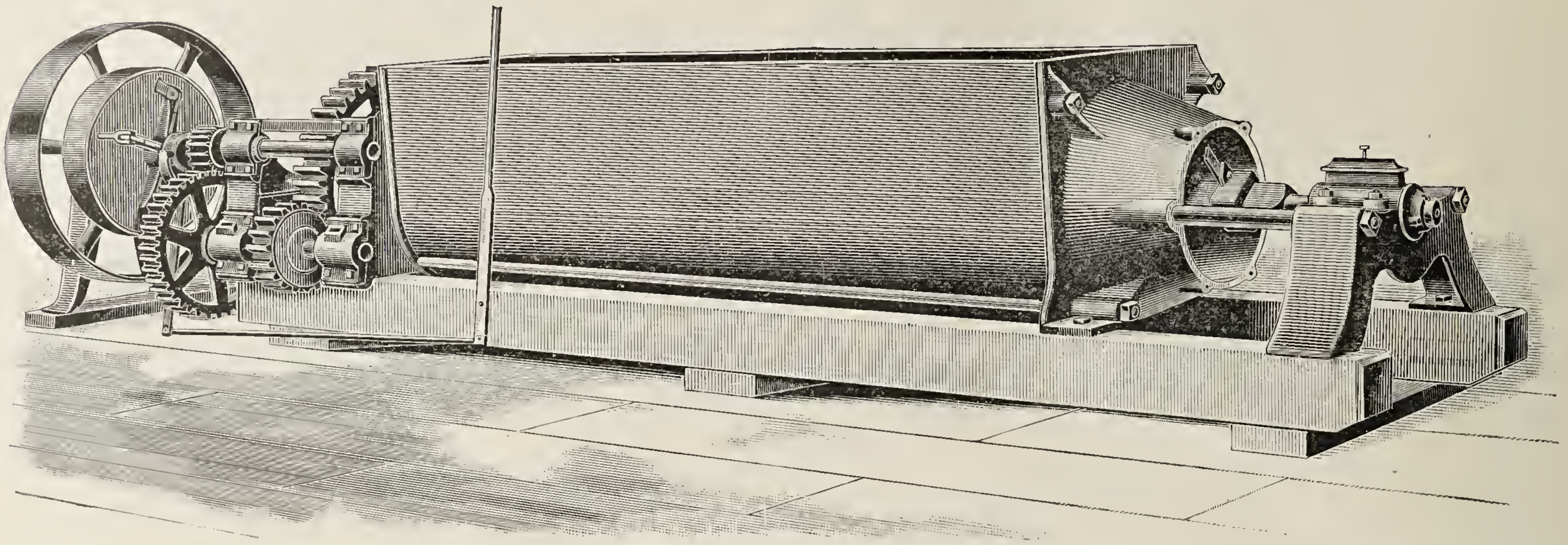
Steel Frame Dry and Wet Pans.

CATALOG ON APPLICATION.

TAPLIN, RICE & COMPANY,

Akron, Ohio.

A GOOD THING.

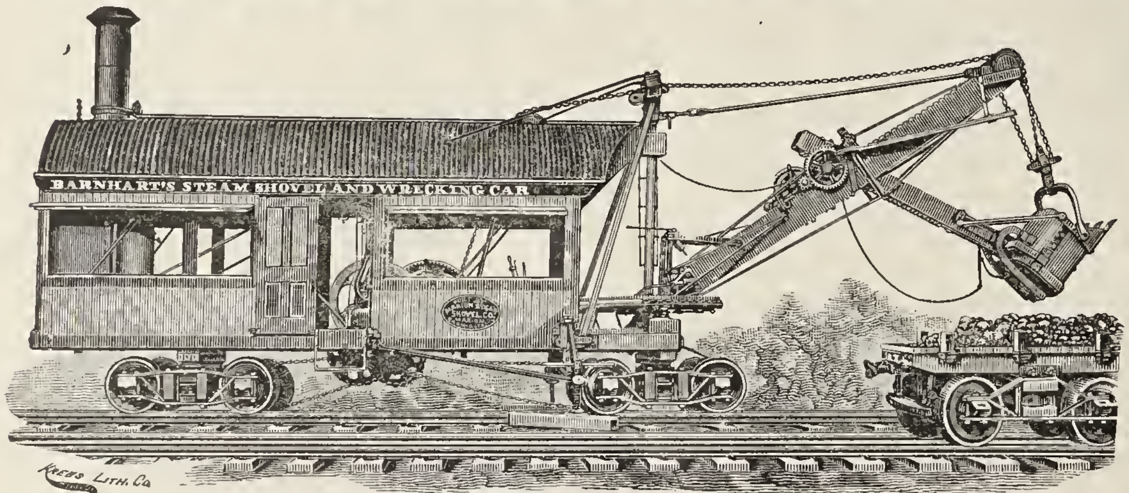


Leader Pug Mill, Size No. 9.

Send for circulars of our **Leader Machinery.**
Brick Machines, Pug Mills, Crushers, Disintegrators, Automatic Cutters, Etc., Etc.

LEADER MANUFACTURING CO., Decatur, Ill.

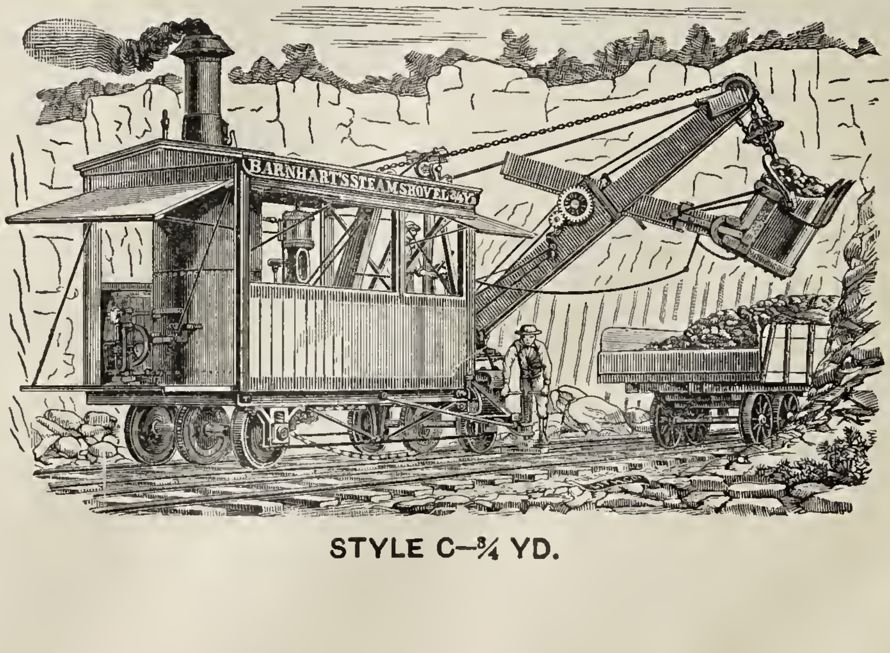
Steam Shovels for Brickyards.


BARNHART'S STEAM SHOVEL AND WRECKING CAR
Krebs Lith. Co.

STYLE A—1½ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

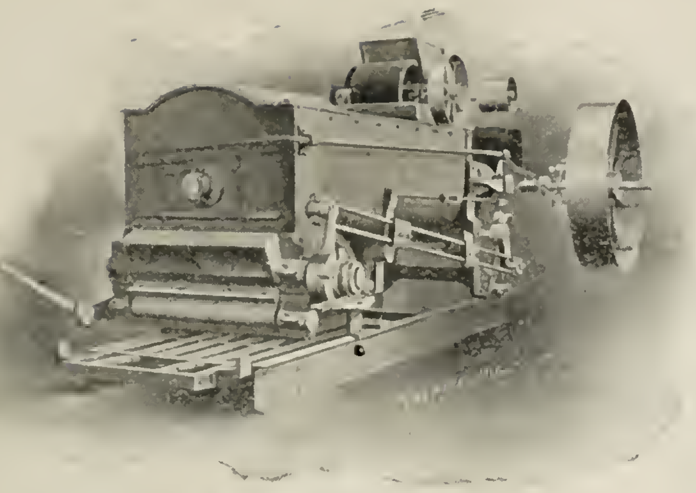
We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.



STYLE C—¾ YD.

Write for testimonials and illustrated catalogue to

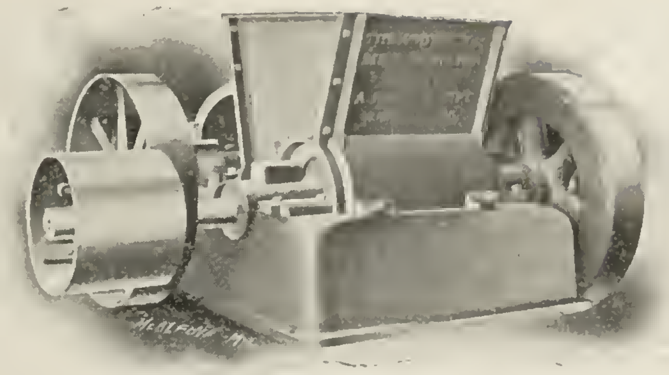
The Marion Steam Shovel Co.,
603 West Center Street, - **MARION, OHIO.**



Horizontal Anderson Brick Machine.

DON'T PURCHASE UNTIL YOU WRITE US.

We can save your money.



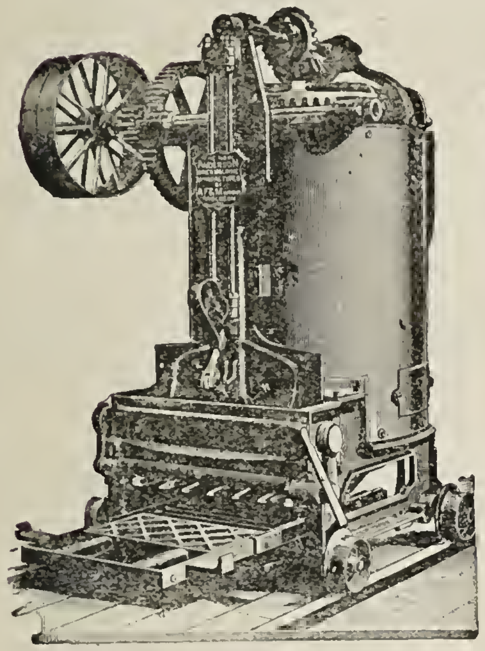
Best Disintegrator on the Market.

MANUFACTURERS OF....

New Departure Tile Machine,

The only machine for making Tile from 3 to 24-inch Diameter.

Pug Mills, Moulds, Trucks and Barrows,
And all Brickyard Supplies.



Steel and Iron Upright Stock Brick Machine.

1899 Horse Power Machine.

The Anderson Foundry and Machine Works,
Anderson, Ind.

THE HENRY MARTIN BRICK MACHINE MFG. CO., INCORPORATED.

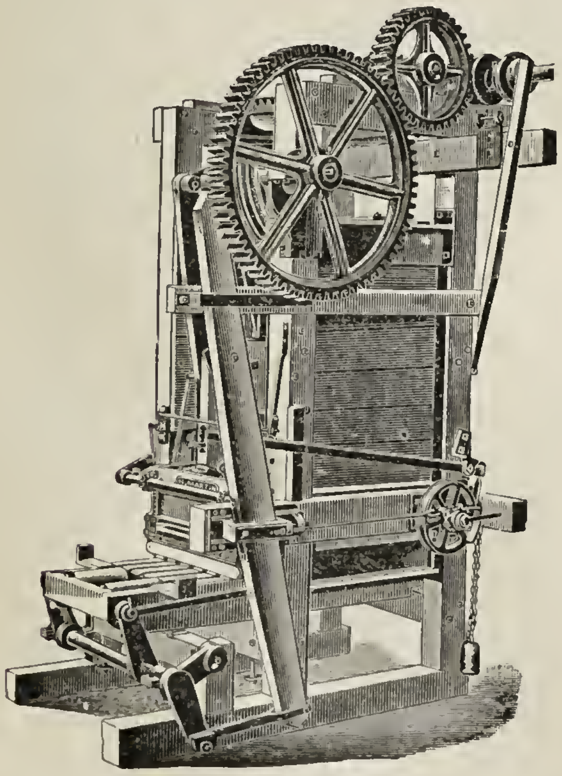
LANCASTER, PENN., U. S. A.

Sole Manufacturers and Exporters of

The Famous "MARTIN" BRICK MACHINERY

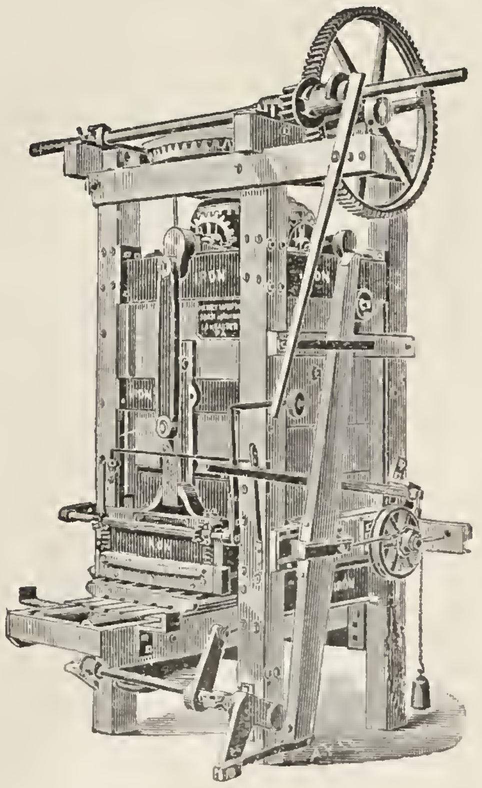
....AND....

BRICKYARD SUPPLIES.



CAPACITY 50,000 PER DAY.

IF YOU Intend adding any new machinery, or changing your plant in any way, it will be $ $ $ $ saved to write us before placing your order.



CAPACITY 35,000 PER DAY

Correspondence Cheerfully Answered.

N. B.--Our Brick Moulds this Year will meet your approval. ORDER A SAMPLE SET.

The "MOCK"

ABSOLUTE DOUBLE-PRESS FORCE-FEED

Brick Machine.

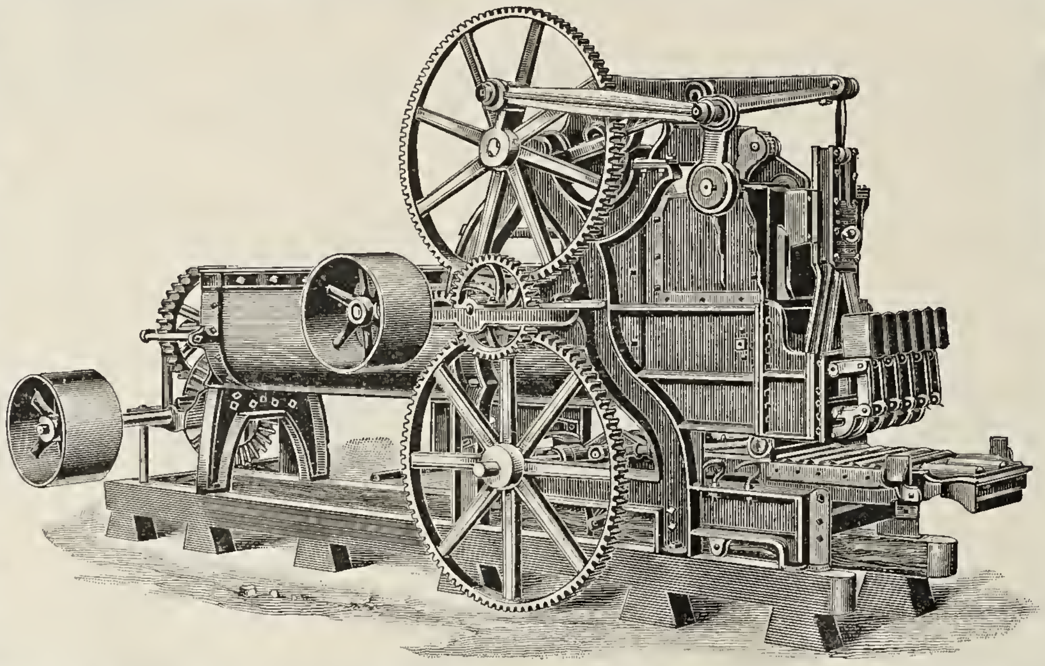
ALL IRON AND STEEL.

STRONG IN STRUCTURE.

Weight 16,000 Pounds. *LIGHT OF DRAFT.*

Time
Tested
Under all
Conditions.

**Built
to
Wear.**



Original in
Design.
Not
Conventional.

**Built
to
Last.**

The "MOCK" Patented Portable Rack and Pallet System.

No expensive Cars. No Wheel-Barrows. No abusive handling of brick by hand. Easy, Safe and Economical. Less labor and more profits.

Our Drying System is Peculiar,

For Sun and Air, or Artificial.

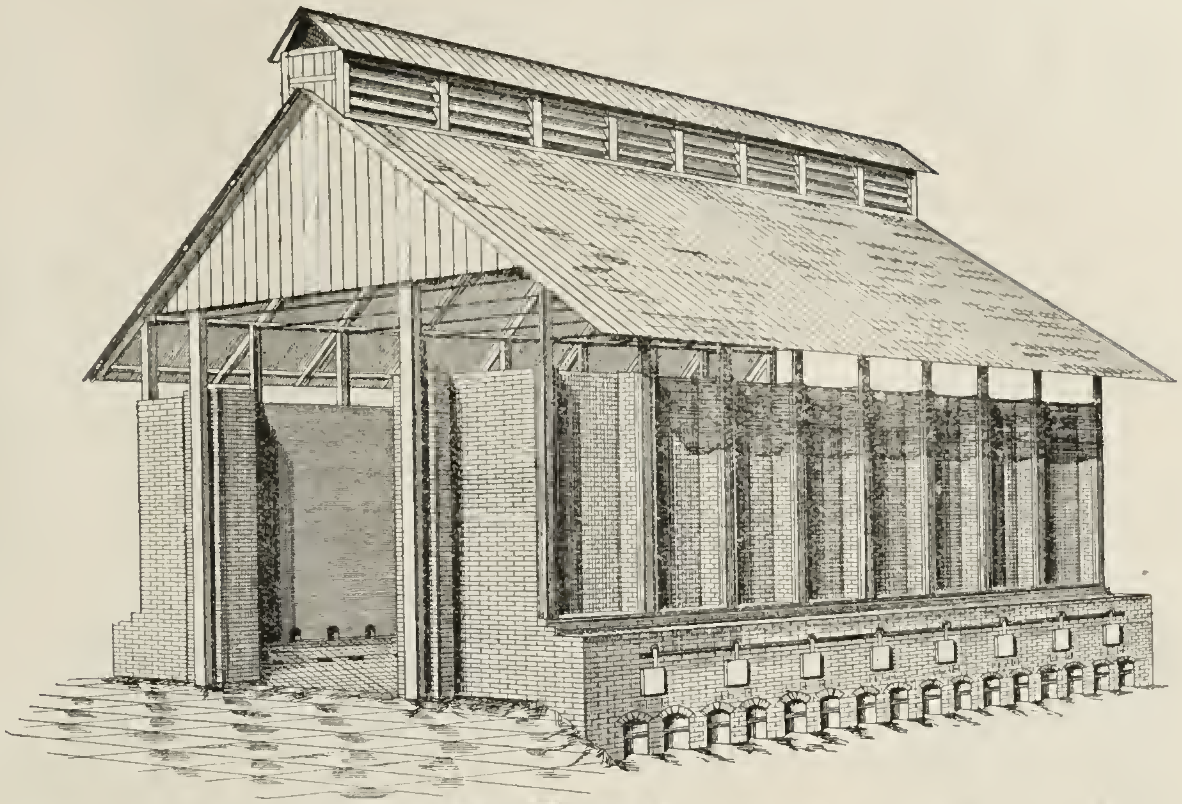
JAS. F. MOCK & CO.,

Write for our 1900 Catalogue. HARTFORD CITY, IND.

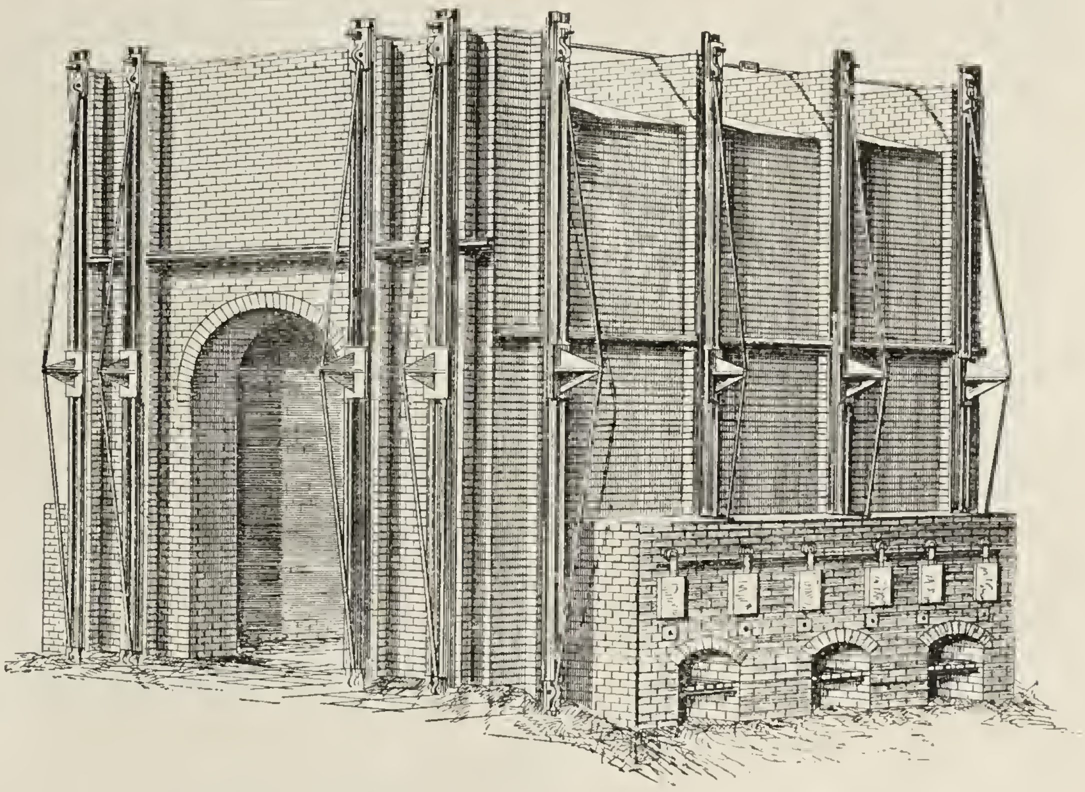
The Grath

IMPROVED...

Up and Down Draft Kilns



With Gas and Coking Furnaces Attached, for burning all kinds of Brick, Tile, Sewer Pipe, etc., using nothing but **Cheapest Slack Coal.**



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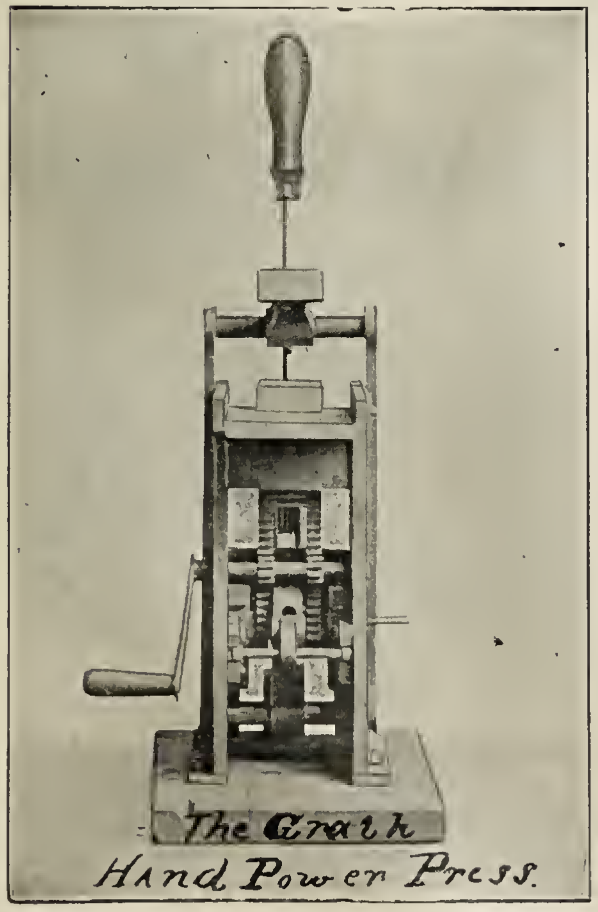
The Grath Slack Coal Gas and Coking Furnaces

Can be attached to **any** style kiln and is the **only** Coking Furnace which **cokes all** the slack, produces more **heat** and less smoke than any other Coking Furnaces and uses less fuel.

Simple and Durable.



The Grath Dry or Semi-Dry Clay Hand-Power Press

For plain or ornamental press brick, The only successful press of its kind in the market. Simple, durable and powerful. No brickyard complete without this press.

* *

The Grath Brick Grinding Machine

For grinding Arch and Radius Brick of any hardness, even to a Vitrified brick. Simplest and Best in the market. No sand, no discoloration, which means satisfaction.

The Cheapest Grinding machine in the market

In use by American Hydraulic Press Brick Co., Collinsville, Ill.

FOR FURTHER INFORMATION ON ABOVE, ADDRESS

Mention the CLAY-WORKER.

The Illinois Supply & Construction Co., St. Louis, Mo.

STEVENSON & CO.,

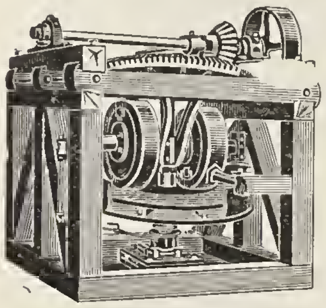
WELLSVILLE,
OHIO, U. S. A.

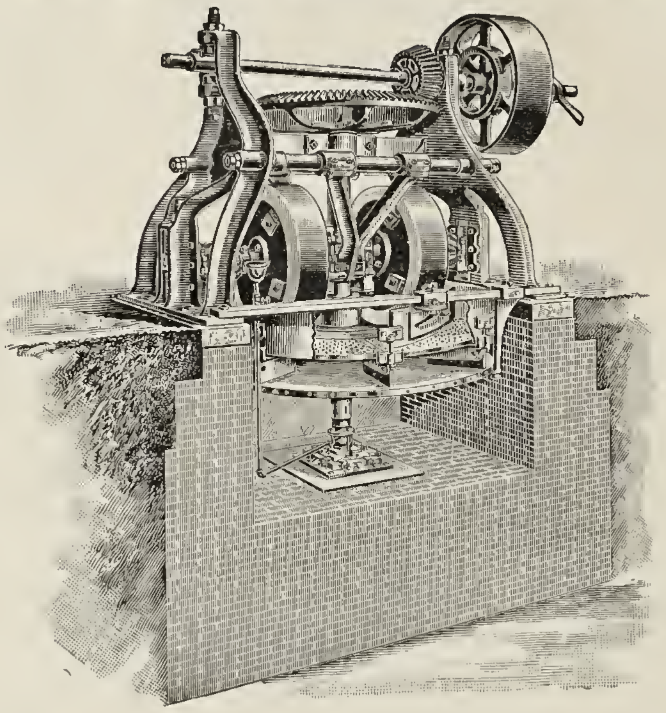
MANUFACTURERS OF

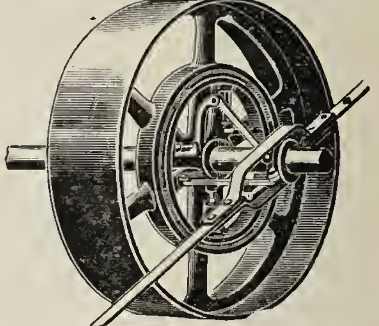
Brick Machinery.

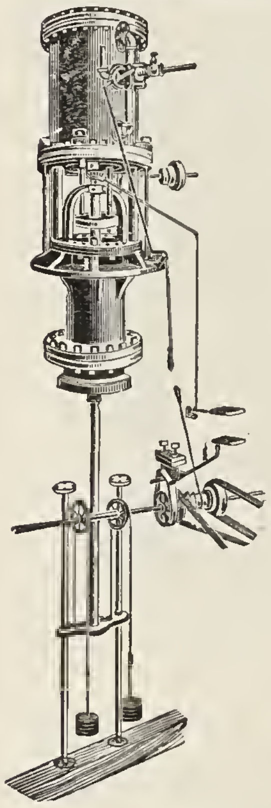
COMPLETE EQUIPMENTS.

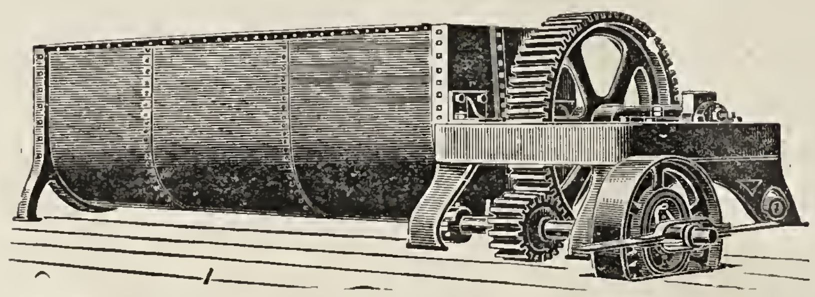
Tile Machinery

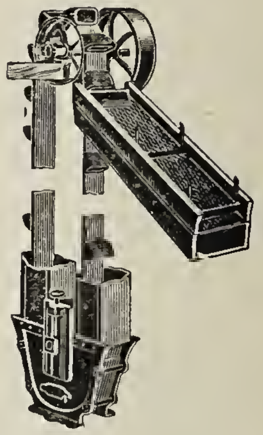








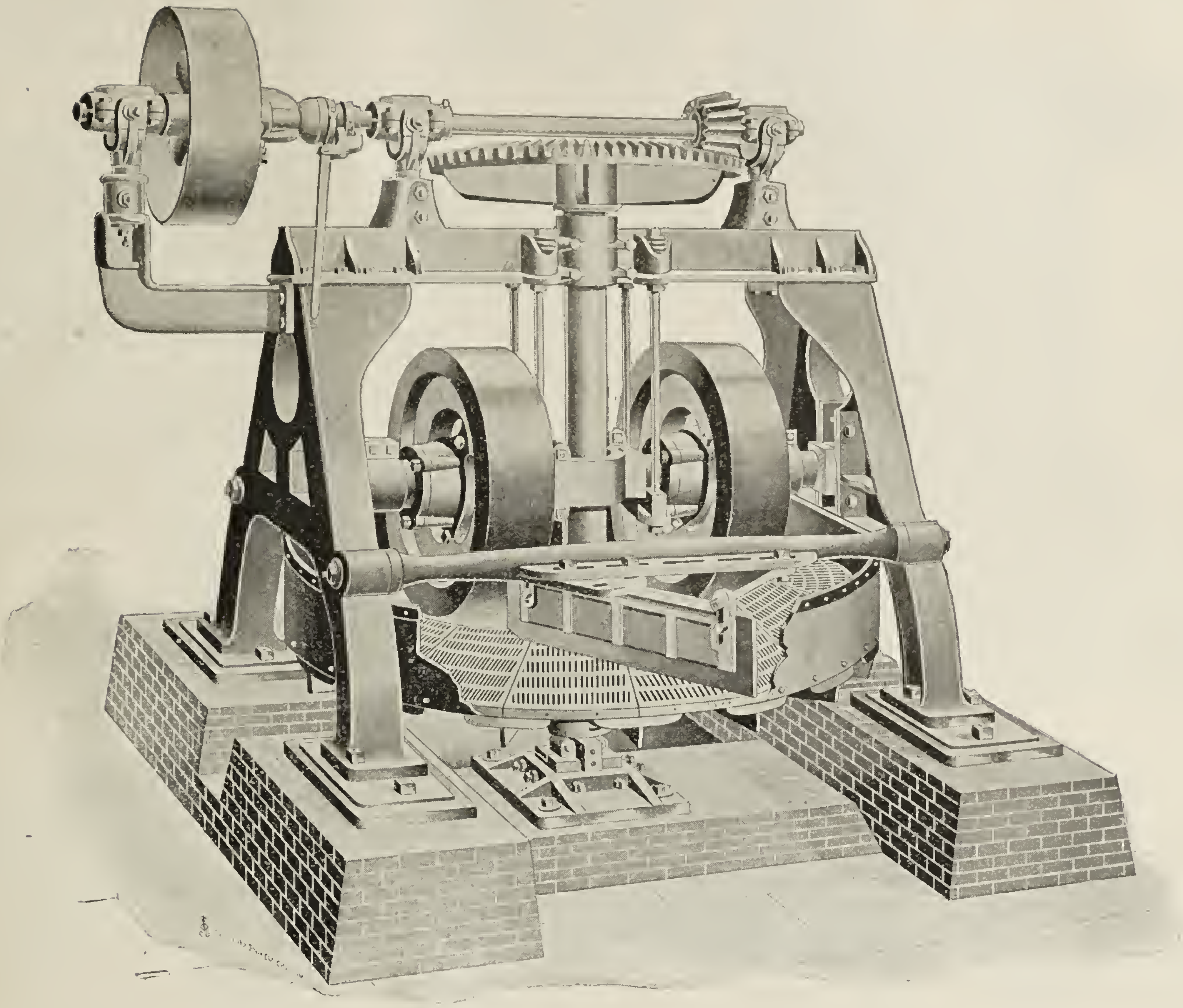




Equipments for Sewer Pipe, Terra Cotta, Brick and Tile Factories, Steam Sewer Pipe Presses, Terra Cotta and Sewer Pipe Dies, Dry Grinding Pans, Tempering Pans, Pug Mills. Elevators for Brick, Pipes, Clay and Trucks. Engines, Boilers, Heaters, Pumps and all Pipe Fittings and Fixtures for Steam Equipments. Shafting, Bearings, Plain Iron, Friction Clutch and Wood Split Pulleys. . . .

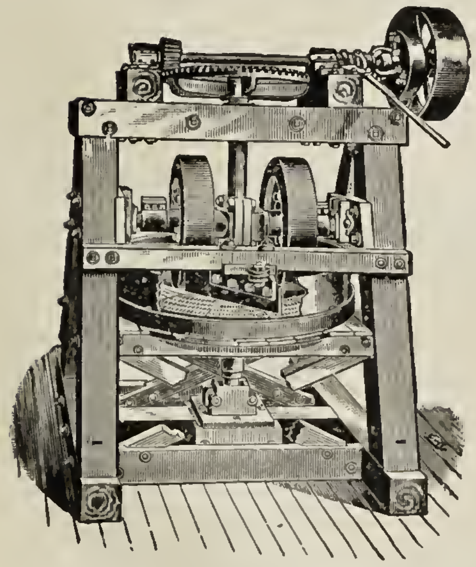
NEW CATALOGUE NOW READY.

STEVENSON & CO., Wellsville, Ohio.



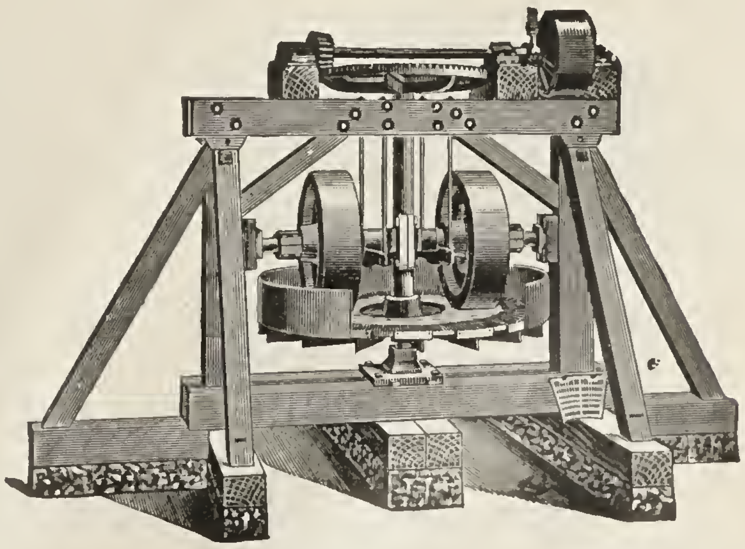
OUR SPECIALTY IS

DRY PANS.



IRON FRAMES,
WOOD FRAMES.

All Sizes and Price
to suit
Any Size Plant.



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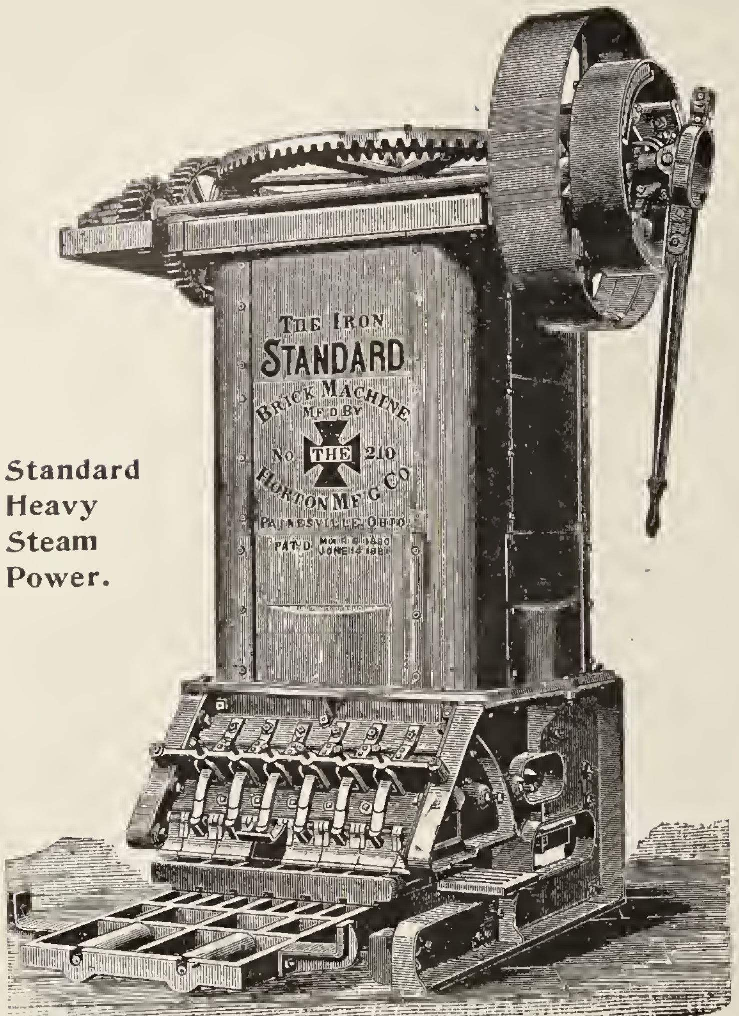
We Lead! Others Follow!



Standard Heavy Steam Power.

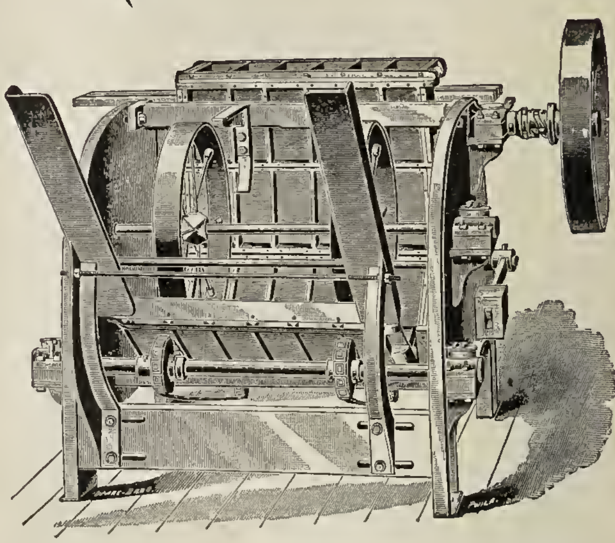
• • •

The Hercules!

Is simple in construction, powerful in operation, and practically non-breakable, cannot fail to lead the procession.

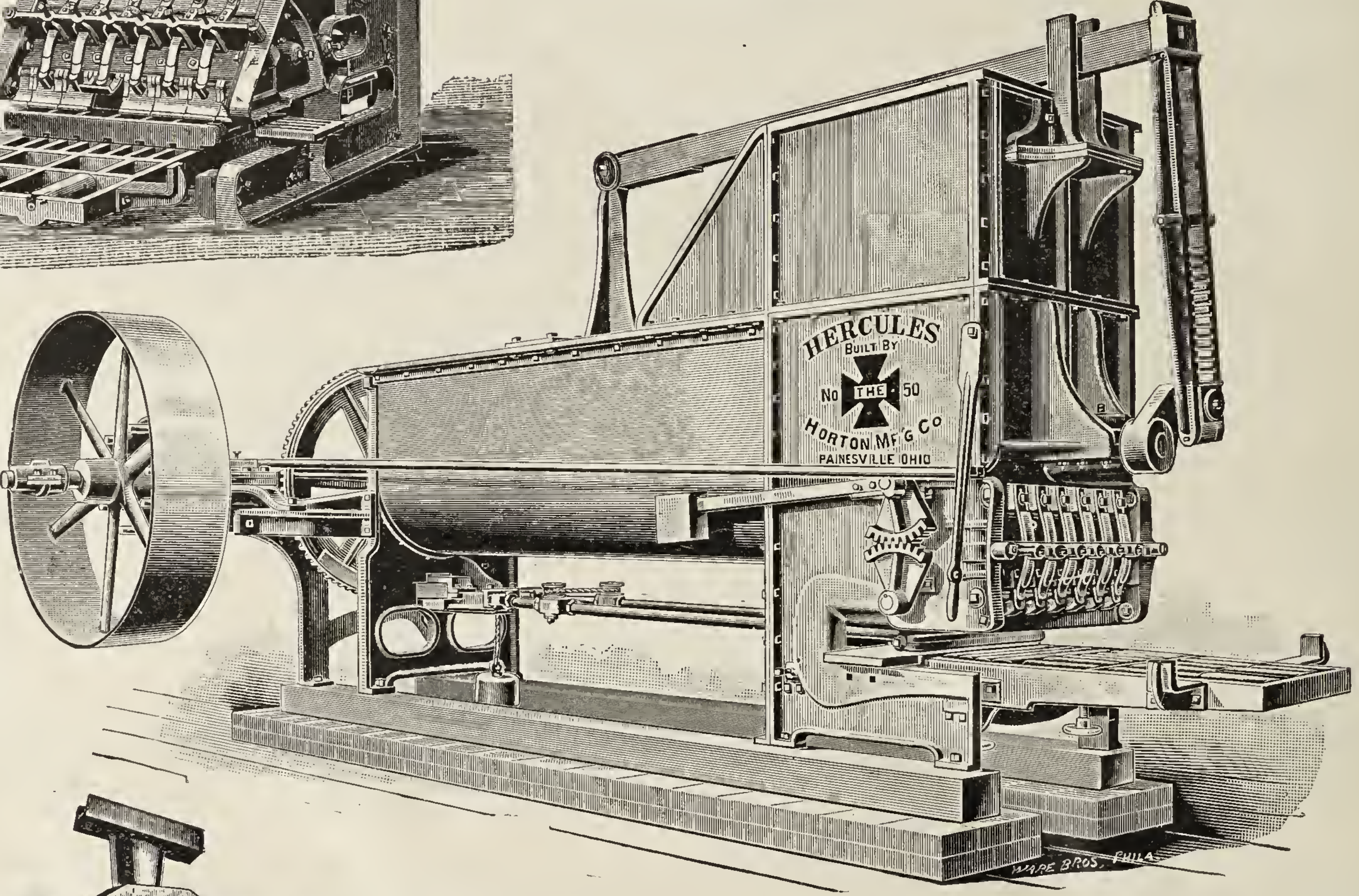
The Standard Machine is just what its name implies.

SEND FOR
1899 CATALOGUE.

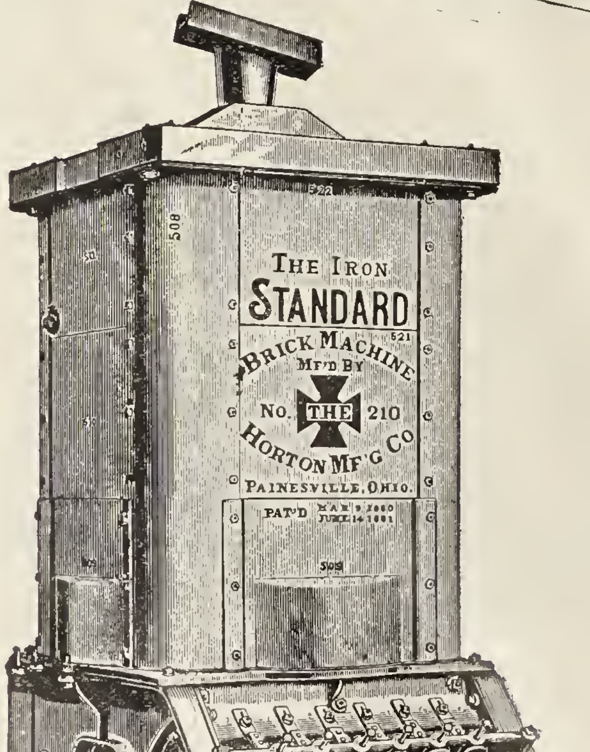


HORTON MOLD SANDER DIRECT FEED.

Hercules capacity 40,000 to 50.000. Weight 15,000 pounds.



We are making a special drive on Molds this season. Send for our new circular on molds

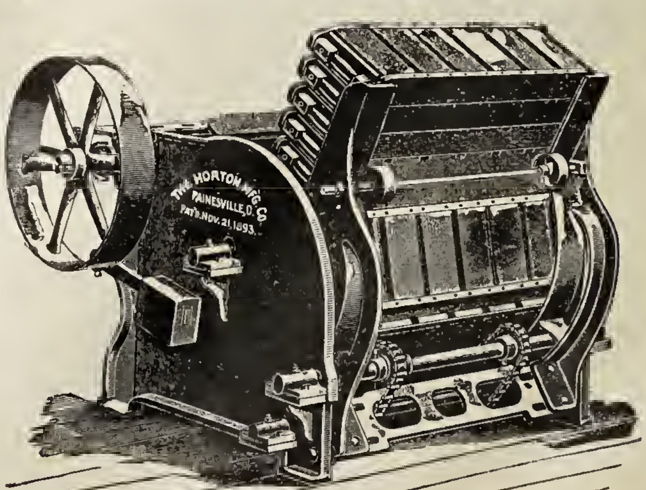


IRON STANDARD HORSE POWER.

WE HAVE recently added to our plant a complete line of special wood working machinery for the manufacture of molds, trucks, barrows and other brickyard supplies. We carry a large stock of standard molds and can make any special size within a very short time after receipt of order.

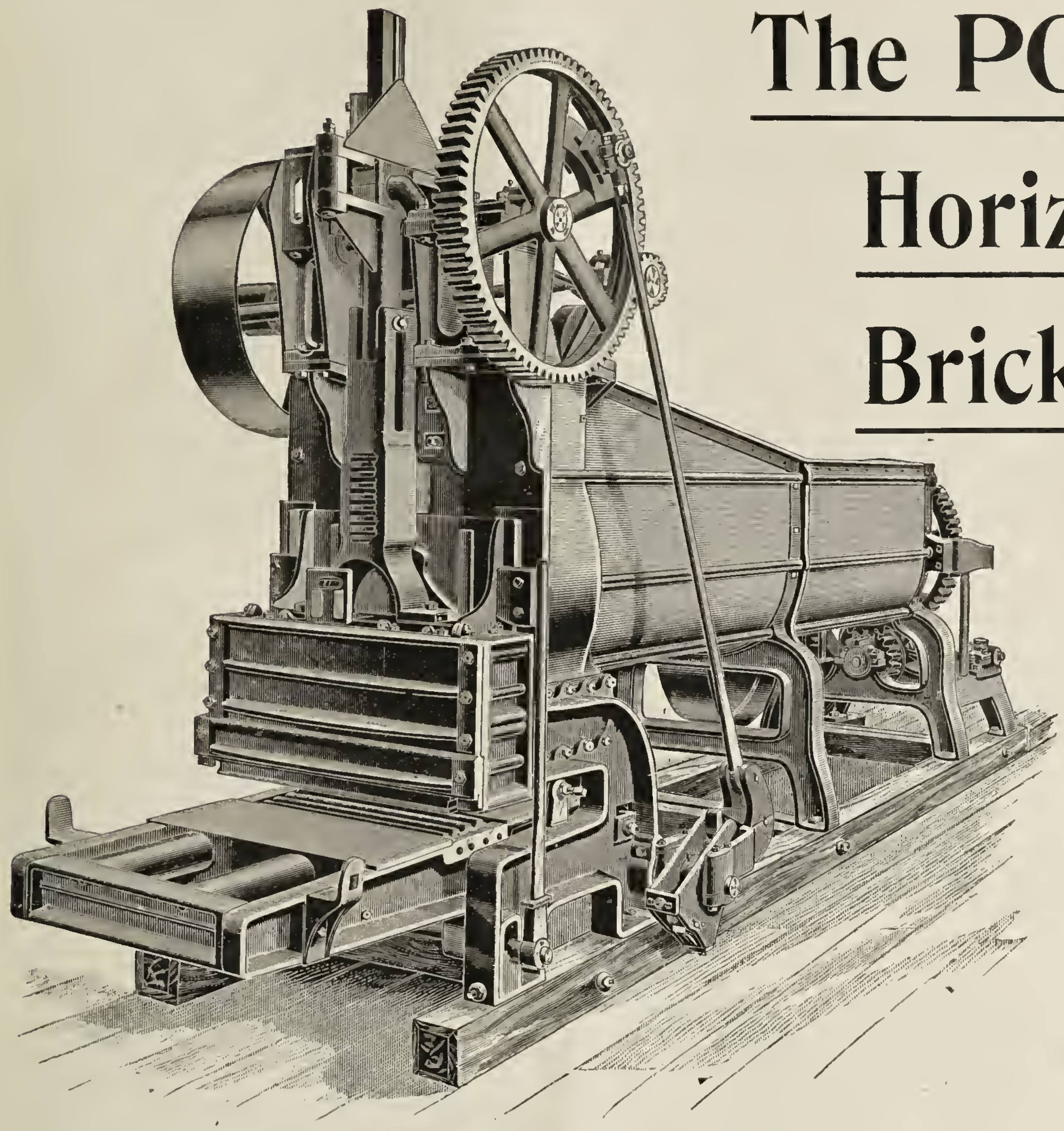
The HORTON MANUFACTURING COMPANY,

PAINESVILLE,
OHIO.


The Horton Mf'g Co.
Painesville, O.
Pat'd Nov. 21, 1893.

THE AUTOMATIC FEED MOLD SANDER.

We make a Specialty of erecting Complete Soft Mud Plants.



The POTTS Horizontal Brick Machines,

DISINTEGRATORS

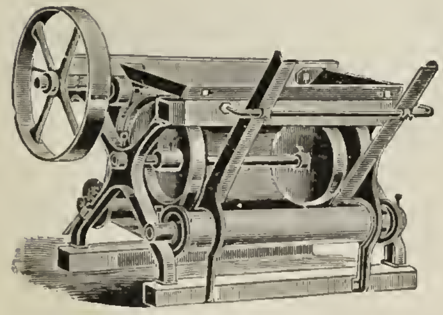
....AND....

MOULD SANDERS

Make a complete outfit, which will work the clay direct from the bank.

They will make brick which have **clean, sharp corners** and smooth surfaces. Brick which will be straight and square.

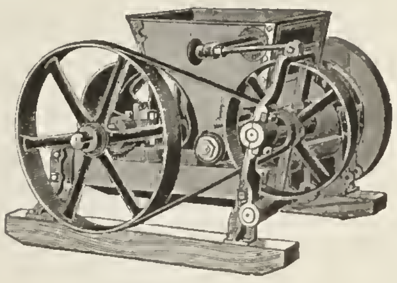
The best built, heaviest and strongest Machinery made.



MOULD SANDERS.

WE MANUFACTURE EVERYTHING NEEDED ON THE BRICKYARD.

WE MAKE A SPECIALTY OF BRICK MOULDS.



DISINTEGRATORS.

When in need of Machinery or supplies, we can save you money.

C. & A. POTTS & CO.,

WRITE FOR OUR NEW CATALOGUE
JUST FROM THE PRINTERS.

INDIANAPOLIS, IND.

**BUILT RIGHT
RUN RIGHT.**

It's Not the Name

That makes the fame, but the continued successful operation of the machine.

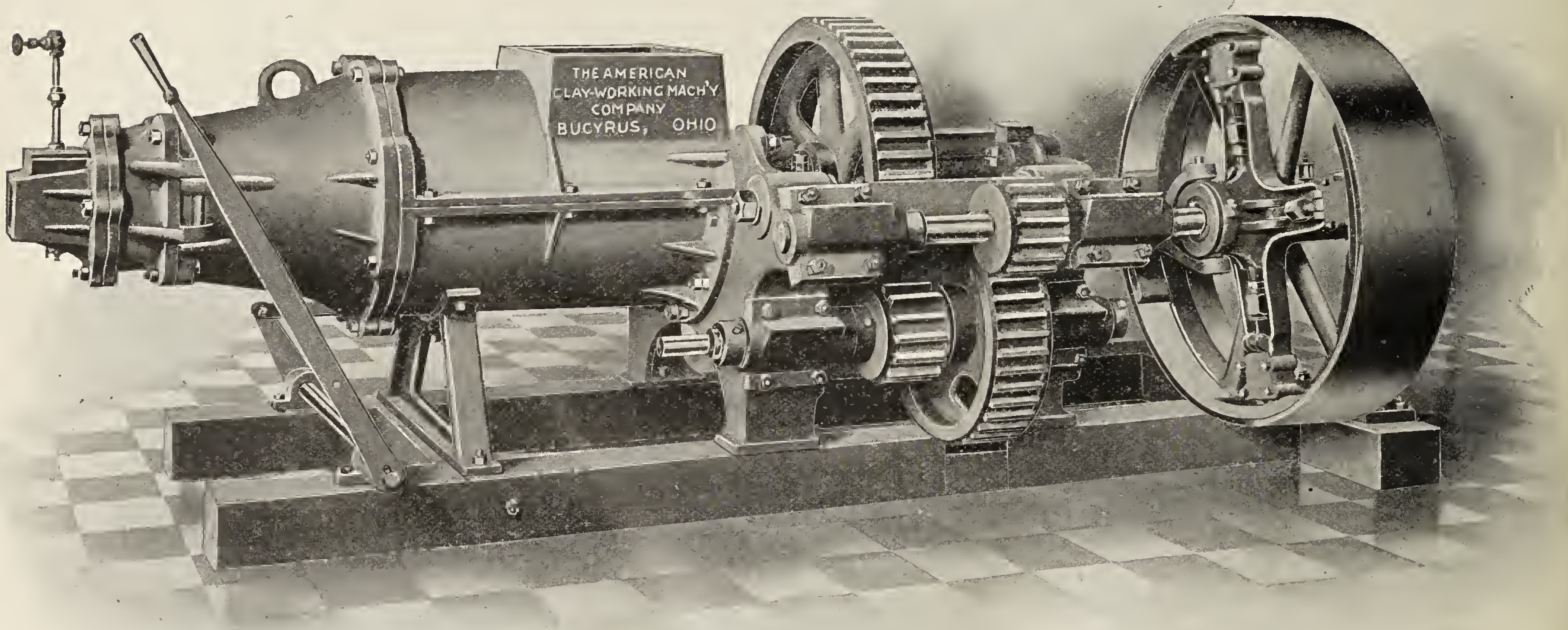
NO AUGER MACHINE has a record that will approach that of the No. 2 Giant. It has by long and faithful use, under the most exacting conditions, won for itself a name and a reputation which is enviable. Manufacturers who have had but indifferent success with other machines have placed a handsome balance on the right side of the ledger by installing the No. 2 Giant. Other machines may turn out as much product in an hour, but it will not last or compare in quality, and quantity without quality ruins instead of makes the reputation of the clay manufacturer. You may as well secure both quantity and quality. It costs no more and when you take into consideration the freedom from delays and repairs you will find the Giant cheaper by far.

Owners of this machine are universal in their praise of it. A prominent manufacturer of the South writes as follows:

> "We are enlarging our plant to take care of the brick as fast as the No. 2 Giant will turn them out. It does more than you claimed for it. If you had made your claim higher, we would have arranged from the first to take care of more brick."

This firm was evidently provoked that we had not made more of a claim for this machine. Our policy is to exceed what we promise, then there are no disappointments.

Send for particulars on the Giant machine; we make them in three sizes. If you are in the market for any clay-working machinery or supplies it will pay you to write us regarding your wants. Drop us a postal and you'll receive a prompt reply.



THE MACHINERY THAT NEVER DISAPPOINTS

The American Clay-Working Machinery Co.,

BUCYRUS, OHIO.

JULY 4,
1859.

FORTY
YEARS OF
SUCCESS!

H. BREWER & CO.,
TECUMSEH, MICH.

WIRE CUT and MOLD PRESS,
Brick Machines.

Best
Tile
Machines
IN
America.

Milledgeville, Ga., May 16, 1899.

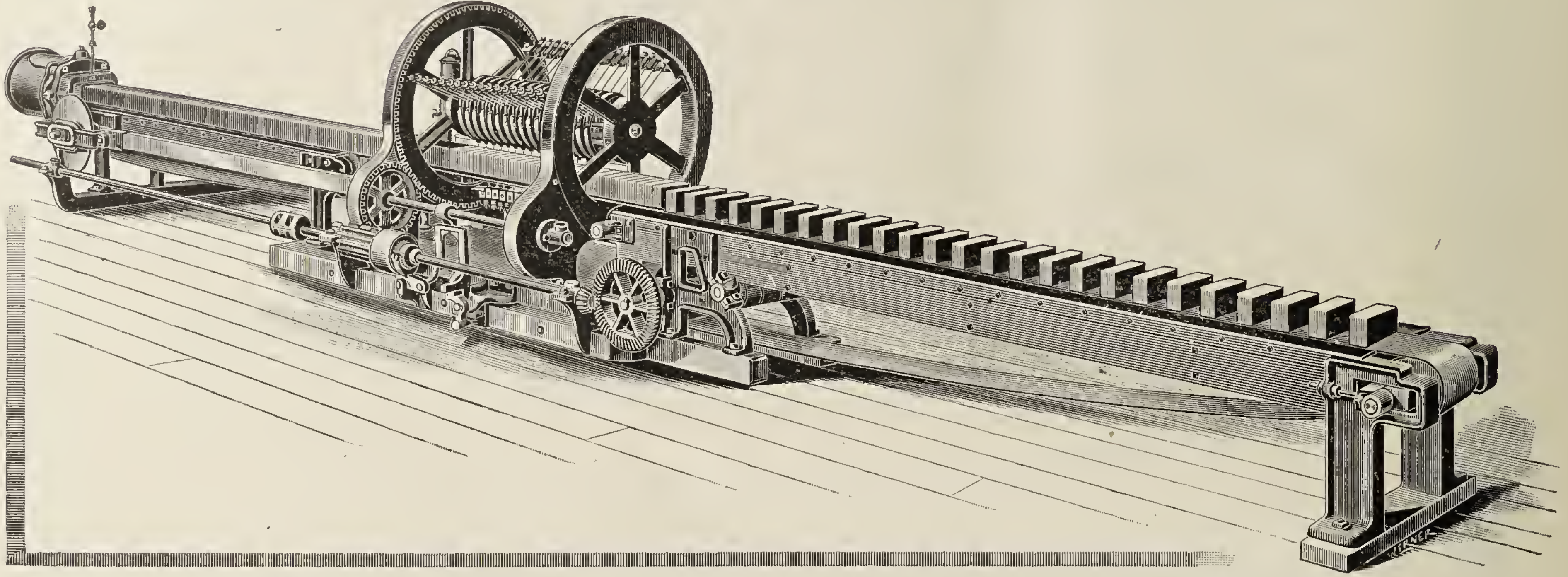
MESSRS. H. BREWER & CO.,

I was raised at the brick business, and my father before me. Have been to many brickyards in different parts of America and in the old country, and have never seen a brick machine that makes as nice and good brick from stiff clay as your No. 12 Mold Machine. I have worked wire cut machinery for 18 years, and made brick as good as were demanded, but your No. 12 Mold Machine for the clay I am now working makes finer brick than I ever made on a wire cut.

Very respectfully,
J. W. McMILLEN.

FINALLY

**Side Cut Brick
Automatically Cut
With SMOOTH EDGES.**



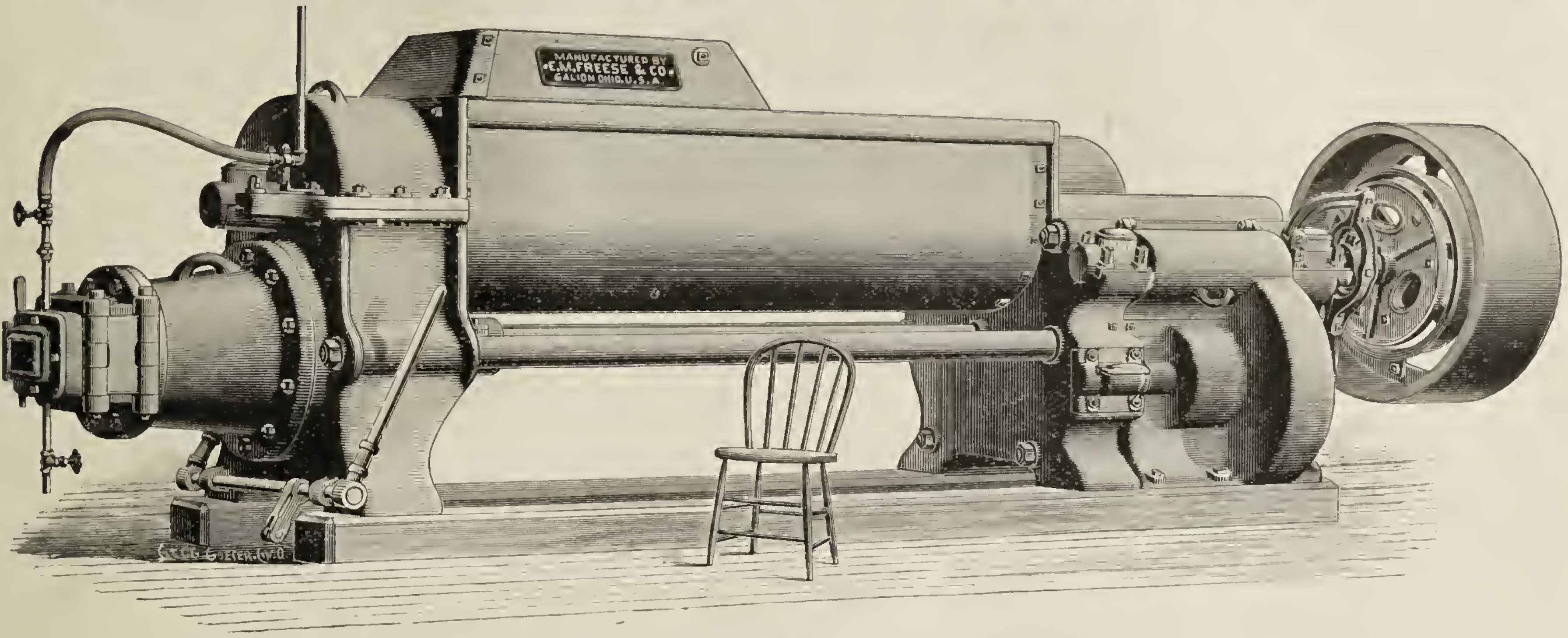
A New Rotating Cutter for Side Cut Brick.

POINTS.

Of simplest construction. Entirely automatic and positive in operation.
A combined downward and lateral movement of the wires insures brick with **smooth edges.**
The cut is always in the same direction, therefore only one side or thrust bar is used. Consequently column of clay cannot become wedged, or be moved from side to side.
Cutting wires are short and make a square and straight cut.
New wires easily put on without stopping, stooping or poking end of wire through a hole.
More than twice as much time is afforded for renewing wires as in other cutters.
Movement of all parts is slow.
Clay does not propel cutting wires.
No auxiliary or friction belts used.
No tensions to regulate.
No regulation or adjustment required.
No crank or pitman rod used.
No reciprocating wire frame used.
No machinery underneath.
Absence of all complicated gearing.
Cannot miss a cut or cut a crooked brick
All the brick are of the same thickness.
Substantial and durable in all parts.
Capacity ample for any brick machine.

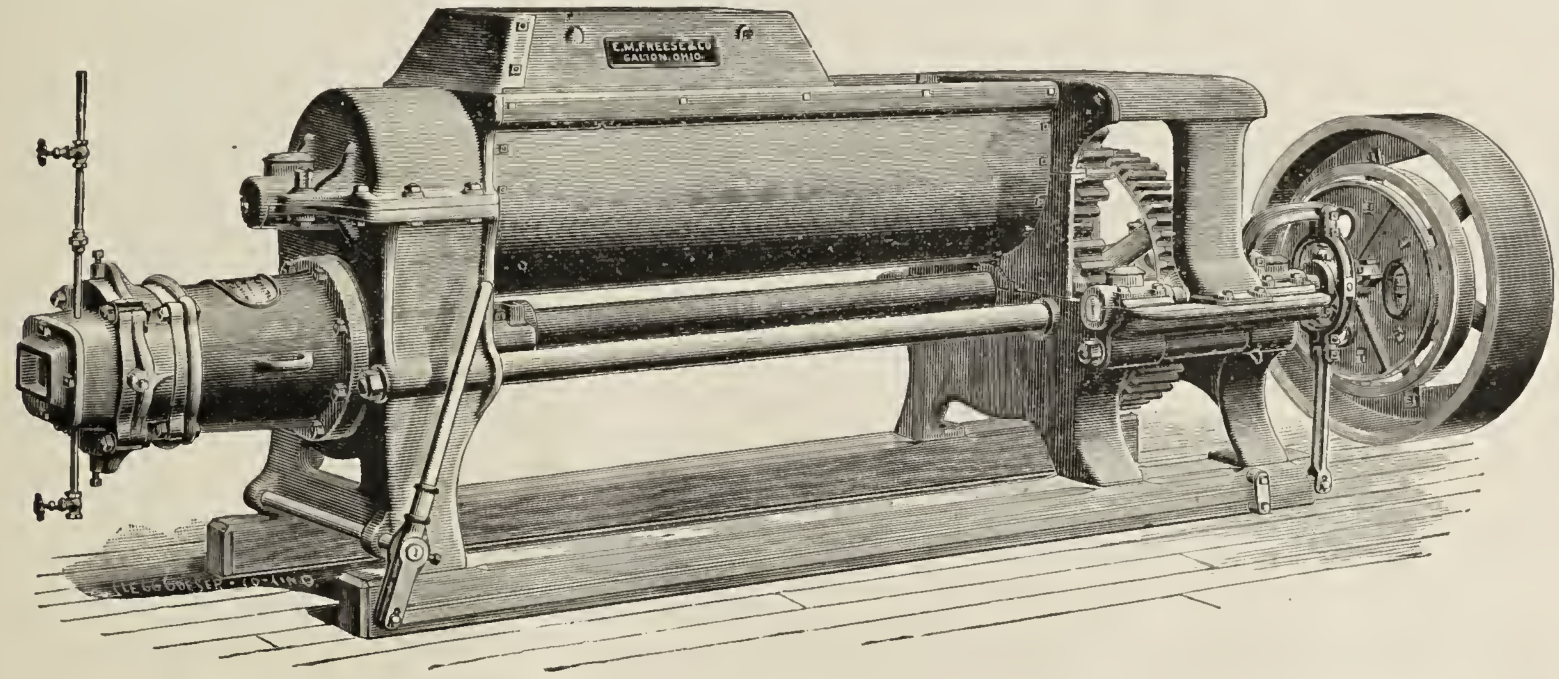
E. M. FREESE & CO.,
Galion, Ohio.

The Original Union Brick Machines


MANUFACTURED BY
E.M. FREESE & CO.
GALION OHIO U.S.A.

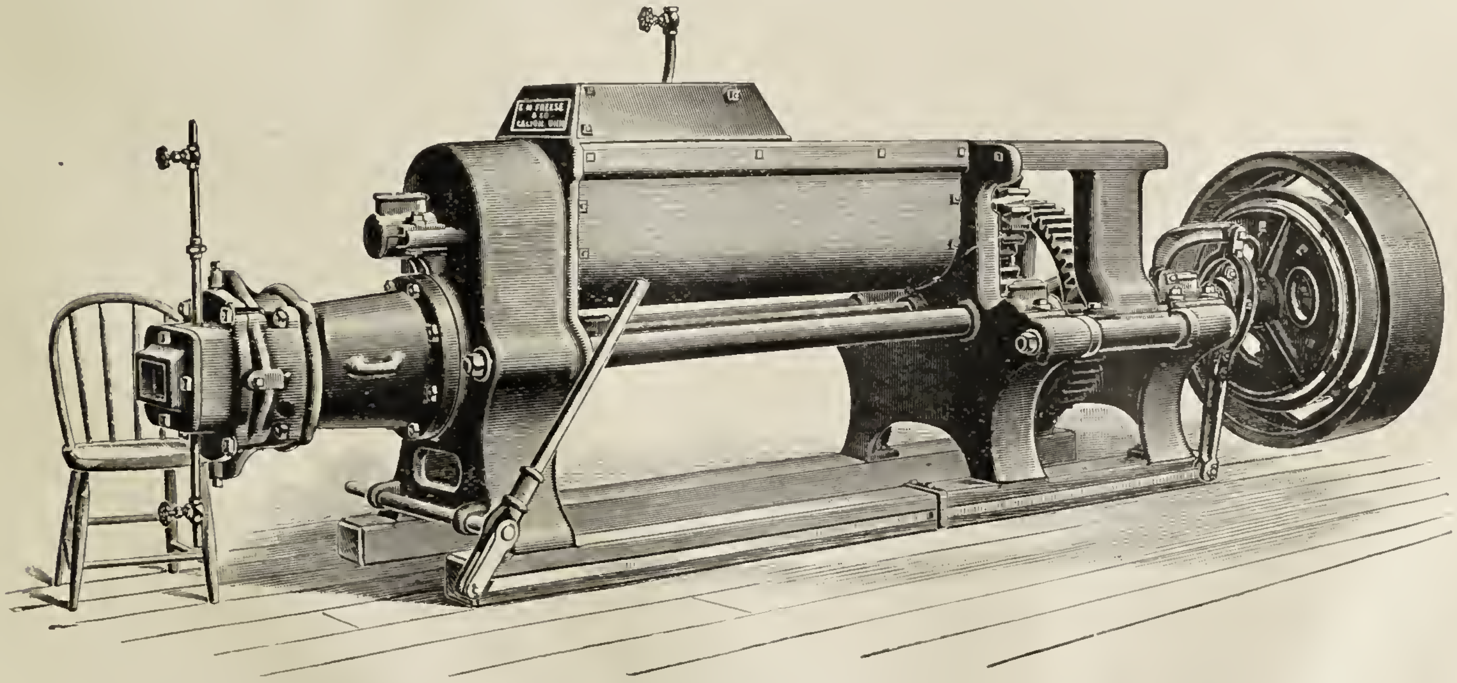
SPECIAL SIZE.

Daily capacity 40,000 to 70,000 Brick; Length 23 feet; Height to top of Pug Mill 5 feet 4 inches; Weight complete 23,000 pounds.



No. 1 SIZE.

Daily capacity 20,000 to 40,000 brick; Length 16 ft. 6 inches; Height to top of Pug Mill 4 feet 8 inches; Weight complete 12,000 pounds.



No. 2 SIZE.

Daily capacity 15,000 to 25,000 brick; Length 15 feet; Height to top of Pug Mill 4 feet; Weight complete 8,000 pounds.

These Machines are NOT an experiment.

They are used in fifteen States.

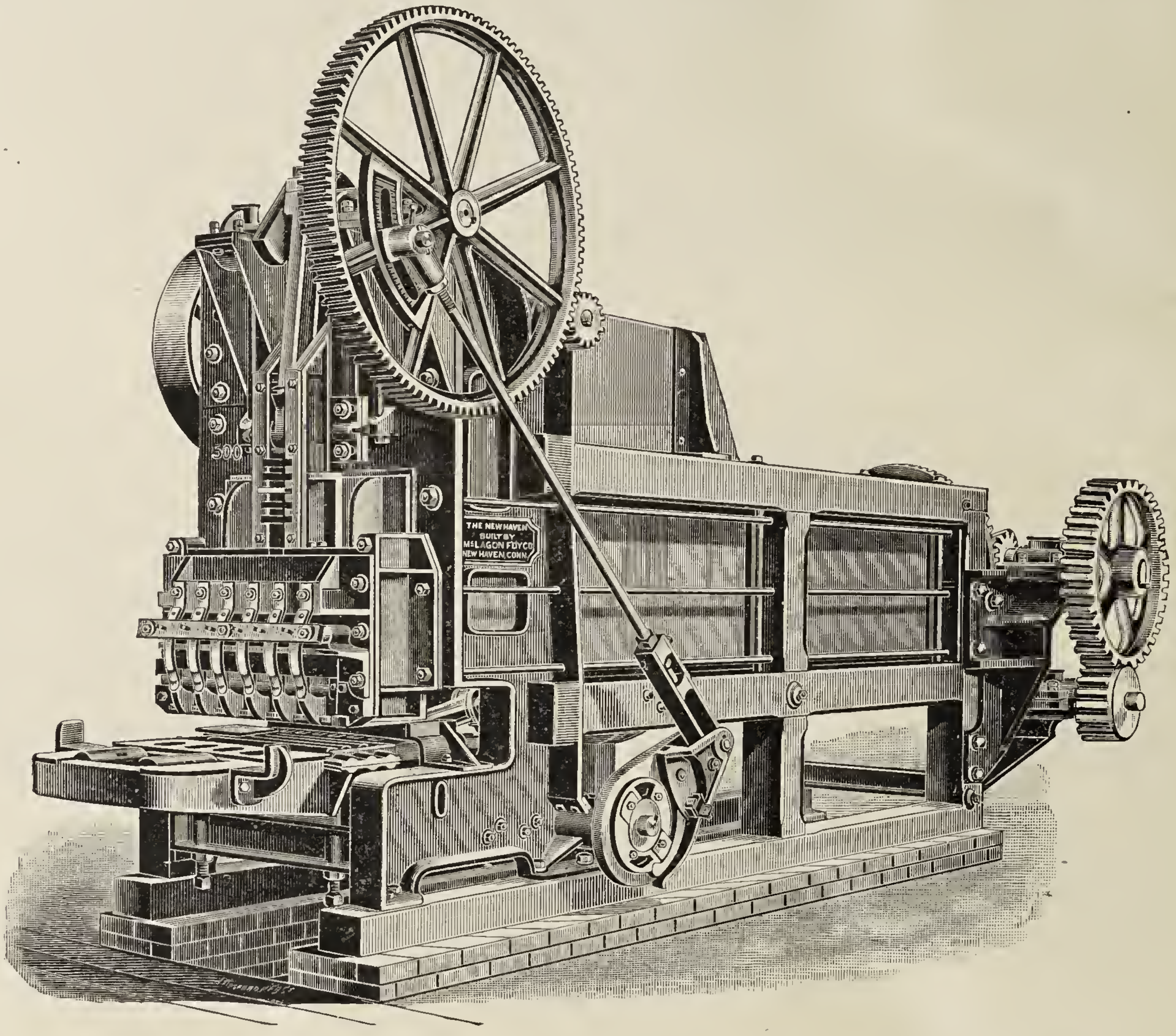
They are a SUCCESS Investigate them.

No separate Pug Mill required.

E. M. FREESE & CO., Galion, Ohio.

One Million Brick a Month The Year Through.

To Make Soft Clay Brick at that Rate the Machine Cannot be Idle Because of Breakages very much of the Time.



Mechanicville, N. Y., Nov. 11th, 1899.

The EASTERN MACHINERY CO., New Haven, Conn.

Gentlemen:—Replying to your letter regarding the running of the **"NEW HAVEN" Machines**, we will not take much room in your catalogue to say all that we have to about them.

We started the first machine March 21st, '98, and have made on that machine to date **Twenty Millions of Brick, which is practically one million a month the year through. The other machine is doing the same amount and has the possibilities of same record.** Machines that will do that amount of work are good enough for us.

Yours very truly, BEST BRICK CO.,
W. N. CAREY, Sec'y.

PERHAPS YOU MAY BE LOOKING FOR A MACHINE OF THIS KIND.
AT ANY RATE WE WILL BE GLAD TO HAVE YOU INQUIRE ABOUT THEM.

The Eastern Machinery Co.,

NEW HAVEN, CONN.

DO YOU WANT THE

BEST BRICK DRYER?

The CUMMER DRYER is sold under a positive guarantee, and Our Guarantee is Good.

We are prepared to demonstrate that **The Cummer** system is the most economical in the use of fuel. It is a fuel saver and hence a money maker.

If you want the best and most economical brick dryer don't fail to get our prices. If you want a cheap dryer, its no use to write us for we don't build that kind.

Read what H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE: 60TH AND HAVERFORD STS.
TELEPHONE 147, W. P.

H. C. CARROLL & SONS,

Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS:
57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

The Cummer Clay Dryer is now in successful operation at many places in the United States. Like our brick dryer it is fully guaranteed to perform its work in the most effective manner possible and in any desired capacity. The **Cummer Dryer** succeeds where others fail. It will afford us pleasure to demonstrate its superiority over all other dryers.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell you troubles to"

The F. D. CUMMER & SON CO.,

CLEVELAND, OHIO.

THE "ABC" BRICK DRYER

"ABC" "ABC" "ABC" "ABC"

"ABC" "ABC" "ABC"

"ABC" "ABC" "ABC"

"ABC" "ABC" "ABC" "ABC"

The "A B C" BRICK DRYER
Dries Brick Thoroughly.
The "A B C" BRICK DRYER
Dries Brick Quickly.
The "A B C" BRICK DRYER
Dries Brick Economically.

For Further Information, Catalogue, Etc., Address

American Blower Co.,
DETROIT, MICH.
NEW YORK. CHICAGO. LONDON, ENG.

THE "ABC" BRICK DRYER

The Turner, Vaughn & Taylor Co.,
CUYAHOGA FALLS, OHIO, U. S. A.

MANUFACTURERS OF ALL KINDS OF

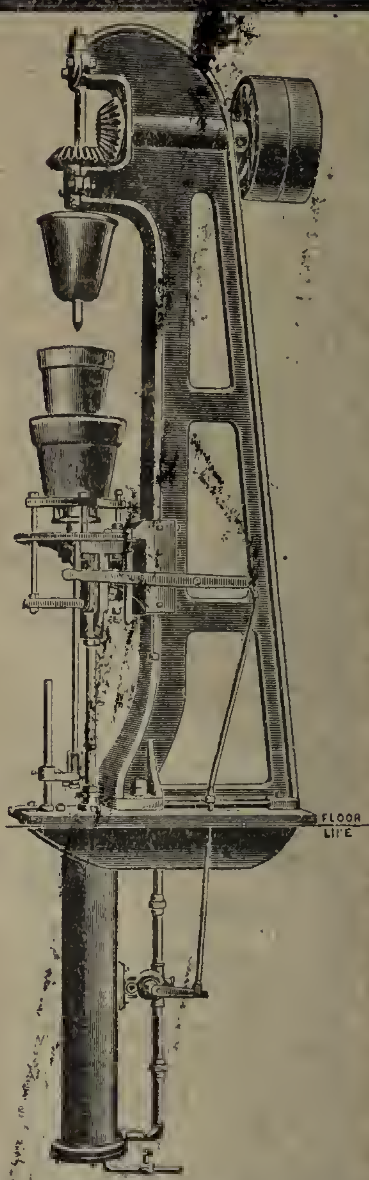
Clayworking Machinery.

The accompanying cut shows our improved machine for making

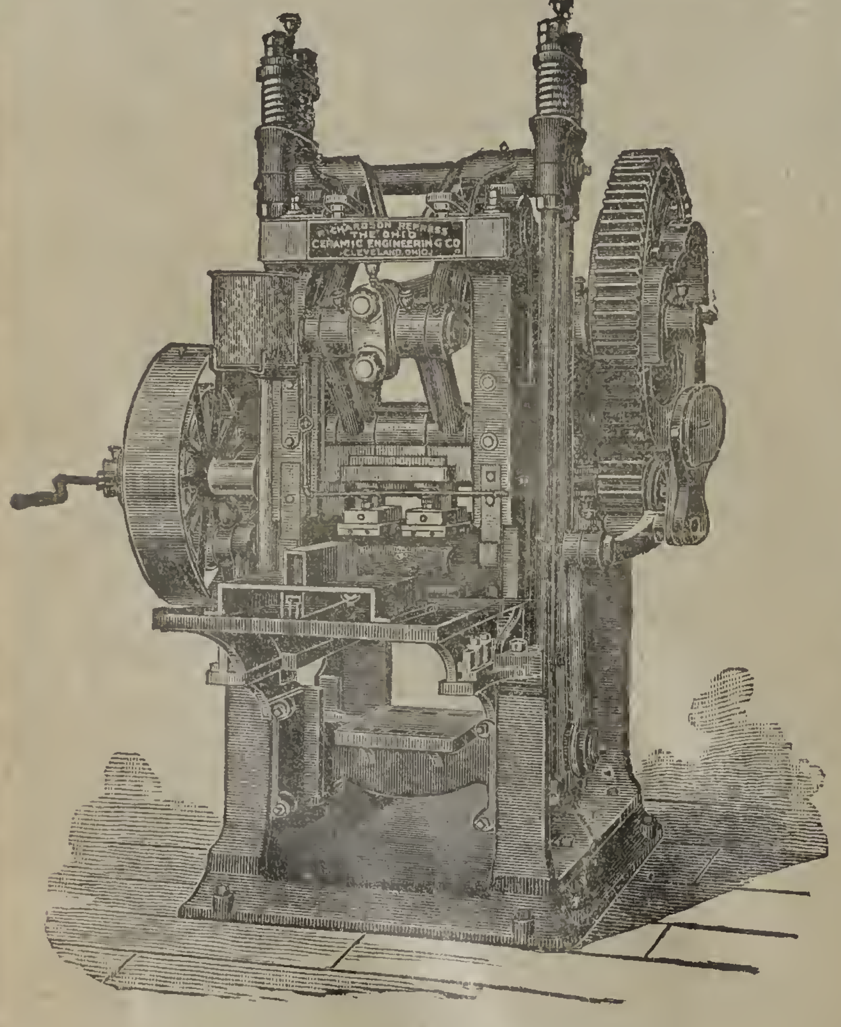
Bessemer Converter Nozzles, Sleeves, Runner Brick, Bowls and FLOWER POTS of ALL SIZES.

We also make the BEST

SEWER PIPE PRESSES,
GRINDING PANS (Wet and Dry.)
PUG MILLS, Etc., Etc.



DONT FAIL to get OUR PRICES if you want the BEST MACHINERY.



THE RICHARDSON REPRESS.

N. B.--We carry a full line of Repairs for the SWORD BRICK MACHINE.

New Years Resolutions

Are of no value unless you practice them. You may resolve to

Make Money

During the year of 1900 but you can't do it unless you have Modern Machinery. Send for our Catalogue.

The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

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